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патентов США (1976-2018)
(Категория "surface")

"Methods and systems for semi-autonomous vehicular convoys"

The present invention relates to a method and system for enabling vehicles to closely follow one another through partial automation. Following closely behind another vehicle can have significant fuel savings benefits, but is unsafe when done manually by the driver. By directly commanding the engine torque and braking of the following vehicle while controlling the gap between vehicles using a sensor system, and additionally using a communication link between vehicles that allows information about vehicle actions, such as braking events, to be anticipated by the following vehicle, a Semi-Autonomous Vehicular Convoying System that enables vehicles to follow closely together in a safe, efficient and convenient manner may be achieved. [A1]

"Pre-warning method and vehicle radar system"

A pre-warning method utilized in a vehicle radar system includes a first and a second millimeter-wave detection modules detecting dynamic information of a plurality of first targets and a plurality of second targets corresponding to the vehicle radar system in different dimensions of an area and obtaining a first and a second detection results, determining whether there are identical targets within the plurality of first targets and the plurality of second targets according to the first and the second detection results, determining 3-D dynamic information of at least an identical target after determining that the plurality of first targets and the plurality of second targets include the at least an identical target, and determining whether to trigger an alarm signal according to the 3-D dynamic information of the at least an identical target. [A2]

"USB/Wireless based traffic radar system"

A traffic radar system utilizes a standard USB interface of power and communication to a host USB device. Modules of the radar system communicate over a wireless network to reduce hard-wire cabling in the patrol vehicle or radar platform. Digital signal processing (DSP) is utilized in a distributed processing architecture to increase processing functionality and target detection capabilities. The system modules incorporate electrical and mechanical interfaces which allow modules to be connected together to form unique radar systems. [A3]

"System and method for detecting blockage in an automotive radar"

A radar sensor for use within a vehicle includes blockage detection functionality. In at least one embodiment, the radar sensor collects information on stationary infrastructure around the vehicle. The infrastructure information may be used to generate a Doppler Monopulse Image (DMI) or other graph for the sensor. A clutter ridge within the DMI or other graph may be analyzed determine a blockage condition of the sensor (i.e., unblocked, partially blocked, or fully blocked) . [A4]

"Flow meter with adaptable beam characteristics"

An embodiment provides a device for measuring a fluid parameter of fluid flow in a channel, including: a transmitter, at least one receiver, a processor operatively coupled to the at least one transmitter and the at least one receiver, a memory device that stores instructions executable by the processor to: transmit, using the transmitter, directed energy carrying a signal toward a surface of a fluid in a fluid channel, so as to produce one or more reflections from the fluid surface, detect, by the at least one receiver, one or more received signals associated with the one or more reflections so produced, determine, based upon a measurement beam comprising characteristics of the transmitted and received signals, one or more fluid parameters to be measured using a processor of the device, and associate, using a processor of the device, the one or more fluid parameters with a channel segment. Other embodiments are described and claimed. [A5]

"Systems and methods for walking pets"

Systems and methods are provided for guiding a target object with an unmanned aerial vehicle (UAV) in an environment. The UAV may be able to recognize and locate the target object. The UAV can be configured to communicate the actions and behavior of the target object to a user through a user device in communication with the UAV. The UAV can provide positive and negative stimuli to the target object to encourage an action or behavior. The UAV can be configured to recognize and manage waste generated by the target object. [A6]

"Terminal positioning"

In this example, a method and an AP for positioning a terminal are provided. and wherein, when receiving a probe request sent by a terminal, the AP determines whether the terminal is a non-associated terminal or not according to acquired terminal status information. When determining the terminal as a non-associated terminal, the AP may measure round trip time (RTT) for the terminal. The AP may send the measurement result to a server, so that the server may position the terminal according to the measurement result. [A7]

"Group for localizing a moving target in a warehouse with automatic guided vehicles"

The present invention relates to a localization or position estimation group for a moving target, such as a person or a manual guided vehicle, in a warehouse or in an area to be monitored with at least one automatic guided vehicle, equipped with a unit for controlling the movement of the automatic guided vehicle itself, and at least one moving target. [A8]

"Overhead object detection using optical measurements"

Technology is described for a height pole detection system for detecting a height of an overhead object from a moving vehicle. The height pole detection system can include a laser operable to emit a plurality of laser light pulses substantially upwards. The height pole detection system can include a laser light detector operable to detect one or more of the plurality of laser light pulses that are emitted from the laser and subsequently reflected from the overhead object. The height pole detection system can include an ambient light filter enclosure operable to partially surround the laser light detector. The ambient light filter enclosure can include an optical absorbing material for absorbing ambient light that is not reflected from the overhead object. The height pole detection system can enable detection of the height of the overhead objects based on a time of flight of detected laser light pulses. [A9]

"Controller to quickly raise and slowly lower an air dam"

A front air dam assembly for a vehicle includes a translatable front air deflecting panel for altering an airflow beneath the vehicle, a deploying mechanism for translating the front air deflecting panel between a raised position and one or more deployed positions, and a rapid raising mechanism for rapidly raising the front air deflecting panel from the one or more deployed positions. A controller in operative communication with the deploying mechanism and the rapid raising mechanism controls the operation thereof. At least one sensor is included for sending a signal indicative of a road or vehicle condition to the controller. A locking mechanism under the control of the controller is provided for locking the front air deflector panel in the raised or the one or more deployed position. [A10]

"Camera apparatus of vehicle"

A camera apparatus of a vehicle is disclosed. The camera apparatus is such that an image quality of an image can be adequately changed in response to brightness of an optical image of a subject to allow a driver to view a bright image even in the night, thereby preventing an accident and enabling a safe driving, a width of a maximally opened door of a vehicle and a width of a parking space are compared to allow a character of whether to park to be combined with an image of a subject and displayed, thereby enabling a driver to safely park the vehicle, and a driver can view a moving object or obstacle at the rear of a vehicle when the driver is driving the vehicle backward, thereby preventing an accident from happening. [A11]

"Retrofit wireless blind spot detection system"

A method and system for detecting an object in the "blind-spot" of a moving vehicle. The system can be user-installed to retrofit a vehicle, e.g., one that lacks a more complex, factory-installed blind-spot detection system. The invention thus provides an inexpensive and simplified vehicle safety enhancement. [A12]

"Method for selecting an optimized trajectory"

A method for generating a signal for transferring a partly or highly automated vehicle into a safe system state at a target site. First, a need to transfer the vehicle into a safe system state is ascertained. A vehicle state is then determined, the vehicle state encompassing the current vehicle position. At least one target site is ascertained. Travel trajectories are ascertained from the current vehicle position to the at least one target site. The travel trajectories are related. One of the travel trajectories is selected based on the rating that has been carried out. A signal is generated on the basis of the selected travel trajectory. [A13]

"Measuring system, measuring process, and non-transitory recording medium"

A measuring system includes a first measuring unit which measures an object in front of a moving body in a first measuring area, a second measuring unit which measures the object in a second measuring area, the second measuring area being different from the first measuring area, a determining unit which determines whether a movement of the object satisfies a predetermined condition based on a measuring result of the first measuring unit, and a controller which causes the second measuring unit to start measuring the object in response to an event in which the determining unit determines that the object satisfies the predetermined condition and at least part of the object deviates from the first measuring area. [A14]

"Accelerator engine, corresponding apparatus and method, for instance for anti-collision systems

for motor vehicles"

An accelerator device for use in generating a list of potential targets in a radar system, such as an anti-collision radar for a motor vehicle, may process radar data signals arranged in cells stored in a system memory. A cell under test in is identified as a potential target if the cell under test is a local peak over boundary cells and is higher than a certain threshold calculated by sorting range and velocity radar data signals arranged in windows. The cells identified as a potential target are sorted in a sorted list of potential targets. The accelerator device may include a double-buffering local memory for storing cell under test and boundary cell data, and a first and a second sorting unit for performing concurrent sorting of the radar data signals arranged in windows and the cells identified as a potential target in pipeline with accesses to the system memory. [A15]

"Method for determining the distance and relative speed of a remote object"

The invention relates to a method for determining the distance (R) and relative speed (v) of at least one object remote from an observation point, comprising the following method steps: continuous transmission of at least one first and one second electromagnetic signal in each case of a signal period (T.sub.chirp) from the observation point, the signals consist of signal portions (bursts) having a constant frequency and a predetermined equal duration, wherein the signal portions of a signal cover a predetermined modulation range by means of frequency steps, the signals are transmitted interlaced in that signal portions of the different signals follow one another in time, wherein a frequency hop occurs between the successive signal portions of different signals, receiving the signals reflected by the object as an echo signal and carrying out a mixed operation with the transmission signal for transformation of the received signal into the baseband in a common analog channel, carrying out an analog-to-digital conversion and sampling the received signal portions of the echo signals and extraction of at least one sampling value for each signal portion, separately evaluating the sampling values for the different echo signals of the different emitted signals by means of a Fourier transformation stage and determining the frequency of the peaks corresponding to signal portions and determining a phase difference between the echo signals of the transmitted signals, characterised in that the signal portions of the second signal (B) are transmitted by means of the same frequencies as corresponding signal portions of the first signal (A) . [A16]

"System and method for protecting a wind turbine against impending weather events"

A blade mounted radar system comprises a wind turbine having a hub and blades extending therefrom, a radar antenna configured to transmit and/or receive a radio frequency (RF) signal, and a processor in electrical communication with the radar antenna and configured to generate the RF signal for transmission and/or to process the received RF signal. The radar antenna is affixed to one of the blades of the wind turbine such that relative motion is defined between the radar antenna and a target within a line of sight of the radar antenna. The radar antenna detects impending weather events. A turbine controller generates a signal which alters at least one aspect of the wind turbine to secure and protect the wind turbine from the impending weather event. [A17]

"Methods and systems for controlling a vehicle being overtaken"

A method is provided to control a first vehicle when the first vehicle is being overtaken. The method comprises determining whether a rear vehicle is overtaking, and controlling a speed of the first vehicle when it is determined that the rear vehicle is overtaking. [A18]

"Automobile or vehicle proximity sensor and warning display mounted on outside rear view mirror"

The automobile proximity sensor and warning display is mounted on an outside rear view mirror of a vehicle. A flat base plate, adhered to the outside mirror, coacts with a removable body on a front side of the base. The battery powered system includes a proximity detector, responsive to approaching vehicles, generating an alarm signal sent to a lighted display. The body may have a removable mirror. The body may be coupled to the base by complementary coupling sub-systems or an insertable body portion coacting with a shelf on the base wherein a depressible tab is sized to fit within a shelf orifice. As a power saver, an accelerometer detects motion and a timeout circuit turns OFF system power when no motion is detected for a predetermined period of time. [A19]

"Method and device for recognizing marked hazard areas and/or construction areas in the region of lanes"

In order to recognize hazard areas and/or construction areas on a roadway, an environment sensor produces detected environment data regarding objects indicating the hazard areas and/or construction areas. A traffic light system is detected in the environment data, position data of the traffic light system is determined, an environment scenario is determined from the environment data and is compared with a reference model of the environment scenario. If the reference model does not indicate the presence of a traffic light system, or indicates a traffic light system having position data differing from the position data of the detected traffic light system, then it is concluded that the detected traffic light system is a traffic light system identifying a hazard and/or construction area. [A20]

"Systems and methods of gathering and distributing critical weather event information"

A method of gathering and distributing critical weather event information is provided. The method includes monitoring for critical weather events based on defined critical weather event thresholds with an onboard producer weather detection unit of at least one producer vehicle. The critical weather event thresholds are dynamically reconfigured based at least in part on consumption needs of the consumer vehicle. The detected critical weather event and associated time stamp and geolocation information are communicated to a base station. The detected critical weather event is fused with other weather data at the base station to produce a unified weather event image that includes the detected critical weather event. Prediction algorithms are applied to the unified weather event image and are parsed into predefined grid cells of a geo-spatial grid. The predicted weather data is up-linked to a consumer vehicle anticipated to travel within at least one grid cell of the geo-spatial grid. [A21]

"Self-driving vehicles safety system"

Self-driving vehicles safety system, comprising synthesized and coordinated components and entities, including vehicles, pedestrians, and traffic control light mechanisms, exchanging information, employing lidar (light imaging detection and ranging) , radar and intelligent computer-based decision support algorithm systems that analyze images and extract information, to provide safety and vehicle control, regulated and prioritized traffic, and reduced vehicle emissions. [A22]

"Camera module and folded optical system for laser-based speed gun"

A laser-based speed gun includes a camera module and a folded optical system including an objective lens and an eyepiece lens. The folded optical system includes first and second image redirecting elements for redirecting an image pathway from the objective lens to the eyepiece lens adjacent the camera module. [A23]

"Geometric fingerprinting for localization of a device"

Systems, apparatuses, and methods are provided for developing a fingerprint database for and determining the geographic location of an end-user device (e.g., vehicle, mobile phone, smart watch, etc.) with the database. A fingerprint database may be developed by receiving a depth map for a location in a path network, and then identifying physical structures within the depth map. The depth map may be divided, at each physical structure, into one or more horizontal planes at one or more elevations from a road level. Two-dimensional feature geometries may be extracted from the horizontal planes. At least a portion of the extracted feature geometries may be encoded into the fingerprint database. [A24]

"Software defined automotive radar systems"

A radar system processes signals in a flexible, adaptive manner to determine range, Doppler (velocity) and angle of objects in an environment. The radar system processes the received signal to achieve different objectives depending on one or more of a selected range resolution, a selected velocity resolution, and a selected angle of arrival resolution, as defined by memory requirements and processing requirements. The system allows improved resolution of range, Doppler and/or angle depending on the memory requirements and processing requirements. [A25]

"Vehicle-mounted radar device"

A vehicle-mounted radar device providing stabilized performance and enabling a radar main body to be installed easily on a radar bracket. Radar device 100 includes radar main body 106 and a radar bracket 108 for installing on a vehicle. The radar bracket 108 forms an opening area 140 which exposes a transmission and reception surface 112 of the radar main body 106. One or more support parts which are provided on the side plate part 116, and support the radar main body 106 by contacting a side surface 128, or the transmission and reception surface 112 form a withdrawn shape 160 at the end of each of the support parts near the center of the transmission and reception surface 112 and is inclined toward the side distant from the center of the transmission and reception surface 112 and toward the outside of the vehicle. [A26]

"Systems and methods for asphalt density and soil moisture measurements using ground penetrating radar"

Systems and methods for ground penetrating radar for determining thickness, density and moisture are therefore provided. According to an embodiment, a ground penetrating radar (GPR) system comprises a system controller configured to produce an electromagnetic signal for signal penetration of a pavement material. Further, the GPR system comprises a frequency modulated continuous wave controller. Further, the GPR system comprises an ultra wide band (UWB) antenna coupled to the system controller, wherein the UWB antenna is configured to transmit the produced electromagnetic signal to the pavement material and receive the electromagnetic signal as a reflection from the pavement material. Further, the system controller is further configured to receive the electromagnetic signal from the UWB antenna. [A27]

"Land mine detection system"

The present invention discloses a dual-technology sensor head tightly integrating an Electromagnetic Induction (EI) sensor coil for detection, localization and discrimination of metal in mines and Improvised Explosive Devises (IED) , and a dual polarized Ultra-Wideband (UWB) radar antenna array for Ground Penetrating Radar for detection, localization and discrimination of same. The core challenge addressed is how to prevent the EI sensor from detecting the metal in the UWB antenna which then desensitizes the EI sensor and degrades its dynamic range. The key characteristic of the new UWB radar antenna design is its very low magnetic induction, thereby imposing very little degradation to the EI coil. Additionally, the UWB antenna array incorporates unique design features to enhances its low frequency performance for better penetration of the ground. Through the design guidelines taught herein the EI sensor has been demonstrated to incur no degradation from the proximate UWB array. [A28]

"Control apparatus for vehicle"

A disclosed control apparatus used for a host vehicle includes a radar apparatus, a control execution part configured to perform a predetermined control to reduce a probability of a collision between the object and the host vehicle based on information about the object from the radar apparatus, and a prevention part configured to prevent the predetermined control related to a first object when the radar apparatus simultaneously detects the first object and a second object at different distances and a difference between a lateral position of the first object and the lateral position of the second object is smaller than a predetermined value, the first object being closer to the host vehicle than the second object, the lateral position being determined in a lateral direction with respect to a traveling direction of the host vehicle. [A29]

"Successive signal interference mitigation"

A radar system for a vehicle includes a transmitter, a receiver, and an interference mitigator. The transmitter transmits radio signals. The receiver receives radio signals. The received radio signals include transmitted radio signals reflected from objects. The receiver also processes the received radio signals to produce a sample stream. The interference mitigator successively (i) generates respective signals corresponding to the transmitted radio signals that are reflected from each of a plurality of objects, and (ii) adds the respective signals to the sample stream to form a modified sample stream. The addition of the respective signals removes interference from the sample stream due to the transmitted radio signals reflected from the plurality of objects. The receiver is configured to use the modified sample stream to detect a first object at a first range which is more distant than respective ranges of the plurality of objects. [A30]

"Volumetric scan automotive radar with end-fire antenna on partially laminated multi-layer PCB"

A vehicular radar system includes a first printed circuit board (PCB) having a first material. The vehicular radar system also includes a plurality of end-fire antennas positioned on the first PCB. The vehicular radar system also includes a second PCB stacked on or under the first PCB and having a second material that has a greater rigidity than the first material. The vehicular radar system also includes a radio frequency integrated circuit (RFIC) coupled to the plurality of end-fire antennas and configured to control the plurality of end-fire antennas. [A31]

"V2V messaging based on road topology"

A system includes a wireless transceiver and a processor. The processor is programmed to generate an alert message indicative of a roadway obstacle according to sensor data, send the alert message over vehicle-to-vehicle direct communications via the wireless transceiver, and send the alert message to a cellular tower via the wireless transceiver for local cellular broadcast responsive to topology data generated from the sensor data indicating line-of-sight communication is compromised. [A32]

"Meteorological radar system and method and device for processing meteorological information"

A meteorological radar system and a method and device for processing meteorological information which can detect a rain cloud and detect an upward movement of the detected rain cloud in the sky, at low cost and short time are provided. A rain cloud detecting module detects a location and three-dimensional velocity of a rain cloud based on signals from at least three radars of first to third radars disposed at different locations. A rain cloud characteristic detecting module detects a characteristic of the detected rain cloud based on signals from either a radar being different from the three radars, or one of the three radars. [A33]

"System for predicting path of convective cell and control method thereof"

The present invention discloses a system for predicting a path of a connective cell and a control method thereof. According to the invention, a connective cell is detected in a weather radar image, and a path of the detected convective cell is predicted on the basis of a plurality of information stored in advance, thereby guiding various kinds of information about the connective cell including lightning in advance. [A34]

"Device and method for collision risk management for vehicles"

A device, a motor vehicle equipped with the device, a method, and a computer program product including program code to implement the method, for collision risk management pertaining to a vehicle including portions projecting outside a basic configuration of the vehicle, including determining a surrounding configuration as basis for collision risk determination, determining presence of portions projecting outside the basic configuration, determining if collision risk is present at the thus determined surrounding configuration and the thus determined total vehicle configuration, and for an operator of the vehicle indicating the thus determined collision risk. [A35]

"Hybrid pulse compression waveform for high resolution imaging"

A hybrid pulse compression RF system is provided herein in which an enhanced noise waveform and a hybrid waveform are generated to detect a target. for example, the system includes a signal generator that generates an LFM waveform and an enhanced waveform in sequence such that a transmitter of the system transmits the waveforms in the generated sequence in a direction of a possible target. The enhanced waveform may be a partially randomized version of the LFM waveform. If a target is present, the waveforms reflect off the target and are captured by the system in the sequence in which the originally generated waveforms are transmitted. Once captured, the reflected waveforms are processed by the system to generate a hybrid waveform for display such that the range and Doppler resolution and detection capabilities are significantly superior to the state of the art LFM or noise waveform RF systems. [A36]

"Vehicle control apparatus, vehicle driving assistance apparatus, mobile terminal and control method thereof"

A mobile terminal including an output unit, a wireless communication unit configured to receive at least one of object information associated with an object located adjacent to a vehicle and driving information associated with the driving of the vehicle from one or more external devices, and a controller configured to detect a collision possibility between the object and the vehicle based on the driving information and the object information, and control the output unit to output notification information for notifying the collision possibility in response to the collision possibility being detected between the vehicle and the object. [A37]

"Measurement and monitoring device for tire-related variables of a vehicle"

A device for measuring and/or monitoring tire-related variables of a vehicle, having a sensor unit for transmitting, receiving and processing signals, wherein a transmission signal is emitted by an antenna unit of the sensor unit in the direction of an object being measured and wherein a reflection signal reflected by the object being measured is received and analyzed, the sensor unit having a transceiver device, via which a reflection factor, formed as the quotient from the reflection signal reflected by the object being measured and the transmission signal, is measured and via which a resonance frequency and/or a phase difference between the transmission signal and the reflection signal is determined, wherein the transceiver unit comprises a vector network analyzer and an analysis unit, so that a distance to the object being measured is established by detecting the phase difference between the transmission signal and the reflection signal. [A38]

"Method for determining the position of a portable user device around a vehicle and associated location device"

Disclosed is a method of determining the position of a portable user device around a vehicle by a location device placed on board the vehicle and communicating with the portable device by radio waves, including the execution of the following steps whenever the portable device receives a signal from the location device: step E3: Measuring and storing a value of strength of the signal) thus received, step E4: Measuring and storing a value of acceleration) of the portable device, step E5: Calculating a ratio between a variation of the strength value thus measured, relative to a strength value stored at a preceding instant-RSSI, and a variation of the acceleration value thus measured, relative to an acceleration value stored at the preceding instant-AC, step E6: Comparing the ratio thus calculated with at least one predetermined threshold, in order to determine a distance between the portable device and the vehicle. [A39]

"Electromagnetic-wave transmitting cover"

To provide an electromagnetic-wave transmitting cover which can achieve range extension and angle widening of a sensing radar and is excellent in design property. An electromagnetic-wave transmitting cover of the invention includes a base material made of an electromagnetic-wave-transmissive material, a light-transmitting base material formed on a surface of the base material and made of a light-transmissive material, and a design layer disposed between the base material and the light-transmitting base material, the electromagnetic-wave transmitting cover transmitting an electromagnetic wave, the electromagnetic-wave transmitting cover has an electromagnetic-wave transmitting area which transmits the electromagnetic wave, the base material and the light-transmitting base material in the electromagnetic-wave transmitting area has an interval of 0.12 mm or less, an adhesive layer is formed on an entire surface between the base materials, and a deviation in angle when the electromagnetic wave is transmitted is 0.3.degree. or less. [A40]

"Scanning obstacle sensor for the visually impaired"

Various arrangements for avoiding obstacles for a visually-impaired pedestrian are presented. An m by n matrix of distance measurements may be created using a scanning time of flight (ToF) sensor component for various different directions. The m by n matrix of distance measurements and the m by n direction matrix may be analyzed to identify a first obstacle having a vertical height that differs by at least a predefined threshold measurement from a neighboring second region. Based on identifying the first obstacle, an indication of the first obstacle and an indication of the distance to the first obstacle determined using the m by n matrix of distance indications may be output. [A41]

"System, apparatus, and method using ADS-B and TCAS data for determining navigation solutions for a vehicle"

A system using automatic dependent surveillance-broadcast (ADS-B) data and traffic alert and collision avoidance system (TCAS) data for determining navigation solutions for a vehicle is provided. The system has a communal position system (CPS) with a CPS sensor located in the vehicle. The CPS sensor receives ADS-B data and TCAS data from each of one or more proximate vehicles. The system further has a computer system coupled to the CPS. The computer system is configured to perform the steps of: checking the ADS-B data and the TCAS data for data reasonableness, performing data synchronization of the ADS-B data and the TCAS data, and computing a CPS position and a position accuracy based on the ADS-B data and the TCAS data. The navigation solutions include an alternate navigation solution, an independent navigation solution, and a complementary navigation solution. [A42]

"Proximity sensor and method for measuring the distance from an object"

A proximity sensor for measuring the distance from an object contains a microwave oscillator providing, as an output signal, a transmission wave emitted toward the object as a free space transmission wave reflected by the object, the object being electrically conductive or having at least one electrically conductive surface, as a free space reflection wave and is received by the proximity sensor as a reflection wave. The reflection coefficient is determined from the transmission and reflection waves and is provided by the proximity sensor as a measure of the distance. The transmission wave is guided in a waveguide as a waveguide transmission wave and is injected into the waveguide with a wave mode which results in the waveguide transmission wave being separated at the aperture at the front end of the waveguide into the free space transmission wave and in the free space transmission wave propagating to the object. [A43]

"Vehicle traveling control apparatus"

A vehicle traveling control apparatus includes an obtaining unit, a detector, and a controller. The obtaining unit obtains traveling environment information. The traveling environment information includes at least lane line information of a lane along which an own vehicle travels and preceding vehicle information. The detector detects traveling information of the own vehicle. The controller performs a steering control on a basis of the traveling environment information and the traveling information. When the obtaining unit obtains only the lane line information and when the obtaining unit obtains both the lane line information and the preceding vehicle information, the controller performs the steering control on a basis of the lane line information. [A44]

"Systems and methods for detecting and avoiding an emergency vehicle in the proximity of a substantially autonomous vehicle"

Systems and methods for identifying that an emission received or captured from the external environment, or a received electromagnetic signal carrying a data, indicates an emergency vehicle in proximity to a substantially autonomous vehicle and that the emergency vehicle occupies a relative position and/or navigating a relative speed such that the substantially autonomous vehicle is a current or future obstruction for the emergency vehicle. A system comprising at least an aspect of the substantially autonomous vehicle is capable of causing the maneuver of the substantially autonomous vehicle to a position, such that substantially autonomous vehicle is not obstructing the emergency vehicle when at the position. [A45]

"Dual-polarization weather radar data system and method"

The present invention essentially comprises a system, method, computer program and combinations thereof to utilize dual-polarization generated data generally associated with weather and non-weather events for mapping data, producing geo-referenced data, producing mosaics, generation of precipitation masks, non-precipitation mask, and classification masks in general, production of vertical cross sections and predetermined fly throughs, producing short term forecasting, prediction of specific weather phenomenon, correcting or adjusting rain gauge data as well as quantitative precipitation estimation, and combining other meteorological data to correct or adjust estimated rainfall accumulation gathered by dual-polarization radar. [A46]

"Vehicle blind spot sensor"

The vehicle blind spot sensor is a device that secures itself against a portion of a side view mirror in order to detect the presence of other motorists in the side view mirror. The vehicle blind spot sensor includes a plurality of sensors that detect the presence of another motorist that is either approaching or located within a respective blind spot of the respective vehicle. The plurality of sensors additionally determine the distance from the vehicle blind spot sensor to the other motorist that has been detected, and displays this information on a digital display that is visible to a driver of the respective vehicle. The digital display is located on a portion of the surface of the housing that is affixed to the side view mirror. One of the plurality of sensors is used to detect an approaching speed of the other motorist that has been detected. [A47]

"Vehicle type radar device and vehicle type radar control method"

Disclosed herein are an automotive radar apparatus and a method of controlling automotive radar, capable of recognizing a road gradient by easily adjusting a vertical scan angle based on intensities of radio waves received by radar of a vehicle traveling on a road to recognize a gradient of the road, and of preventing deterioration of detection performance by vertically adjusting a radio wave elevation angle of the radar so as to be suitable for the road gradient. The automotive radar apparatus includes an antenna unit transmitting radar signals or receiving reflected radar signals according to elevation angles of a transmission antenna or a receiving antenna, and a control unit searching a center angle based on received power according to the elevation angles to set a beam corresponding to the center angle as a center beam and setting ranges of interest on the basis of the center beam. [A48]

"Pulse-doppler rada measurement of crossing target dynamics"

Disclosed herein are embodiments that relate to crossing target dynamics for a radar system. In one aspect, the present application describes a method for use with a radar system. The method includes transmitting at least one signal pulse. The method also includes receiving a signal associated with reflection of the at least one transmitted signal pulse. Further, the method may also include processing the received signal to determine a cross-range rate. The processing may include determining a Doppler bandwidth based on the received signal. Additionally, the processing may include determining a range based on the received signal. Yet further, the processing may include determining a cross-range extent based on the received signal. Additionally, the processing may include determining the cross-range rate for the target object based on the determined Doppler bandwidth, range, and cross-range extent. An autonomous vehicle may be controlled based on the determined cross-range rate. [A49]

"Beam steering LADAR sensor"

A beam steering capability is proposed for a ladar sensor operating with limited laser transmit power, as may be typical of an airborne or automotive application. The ladar system also makes use of optical gain elements in the receiver which act to increase the signal to noise ratio at the receiver when the laser transmit power available is restricted by power, size, and/or cost limitations. In one embodiment, the calibration of each pixel in the ladar sensor is provided for by an electrical amplifier array with a number of pixel amplifiers. Each pixel amplifier may be individually calibrated to a mating detector element so as to eliminate the variations in dark current and gain between all pixels in the detector array. A number of new detector array designs are described which may lower cost and improve performance, and new low cost and high performance packaging for the detector array, amplifier array, and readout integrated circuit is introduced. [A50]

"Determination of an elevation misalignment angle of a radar sensor of a motor vehicle"

A method for identifying an elevation misalignment angle of a radar sensor of a vehicle, including: identifying elevation angles of radar object localizations with reference to a coordinate system of the radar sensor, an elevation angle of a radar object localization being respectively identified based on radar echoes that are obtained with at least two antenna directional characteristics that differ in an elevation direction, and identifying an elevation misalignment angle based on an occurrence frequency distribution of the elevation angles of at least some of the radar object localizations, and a radar sensor for vehicles having an evaluation device embodied to carry out the method. [A51]

"Method and device for displaying ship vicinity information"

A ship vicinity information display device is provided. The ship vicinity information display device includes a display unit configured to display information indicating a situation in the vicinity of a first ship, a detector configured to detect a second ship existing in the vicinity of the first ship, a ship wave information generating module configured to generate information of ship waves caused by the second ship, and a display processing module configured to cause the display unit to graphically display the second ship detected by the detector, and the information of the ship waves generated by the ship wave information generating module. [A52]

"Work vehicle and control method for work vehicle"

A work vehicle includes: an engine, a plurality of drive wheels driven by the engine, and an operation controller executes first drive force control that brakes a slipping drive wheel out of the plurality of drive wheels and executes second drive force control that reduces output of the engine in accordance with the slip ratio of the slipping drive wheel during execution of the first drive force control. [A53]

"Method for warning a driver of a vehicle of the presence of an object in the surroundings, driver assistance system and motor vehicle"

The invention relates to a method for warning a driver of a motor vehicle (1) about the presence of an object (12) in the surroundings (7) of the motor vehicle (1) by means of a driver assistance system (2) , in which a position of the object (12) is determined by means of a sensor device (9) , an anticipated driving tube (14) of the motor vehicle (1) is determined, a collision distance (DTC) , which describes a distance between the motor vehicle (1) and the object (12) when the motor vehicle (1) moves within the determined driving tube (14) , is determined on the basis of the determined position of the object (12) and the determined driving tube (14) , a minimum distance (SD) between the motor vehicle (1) and the object (12) is determined, and a warning signal is output if the value of the minimum distance (SD) undershoots a predetermined limiting value, wherein the determined value of the minimum distance is adapted as a function of the determined collision distance (DTC) . [A54]

"Athletic performance monitoring systems and methods in a team sports environment"

Systems and methods for sensing and monitoring various athletic performance metrics, e.g., during the course of a game, a practice, a training session, training drills, and the like, are described. These systems and methods can provide useful metrics for players and coaches relating to athletic performances in various sports, including various team sports. [A55]

"Requesting transportation services"

Methods and apparatus are described for safely and efficiently requesting transportation services through the user of mobile communications devices capable of geographic location determination. New customers may be efficiently serviced, and the requester and transportation provider locations may be viewed in real time on the mobile devices. [A56]

"Antenna device and method for operating an antenna device"

An antenna device is disclosed, including a control means and at least two transmission means in predeterminable positions and at least two receiving means in predeterminable positions. The control means is set up in such a way that it alternately individually excites the at least two transmission means in transmission, in such a way that each of the at least two receiving means receives a transmitted signal generated by each of the at least two transmission means. The control means is further set up to excite the at least two transmission means jointly in transmission at a predeterminable moment in such a way that each of the at least two receiving means receives a transmission signal generated by a single virtual transmission means. [A57]

"Determining a location based on radio frequency identification (RFID) read events"

Techniques for determining an item location based on multiple RFID parameters from multiple read events are described. In an example, a computer system may access a first read event. A first RFID reader located within a first zone may have generated the first read event at a first time. The first read event may identify an RFID tag and may include first RFID parameters. The computer system may access a second read event. A second RFID reader located within a second zone may have generated the second read event at a second time within a predefined amount of time from the first time. The second read event may identify the RFID tag and include second RFID parameters. The computer system may determine whether the item location falls within the first zone or the second zone based on two or more first RFID parameters and two or more second RFID parameters. [A58]

"Comfort ride vehicle control system"

Various systems and methods for providing a vehicle control system are described herein. A system for managing a vehicle comprises: a vehicle control system of a vehicle having access to a network, including: a communication module to interface with at least one of: a mobile device, the vehicle, and environmental sensors coupled to the vehicle, and a configuration module to identify a mitigation operation to be taken when predetermined factors exist, wherein the vehicle control system is to identify a potential obstacle in a travel route of the vehicle and initiate a mitigation operation at the vehicle. [A59]

"Method for operating a surroundings-detection system of a vehicle"

A method for operating a surroundings-detection system of a vehicle includes at least one transceiver unit emitting a frequency-modulated signal and receiving echo signals of the emitted frequency-modulated signal. The received echo signals are associated with reflection sources, and a piece of information about the speed of the reflection source relative to the transceiver unit is ascertained on the basis of the received echo signals. [A60]

"Calibration of laser sensors"

Automatic calibration of laser sensors carried by a mobile platform, and associated systems and methods are disclosed herein. A representative method includes determining an overlapping region of point cloud data generated by laser sensors, comparing surface features of the point clouds within the overlapping region, and generating calibration rules based thereon. [A61]

"Antenna array"

An antenna array is provided for monitoring an object. The antenna array includes an emitting antenna module, a first receiving antenna module, a second receiving antenna module and a third receiving antenna module. The emitting antenna module emits a detecting signal, wherein the detecting signal contacts the object, and is reflected by the object as a return signal. The first receiving antenna module receives the return signal. The second receiving antenna module receives the return signal. The third receiving antenna module receives the return signal, wherein any one of the antenna modules has a phase difference of 90 degrees with the nearest neighboring antenna module. [A62]

"Vehicular control system using cameras and radar sensor"

A control system for a vehicle includes a plurality of cameras, at least one radar sensor, and a control having at least one processor. Captured image data and sensed radar data are provided to the control. The control processes captured image data to detect objects present exteriorly of the vehicle and is operable to determine whether a detected edge constitutes a portion of a vehicle. The control processes sensed radar data to detect objects present exteriorly of the vehicle. The control, based at least in part on processing of (i) captured image data and/or (ii) sensed radar data, detects another vehicle and determines distance from the equipped vehicle to the detected other vehicle. The control, based at least in part on determination of distance from the equipped vehicle to the detected other vehicle, may control a steering system operable to adjust a steering direction of the equipped vehicle. [A63]

"Shipping container information recordation techniques"

System and method for obtaining and recording information about cargo includes a frame defining a cargo-receivable compartment, a position determining system at least partly on the frame and that allows for determination of position of the frame, an identification system on the frame that obtains information about cargo when present in the compartment, a memory component that receives and records information about position and movement of the frame, and the obtained information about cargo when present in the compartment in association with a unique identification of the frame, and a communications system on the frame to enable communication of information to and from the memory component. [A64]

"Partially synchronized multilateration or trilateration method and system for positional finding using RF"

Systems and methods for determining a location of user equipment (UE) in a wireless system can comprise receiving reference signals via a location management unit (LMU) having two or more co-located channels, wherein the two or more co-located channels are tightly synchronized with each other and utilizing the received reference signals to calculate a location of the UE. Some systems may include multichannel synchronization with a standard deviation of less than or equal 10 ns. Some systems may include two LMUs, with each LMU having internal synchronization, or one LMU with tightly synchronized signals. [A65]

"Coil arrangement for generating a rotating electromagnetic field and positioning system for determining a position of an identification transmitter"

A coil arrangement is provided for generating a rotating electromagnetic field, comprising at least three coils, each having at least one associated coil winding. The coil arrangement further comprises a ferromagnetic coil yoke which establishes a magnetic coupling between the at least three coils. [A66]

"Ultrasound range correction"

A vehicle system includes a processor having a memory. The processor is programmed to receive a first distance signal output by a radar sensor and calibrate an ultrasound sensor in accordance with the first distance signal output by the radar sensor. A method includes receiving a first distance signal output by a radar sensor, receiving a second distance signal output by an ultrasound sensor, and calibrating the ultrasound sensor in accordance with the first distance signal output by the radar sensor. [A67]

"Automated vehicle radar system with auto-alignment for azimuth, elevation, and vehicle speed-scaling-error"

In accordance with one embodiment, a radar system with auto-alignment suitable for use in an automated vehicle is provided. The system includes a radar-sensor, a speed-sensor, and a controller. The radar-sensor is used to detect objects present in a field-of-view proximate to a host-vehicle on which the radar-sensor is mounted. The radar-sensor is operable to determine a measured-range-rate (dRm) , a measured-azimuth-angle (Am) , and a measured-elevation-angle (Em) to each of at least three objects present in the field-of-view. The speed-sensor is used to determine a measured-speed (Sm) of the host-vehicle. The controller is in communication with the radar-sensor and the speed-sensor. The controller is configured to simultaneously determine a speed-scaling-error (Bs) of the measured-speed, an azimuth-misalignment (Ba) of the radar-sensor, and an elevation-misalignment (Be) of the radar-sensor based on the measured-range-rate, the measured-azimuth-angle, and the measured-elevation-angle to each of the at least three objects, while the host-vehicle is moving. [A68]

"System and method for providing directional information"

A system provides feedback to a user to guide the user to point a part of the body at a target of interest. An angle sensor senses the angle in which the part of the user's body is pointing, such as the head or the hand. The system computes the angle to a target and compares to the angle in which the part of the user's body is pointing and the feedback indicates to the user how to point more closely to the direction of the target. Additional sensors allow the system to update the angle to the target as the position of the user changes. A walking sensor is disclosed to accurately measure the position of the user. [A69]

"Regional adjustment for driver assistance functions"

A vehicle control system and method for operating a host vehicle based on geographic location. The system includes a distance sensor, a location sensor, a user interface, and a controller including an electronic processor and a memory. The controller is communicatively coupled to the distance sensor, the location sensor, the speed control, and the user interface, and is configured to receive a distance signal from the distance sensor indicative of a distance between the host vehicle and another vehicle. The controller receives a location signal from the location sensor indicative of a location of the host vehicle and a control signal from the user interface indicative of a desired mode of operation of the vehicle control system. The controller performs a driver assistance function associated with the desired mode of operation and adjusts a tolerance of the driver assistance function based on the location of the host vehicle. [A70]

"Information technology (IT) equipment positioning system"

An information technology (IT) equipment positioning system comprises a plurality of wireless transponders distributed in multiple locations in the data center and a controller. The controller is adapted to operate the transponders using triangulation to identify and detect positioning according to three-dimensional coordinates for wireless-tagged IT equipment located in the data center. [A71]

"Antenna device with accurate beam elevation control useable on an automated vehicle"

An antenna device includes a plurality of conductive pads that are conductively coupled to each other. A first one of the pads is connected with a first conductive strip. The first conductive strip is not connected to an adjacent second pad. A second conductive strip and a third conductive strip connect the first pad to the second pad. A slot is aligned with the first conductive strip to direct energy from a transceiver at the first conductive strip. The first pad and others in series with it radiate energy based on the energy received by the first conductive strip. The second and third conductive strips conduct energy from the first pad to the second pad. The second pad and others in series with it radiate energy based on the energy received by the second pad. One example use of the antenna device is on an automated vehicle. [A72]

"Vehicle detection"

A vehicle detection and classification system which comprises a plurality of proximity sensors is distributed in a fixed spatial array relative to a road such that a distance of each sensor to the nearest adjacent sensor is less than a minimum horizontal dimension of a vehicle to be detected. The array has a maximum dimension greater than the minimum horizontal dimension of a vehicle to be detected. Each of the sensors is configured to determine presence or absence of a vehicle and to communicate data regarding said presence determination to a data processing system, wherein the data processing system is configured to use data from a plurality of the sensors to detect and classify a vehicle on the road based on at least one dimension of the vehicle. [A73]

"Multi-sensor compressive imaging"

Multi-sensor compressive imaging systems can include an imaging component (such an an RF, microwave, or mmW metamaterial surface antenna) and an auxiliary sensing component (such as an EO/IR sensor) . In some approaches, the auxiliary sensing component includes a structured light sensor configured to identify the location or posture of an imaging target within a field of view of the imaging component. In some approaches, a reconstructed RF, microwave, or mmW image may be combined with a visual image of a region of interest to provide a multi-spectral representation of the region of interest. [A74]

"Peloton"

A vehicle configured to be autonomously navigated in a peloton along a roadway, wherein the peloton comprises at least the vehicle at least one additional vehicle, is configured to determine a position of the vehicle in the peloton which reduces differences in relative driving ranges among the vehicles included in the peloton. The vehicles can dynamically adjust peloton positions while navigating to reduce driving range differences among the vehicles. The vehicle can include a power management system which enables the vehicle to be electrically coupled to a battery included in another vehicle in the peloton, so that driving range differences between the vehicles can be reduced via load sharing via the electrical connection. The vehicle can include a power connector arm which extends a power connector to couple with an interface of another vehicle. [A75]

"Deceleration determination of a vehicle"

A current state of a vehicle can be identified. At least a minimum acceleration capability of the vehicle is determined. A desired acceleration profile to follow is determined based at least in part on the minimum acceleration capability. An acceleration of the vehicle is controlled based at least in part on the desired acceleration profile. [A76]

"Radar based precipitation estimates using spatiotemporal interpolation"

A system and method for improving radar based precipitation estimates using spatiotemporal interpolation is provided. In an embodiment, an agricultural intelligence computer system receives a plurality of radar based precipitation rate values representing precipitation rate measurements at a plurality of locations and a plurality of times. The agricultural intelligence computer system identifies a first non-zero radar based precipitation rate value associated with a first location of the plurality of locations and a first time of the plurality of times. The agricultural intelligence computer also identifies a second non-zero radar based precipitation rate value associated with a second location of the plurality of locations and a second time of the plurality of times. The agricultural intelligence computer system determines that the first non-zero radar based precipitation rate value corresponds to the second non-zero radar based precipitation rate value. Based on the first non-zero radar based precipitation rate value and the second non-zero radar based precipitation rate value, the agricultural intelligence computer system computes a non-zero precipitation accumulation value at a third location and a third time. [A77]

"Forward facing sensing system for vehicle"

A forward facing sensing system for a vehicle includes a radar sensor and an image sensor that sense and view forward of the vehicle. The radar sensor and the image sensor are housed in a self-contained unit disposed behind and attached at the vehicle windshield. A control includes an image processor operable to analyze image data captured by the image sensor in order to, at least in part, detect an object present exterior of the vehicle. The control, responsive at least in part to processing of captured image data and to sensing by the radar sensor, determines that a potentially hazardous condition may exist in the path of forward travel of the vehicle. The radar sensor and the image sensor collaborate in a way that enhances sensing capability of the sensing system for the object in the path of forward travel of the vehicle. [A78]

"Radio-wave-penetrable layer having metallic luster"

Disclosed is a coating layer penetrable by radio wave and having a metallic luster. The coating layer includes a resin layer as an outmost layer to an exterior or front, a metallic texture layer formed on a rear side of the resin layer and comprising a optical film layer including metal oxides having different refractive indexes, and a germanium (Ge) layer to reflect light and a reflection layer formed on the rear side of the metallic texture layer. [A79]

"Compact efficient system to quickly raise and slowly lower an air dam"

A front air dam assembly for a vehicle includes a translatable front air deflecting panel for altering an airflow beneath the vehicle, a deploying mechanism for translating the front air deflecting panel between a raised position and one or more deployed positions, and a rapid raising mechanism for rapidly raising the front air deflecting panel from the one or more deployed positions. A controller in operative communication with the deploying mechanism and the rapid raising mechanism controls the operation thereof. At least one sensor is included for sending a signal indicative of a road or vehicle condition to the controller. A locking mechanism under the control of the controller is provided for locking the front air deflector panel in the raised or the one or more deployed position. [A80]

"System for exploring underground geophysical properties and method for analyzing underground geophysical properties using the same"

The present invention relates to an apparatus and method for analyzing underground geophysical properties using the principle of a ground-penetrating radar. In order to resolve problems of the ground-penetrating radar (GPR) techniques of the related art which mainly acquires an underground image using electric field reflected waves and excludes acquisition of an underground image using magnetic field reflected waves, the present invention provides a system for exploring underground geophysical properties and a method for analyzing underground geophysical properties using the same, the system including: a transmission antenna which is located in a specific spot on the ground and radiates an electromagnetic pulse signal, and a pair of reception antennae which measures an electric field signal and a magnetic field signal which are generated by the radiated signal, in which the system is configured to be able to acquire not only underground images using electric field reflected waves as in technology of the related art but also underground images using magnetic field reflected waves, thereby exploring underground geophysical properties more accurately and effectively than conventional technology. [A81]

"Object detection device and object detection method"

An object detection device includes first information generation circuitry second information generation circuitry, region calculation circuitry, measured value interpolation circuitry, and object determination circuitry. The measured value interpolation circuitry which, in operation, calculates a first interpolated measured value of the first target object region using the second measured value of the second target object region or calculates a second interpolated measured value of the second target object region using the first measured value of the first target object region. The object determination circuitry which, in operation, determines the target object using a combination of the first measured value and the first interpolated measured value or a combination of the second measured value and the second interpolated measured value. [A82]

"Apparatus and method for controlling power of vehicle radar"

The present invention suggests a power control apparatus and method of a vehicle which switch the switching frequency component generated in the power supply module to odd-number times of a Nyquist frequency which is the most ignorable in the frequency domain which is used for the FMCW radar, thereby preventing the erroneous detection due to the switching frequency in the FMCW. The present invention provides a power control apparatus of a vehicle radar, including: a first frequency signal generating unit which generates a first frequency signal with a predetermined amplitude, a second frequency signal obtaining unit which converts a frequency value of the first frequency signal to obtain a second frequency signal, and a power supply control unit which controls the power to operate a vehicle radar based on the second frequency signal. [A83]

"Low cost, high performance radar networks"

A real-time radar surveillance system comprises at least one land-based non-coherent radar sensor apparatus adapted for detecting maneuvering targets and targets of small or low radar cross-section. The radar sensor apparatus includes a marine radar device, a digitizer connected to the marine radar device for receiving therefrom samples of radar video echo signals, and computer programmed to implement a software-configurable radar processor generating target data including detection data and track data, the computer being connectable to a computer network including a database. The processor is figured to transmit at least a portion of the target data over the network to the database, the database being accessible via the network by at least one user application that receives target data from the database, the user application providing a user interface for at least one user of the system. [A84]

"System and method for position and proximity detection"

A system includes a first vehicle having an emitter configured to emit a high RF signal synchronously with at least one EM pulse, and a receiver unit located remote from the first vehicle. The receiver unit includes a magnetic field receiver, an RF transceiver, and a processing module coupled to the RF transceiver and the magnetic field receiver. The receiver unit is configured to receive the high RF signal and the at least one EM pulse from the first vehicle and to determine a proximity of the first vehicle to the receiver unit. [A85]

"Driver assistance system for a vehicle"

A driver assistance system for a vehicle includes a vision system, a sensing system and a control. The vision system includes a camera and the sensing system includes a radar sensor. Image data captured by the camera is provided to the control and is processed by an image processor of the control. Responsive to image processing of captured image data, lane markers on the road being traveled along by the equipped vehicle are detected and the control determines a lane being traveled by the equipped vehicle. Radar data generated by the radar sensor is provided to the control, which receives vehicle data relating to the equipped vehicle via a vehicle bus of the equipped vehicle. Responsive at least in part to processing of generated radar data and captured image data, the control detects another vehicle present on the road being traveled along by the equipped vehicle. [A86]

"Machine safety dome"

A site-aware controller and various sensors determine if objects are located within a safety dome surrounding a machine such as a construction vehicle. The site-aware controller compares data from the various sensors to determine if the machine or independently moveable implements located on the machine are capable of impacting objects within the safety dome and/or travel of the machine into restricted areas. Detection of objects within the safety dome can trigger alerts (e.g., visual and/or audible) to an operator of the machine of a particular situation. Detection of objects within the safety dome can also prevent further movement of the machine or independently moveable implements located on the machine to prevent impacting the objects. The system can also prevent movement of the machine into restricted areas. [A87]

"Localized contour tree method for deriving geometric and topological properties of complex surface depressions based on high resolution topographical data"

Computer-implemented methods for detecting and characterizing surface depressions in a topographical landscape based on processing of high resolution digital elevation model data according to a local tree contour algorithm applied to an elevation contour representation of the landscape, and characterizing the detected surface depressions according to morphometric threshold values derived from data relevant to surface depressions of the topographical area. Non-transitory computer readable media comprising computer-executable instructions for carrying out the methods are also provided. [A88]

"Telematics based on handset movement within a moving vehicle"

At least a system for providing telematics data associated with a vehicle being driven by a driver is described. The vehicular telematics data may be obtained by tracking the movements of a wireless communications device of a driver of the vehicle. The telematics data may provide, among other things, speed, acceleration, deceleration, times of operation, duration of operation, mileage driven per day, and day of the week the vehicle has been used. At least a system for determining risk behavior of a driver is also described. While a vehicle is being driven, data is obtained related to the position and movement of a wireless communications device. The data may indicate the type of behavior exhibited by the driver while the vehicle is being driven. [A89]

"Radar-vision fusion for target velocity estimation"

A method of determining velocity of a target and a fusion system on a moving platform to determine the velocity of the target are described. The method includes obtaining, using a radar system, position and radial velocity of the target relative to the moving platform, obtaining, using a vision system, optical flow vectors based on motion of the target relative to the moving platform, and estimating a dominant motion vector of the target based on the optical flow vectors. The method also includes processing the position, the radial velocity, and the dominant motion vector and determining the velocity of the target in two dimensions. [A90]

"Radar circuit, radar system and method for testing"

A radar circuit for controlling a radar antenna in a vehicle comprises an antenna connection for connection of a radar antenna, a radar circuit for transmission and reception of a radar signal, wherein the radar circuit is connected to the antenna connection. A test circuit to test the connection of the radar antenna is provided. [A91]

"Mobile unit and method for timestamping a message exchanged with the mobile unit"

A mobile unit as well as a method for time-stamping a first message of the first mobile unit to a second mobile unit are provided. The method includes the steps of: determining a roundtrip time between the first mobile unit and a base station, receiving the first message sent by the first mobile unit in the base station, adding a timestamp to the first message in the base station while taking into account the roundtrip time, and sending the time-stamped first message to the second mobile unit. [A92]

"Angle of arrival (AOA) positioning method and system for positional finding and tracking objects using reduced attenuation RF technology"

Systems and methods for determining user equipment (UE) locations within a wireless network using reference signals of the wireless network are described. The disclosed systems and methods utilize a plurality of in-phase and quadrature (I/Q) samples generated from signals provided by receive channels associated with two or more antennas of the wireless system. Based on received reference signal parameters the reference signal within the signals from each receive channel among the receive channels is identified. Based on the identified reference signal from each receive channel, an angle of arrival between a baseline of the two or more antennas and incident energy from the UE to the two or more antennas is determined. That angle of arrival is then used to calculate the location of the UE. The angle of arrival may be a horizontal angle of arrival and/or a vertical angle of arrival. [A93]

"Ground penetrating radar with multiple correlators"

A subsurface detection system may be capable of sensing a buried feature and providing an estimate of the feature's depth. Such a subsurface detection system may comprise a signal generator transmitting at least one signal toward a buried feature and at least one signal along a plurality of various length paths. Each of a plurality of correlators may be associated with one of the various length paths and receive both a signal reflected by the feature and a signal transmitted along one of the various length paths. Each of the correlators may correspond to a distance to the buried feature. As the reflected signal reaches each correlator it may identify a time offset between the arrival of the reflected signal and the signal transmitted along one of the various length paths. By so doing, a distance to the buried feature may be estimated by detecting the correlator with the shortest time offset. [A94]

"Method of automatic sensor pose estimation"

A method and sensor system are disclosed for automatically determining object sensor position and alignment on a host vehicle. A radar sensor detects objects surrounding the host vehicle in normal operation. Static objects are identified as those objects with ground speed approximately equal to zero. Vehicle dynamics sensors provide vehicle longitudinal and lateral velocity and yaw rate data. Measurement data for the static objects--including azimuth angle, range and range rate relative to the sensor--along with the vehicle dynamics data, are used in a recursive geometric calculation which converges on actual values of the radar sensor's two-dimensional position and azimuth alignment angle on the host vehicle. [A95]

"Assured vehicle absolute localisation"

It is proposed to provide a system for localizing a vehicle in a marked environment, provided with a set of markers, e.g. on a road side, the markers emitting a position signal indicative of a respective marker's known geographical position. The system comprises a distance detection unit and a processing unit provided in the vehicle, the processing unit adapted to receive said position signal of a respective marker. The processing unit is adapted to receive said known geographical position from the position signal of said respective marker, and to estimate a first distance measure of the vehicle relative to the respective marker based on a position signal measurement. The processing unit feeds said estimated first distance measure to the distance detection unit, the distance detection unit being adapted to detect said marker within the first distance measure by a second distance measure. The distance detection unit is further adapted to provide the processing unit with the second distance measure of the vehicle relative to the detected marker and with a detection angle of the detected marker, and the localization unit calculating an instantaneous geographical position of said vehicle from the second distance measure, the detection angle and the marker's known geographical position. [A96]

"Automobile door open hazard warning system and methods"

Systems, automobiles, and methods are provided for warning of a potential collision between an approaching object and an opened side door of a vehicle. A system for a vehicle includes an approach sensor, a side door sensor, an alarm, and a controller. The approach sensor is configured to attach to the vehicle and to generate approach sensor data indicating an approaching object that may collide with a side door of the vehicle. The side door sensor is configured to generate door sensor data indicating an impending opening of the side door by an occupant. The alarm is configured to communicate with the occupant. The controller includes an alert initiation module configured to alert the occupant that the approaching object may collide with the side door in response to detecting the impending opening of the side door and detecting the approaching object. [A97]

"Method and apparatus for inspection of cooling towers"

A method and apparatus for inspecting cooling tower fill pack to detect the presence of fouling, wherein the method comprises using ground penetrating radar (GPR) . The method comprises transmitting GPR to the fill pack and detecting reflected radar signals from the fill pack. A method of cleaning fouling from a cooling tower, comprising the steps of: inspecting the cooling tower fill pack with ground penetrating radar (GPR) , identifying those parts of the fill pack in which unacceptable levels of fouling are present, and cleaning the parts so identified is also presented. [A98]

"Longwall system creep detection"

Systems and methods are provided for detecting face creep of a longwall mining system. The system includes a detection device mounted in a maingate roadway and coupled to the detection device. The controller determines the position of the beam stage loader-armored face conveyor interface based on a signal from the first indicator device, determines a position of a maingate line based on a signal from a maingate indicator device, and determines a position of a belt conveyor based on a signal from a belt conveyor indicator device. The controller further determines a first distance between the position of the beam stage loader-armored face conveyor interface and a maingate line, and a second distance between the position of the belt conveyor and the maingate line. The controller generates an indication of face creep based on the first distance and the second distance. [A99]

"Parking space status sensing system and method"

A parking space status sensing system is used for detecting a state of a parking space. A parking space status sensing system includes a first antenna array transmitting a first signal, a second antenna array receiving a second signal feedback reflected from an object, a radio-frequency transceiver receiving the second signal and performing down-conversion and demodulation on the second signal with receiving a local signal modulated from a triangularly modulated signal by the radio-frequency transceiver, to generate a first beat frequency signal. An analog-distance-signal-integral information and an analog-speed-signal-integral information of the object are obtained from the first beat frequency signal by related analog signal processes. [A100]

"Simultaneous object detection and data transfer with a vehicle radar"

In one embodiment, a method includes providing instructions to broadcast a modulated radar chirp signal from a radar antenna of a vehicle. The modulated chirp signal includes data associated with the vehicle. The method includes receiving a first return signal whose waveform substantially matches the modulated chirp signal. The first return signal is the modulated radar chirp signal after reflecting off of an object in an environment surrounding the vehicle. The method includes calculating a location for the object using the first return signal, receiving, from a base station antenna, a second return signal that indicates the modulated chirp signal was received by the base station antenna, and providing instructions to establish a wireless communication session with the base station antenna. [A101]

"Real-time precipitation forecasting system"

A computerized method of processing data for use in weather modeling is provided. The method includes receiving, from a first data source, by a first server, microwave link data including signal attenuation information. The method also includes pre-processing, in real time, by the first server, the microwave link data, thereby producing pre-processed microwave link data, The method also includes storing the pre-processed microwave link data in a first data store. The method also includes receiving, from the first data store, by a second server, the pre-processed microwave link data. The method also includes processing, on a scheduled routine, by the second server, the pre-processed microwave link data using a data transform, thereby producing first weather data. [A102]

"Sense and avoid for automated mobile vehicles"

This disclosure describes an automated mobile vehicle that includes one or more distance determining elements configured to detect the presence of objects and to cause the automated mobile vehicle to alter its path to avoid the object. for example, a distance determining element may be incorporated into one or more of the motors of the automated mobile vehicle and configured to determine a distance to an object. Based on the determined distance, a path of the automated mobile vehicle may be altered. [A103]

"Apparatus and method for mitigating multipath effects and improving absorption of an automotive radar module"

A radar system and method with reduced multipath effects include a first component of a radar sensor module on which at least one antenna element is formed, the at least one antenna element having a surface at which radar radiation is received or transmitted, the at least one antenna element having a radiation aperture. A second component in proximity to the antenna element such that a portion of the radar radiation impinges on the second component comprises an angled surface forming an angle with the surface of the antenna element. The angled surface of the second component comprises a texture such that when the portion of the radiation impinges on the angled surface, the amount of multipath signal propagating through the radiation aperture of the antenna element is reduced. [A104]

"Method for ascertaining a parking area of a street section"

A method for ascertaining a parking area of at least one street section includes providing information indicating a usable width of the street section, the usable width representing a drivable width of the street section between spaces for parked vehicles at the two lateral sides of a driving vehicle, the driving vehicle driving the street section and ascertaining lateral distances from objects using an ascertainment device situated in the driving vehicle, comparing the ascertained lateral distances to the usable width, and ascertaining the parking area by way of the comparison. [A105]

"Apparatus, vehicle, method, computer program and radio system for radio supply in a predefined space"

An apparatus, a vehicle, a method, a computer program and a radio system for radio coverage in a predefined space. The method includes operating at least one transmission and/or reception antenna in the predefined space to cover at least one subregion of the predefined space using at least one element having an active area in the predefined space taking into consideration the subregion to be covered, wherein the active area of the element influences the propagation conditions of signals of the radio system. [A106]

"On-demand multi-scan micro doppler for vehicle"

A radar sensing system for a vehicle includes a transmitter, a receiver, a memory, and a processor. The transmitter transmits a radio signal and the receiver receives a reflected radio signal. The processor samples reflected radio signals during a plurality of time slices. The processor produces samples by correlating reflected radio signals to time-delayed replicas of transmitted radio signals. The processor accumulates the time slices into a first radar data cube (RDC) and selectively processes a portion of the first RDC to produce a first partial Doppler output. The processor produces samples during a second scan and accumulates time slices into a second RDC, and then selectively processes a portion of the second RDC to produce a second partial Doppler output. The processor numerically accumulates the first and second partial Doppler outputs to create a full Doppler output and stores the full Doppler output in memory. [A107]

"Control device"

The invention relates to a control device which has a housing with a housing base and a housing cover In the housing, a circuit board with electronic components has been arranged in the housing, which, furthermore, has a plug connection element with a connector housing. The connector housing has been arranged on the housing base, and in the housing base an opening has been arranged, which is covered by the connector housing and penetrated by connection elements of the plug connection element. A pressure compensation element has been arranged in the connector housing. [A108]

"Vehicle roof structures for concealing one or more sensors"

A vehicle roof structure for concealing one or more sensors therein includes a roof panel, a windshield extending up to the roof panel, and a spoiler. The spoiler extends across at least a portion of a width of the roof panel and includes a leading portion that is substantially parallel to a windshield-roof interface, an apex, wherein a height of the spoiler increases from a height of the roof panel to a height of the apex as the spoiler extends from the leading portion to the apex in a vehicle longitudinal direction, and a trailing portion extending from the apex to the roof panel. A sensor volume is formed between the spoiler and the roof panel. One or more sensors are at least partially positioned within the sensor volume, wherein the one or more sensors output a signal indicative of a characteristic of an environment of the vehicle. [A109]

"Associative object tracking systems and methods"

Systems and methods track a first object when continuous tracking information for the first object is not available. The systems and methods detect when the tracking information for the first object is not available. A last time of a last determined location of the first object is determined and a second object closest to the last determined location at the last time is determined. The location of the first object is associated with a location of the second object if tracking information for the first object is not available. [A110]

"Animal health and wellness monitoring using UWB radar"

A collar with an ultra-wideband radar is described. A housing contains sensor electronics and the transmit and receive antennas are located separate from the housing around the circumference of the collar. A first example of the collar includes a first transmit antenna and a first receive antenna. A second example of the collar adds a second transmit antenna and a second receive antenna. [A111]

"Gated continuous wave radar"

Methods, systems, and apparatus for transmitting a first set of continuous wave (CW) signals, where each CW signal of the first set of CW signals has a first signal frequency and the transmitter is turned off between transmission of each CW signal of the first set of CW signals. for each CW signal of the first set of CW signals, receiving a reflection of the CW signal, and selecting an analog to digital (A/D) sample of the reflection of the CW signal that does not contain ground reflections by selecting the A/D sample based on timing from the transmitter being turned off after transmission of the CW signal. Integrating the selected A/D samples from each of the CW signals of the first set of CW signals to obtain a single A/D sample for the first set of CW signals. [A112]

"Sealed head construction for liquid level transducers"

A liquid level transducer (10) for mounting to a cryogenic tank includes a mounting head assembly (14) for connection to the tank (12) and an elongate sensing probe assembly (16) extending from the mounting head assembly (14) and into the tank. The mounting head assembly (14) has a lower mounting member (40) connected to the sensing probe assembly (16) . The mounting head assembly also includes a tank mounting member (42) with a central bore (74) and a transverse wall (87) located within the bore. An upper connecting section (60) of the member (40) is threaded into the bore (74) . A seal (147) is positioned between the transverse wall (87) and the upper connecting section (60) . The upper connecting section (60) has a corrugated feature that receives and deforms the seal to interlock the components together and increase the sealing surface area therebetween. [A113]

"Multi-model switching on a collision mitigation system"

Systems and methods for controlling an autonomous vehicle are provided. In one example embodiment, a computer-implemented method includes receiving data indicative of an operating mode of the vehicle, wherein the vehicle is configured to operate in a plurality of operating modes. The method includes determining one or more response characteristics of the vehicle based at least in part on the operating mode of the vehicle, each response characteristic indicating how the vehicle responds to a potential collision. The method includes controlling the vehicle based at least in part on the one or more response characteristics. [A114]

"Peripheral information detection device and self-driving vehicle"

A peripheral information detection device includes a device body that is mounted with sensors each including a detection section that detects peripheral information, and a wiping mechanism that wipes off foreign objects that have adhered to locations of the device body facing the detection sections. [A115]

"FTM protocol with angle of arrival and angle of departure"

Apparatuses and methods are disclosed for performing ranging operations between a first device and a second device. The first device may receive, from the second device, a fine timing measurement (FTM) request frame including a request to estimate angle information for a number of frames exchanged with the second device and indicating a level of accuracy for the estimated angle information. The first device may transmit a first FTM frame to the second device, may receive an acknowledgement (ACK) frame from the second device, and may transmit, to the second device, a second FTM frame including angle information of the first FTM frame and timing information of one or more of the exchanged frames. [A116]

"Object detection apparatus and method"

A capture region calculation unit calculates a capture point having the local highest reflection intensity in power profile information and calculates a capture region surrounding the capture point. An edge calculation unit calculates the edges of one or more objects from image data. A marker calculation unit calculates a marker from the capture region. A component region calculation unit calculates component regions by extending the marker using the edges. A grouping unit groups component regions belonging to the same object, of the component regions. The object identification unit identifies the types of one or more objects (e.g., large vehicle, small vehicle, bicycle, pedestrian, flight object, bird) on the basis of a target object region resulting from the grouping. [A117]

"System and method for mobile data expansion and virtual pathway designation"

A data expansion system that provides for wireless communication includes a set of roadway communication devices configured to enable vehicle-to-vehicle (V2V) communication. The system includes a first roadway communication device configured to receive data from a first electronic device in a first vehicle and a second roadway communication device communicatively coupled to the first roadway device. The second roadway communication device is configured to communicate the data to a second electronic device in a second vehicle. Each roadway communication device includes a wireless transceiver to transmit and receive data, a communication interface to establish communication links with other roadway communication devices, and processing circuitry to relay the data between the other roadway communication devices or electronic devices in respective vehicles. Each roadway communication device also includes a housing that contains the processing circuitry, communication interface and the wireless transceiver. The housing is configured to be mounted within a roadway surface. [A118]

"System and method for mobile data expansion"

A data expansion system that provides for wireless communication includes a set of roadway communication devices configured to enable vehicle-to-vehicle (V2V) communication. The system includes a first roadway communication device configured to receive data from a first electronic device in a first vehicle and a second roadway communication device communicatively coupled to the first roadway device. The second roadway communication device is configured to communicate the data to a second electronic device in a second vehicle. Each roadway communication device includes a wireless transceiver to transmit and receive data, a communication interface to establish communication links with other roadway communication devices, and processing circuitry to relay the data between the other roadway communication devices or electronic devices in respective vehicles. Each roadway communication device also includes a housing that contains the processing circuitry, communication interface and the wireless transceiver. The housing is configured to be mounted within a roadway surface. [A119]

"Methods and apparatus for collocating electromagnetic coils and electronic circuits"

Methods and apparatus according to the invention include inductive units or apparatus such as magnetic metal detectors comprising multiple electromagnetic coils and circuit boards such as electronic printed circuit boards (PCBs) so that the circuit boards, while containing metallic surfaces and layers, are positioned in such a way as to reduce or eliminate their effect on the metal detector's coils. The apparatus comprising: a plurality of electromagnetic coils and a plurality of circuit boards, and wherein at least one of said circuit boards is positioned so that its thickness direction is orthogonal to the magnetic field of at least one of said coils. [A120]

"Minimizing incorrect sensor data associations for autonomous vehicles"

Minimizing incorrect associations of sensor data for an autonomous vehicle are described. A driving environment of the autonomous vehicle includes a stationary object and a dynamic object. Such objects can be detected by radar sensors and/or lidar sensors. In one example, a history of radar observation can be used to minimize incorrect sensor data associations. In such case, the location of a stationary object in the driving environment can be determined. When a dynamic object passes by the stationary object, lidar data of the dynamic object is prevented from being associated with radar data obtained substantially at the determined location of the stationary object. In another example, identifiers assigned to radar data can be used to minimize incorrect sensor data associations. In such case, lidar data of an object can be associated with radar data having a particular identifier. [A121]

"On-vehicle radar apparatus capable of recognizing radar sensor mounting angle"

An on-vehicle radar apparatus includes a radar sensor and a mounting angle calculation section that calculates a mounting angle of the radar sensor, and the radar sensor is mounted on a vehicle so that a sensing area includes a direction of 90 degrees relative to a front-back direction of the vehicle and detects a relative speed to an observation point at which the radar wave is reflected in the sensing area and an azimuth at which the observation point is located. The mounting angle calculation section calculates a mounting angle of the radar sensor from an azimuth of a speed zero observation point, the speed zero observation point being the observation point with a relative speed of zero. [A122]

"Vehicle controller, vehicle control method, and vehicle control program"

The present disclosure provides a vehicle controller which includes an identification unit that identifies an operation state of a traffic signal existing on a route up to a destination, a setting unit that sets an automated drive mode section on the route based on the operation state of the traffic signal identified by the identification unit, the automated drive mode section being a section where an automated drive mode of controlling acceleration, deceleration, or steering is permitted during travelling of a vehicle, and a travel control unit that controls the travelling of the vehicle in the automated drive mode in the automated drive mode section set by the setting unit. [A123]

"Radiofrequency transmission device"

A radiofrequency transmission device (D') includes: a transmission unit (10) for transmitting a voltage signal (S) in pulsed form, a radiofrequency antenna (A) , filtering elements (30') , and a voltage source (Vcc) , wherein the filtering elements (30') include: "n" coils (B.sub.1, B.sub.2. . . B.sub.n) , electrically connected in series, of which (n-1) coils each have a natural resonance frequency such that: f.sub.RLi=i.times.f.sub.F each having an inductance (L.sub.i) such that, at the predetermined fundamental frequency: L.sub.TOT=L.sub.1+L.sub.2+ . . . L.sub.i+ . . . L.sub.n=Z.sub.TOT=Z.sub.1+Z.sub.2+ . . . Z.sub.i+ . . . Z.sub.n and L.sub.i=Z.sub.i where f.sub.RLi Is the natural resonance frequency of the i-th coil i is a number varying from 2 to n, L.sub.TOT is the total inductance of the n coils, L.sub.i is the inductance of the i-th coil, Z.sub.TOT is the total impedance of the n coils, Z.sub.i is the impedance of the i-th coil, n is an integer greater than zero. [A124]

"Vehicle driving assist apparatus"

The vehicle driving assist apparatus of the invention provides a display device with an attention display command when an attention condition that a time predicted for a vehicle to reach a target is larger than a lower limit threshold time and smaller than or equal to a display start threshold time is satisfied. The lower limit threshold time is larger than or equal to a display time required for one attention display operation to be completed. The display start threshold time is larger than the lower limit threshold time. When the attention display condition is not satisfied, the apparatus does not provide the display device with the attention display command. [A125]

"Object detection apparatus"

In an object detection apparatus, a proximity determination unit determines whether or not a first object and a second object are in close proximity to each other, where the first object is an object detected based on detection information acquired from a radar and the second object is an object detected based on a captured image acquired from a monocular camera. A sameness determination unit determines that the first object and the second object are the same object, if it is determined that the first object and the second object are in close proximity to each other and if a difference between a first collision time with the first object and a second collision time with the second object is less than a reference value. [A126]

"Detecting roadway targets within a multiple beam radar system"

The present invention extends to methods, systems, and computer program products for detecting targets across beams at roadway intersections. Embodiments of the invention include tracking a target across a plurality of beams of a multiple beam radar system in a roadway intersection and updating track files for targets within a roadway intersection. Returns from a plurality of radar beams monitoring a roadway intersection are divided into range bins. Identified energy in the range bins is used to compute the position of targets within a roadway intersection. When the position of a target is computed, it is determined if the position is a new position for an existing target or if the position is the position of a new target. [A127]

"Cellular interferometer for continuous Earth remote observation (CICERO) satellite"

A fleet of small spacecraft ("cells") in low Earth orbit combine to form an integrated Earth observing system providing many observations previously requiring distinct sensing systems. Each cell performs a few relatively primitive functions, including emission, reception, sampling, and recording of radio and microwave signals. Each cell observes over a spherical field of view, samples the received signals independently at many small antenna elements, and stores the data from each element. Data from all cells are sent to a common location where they can be combined in diverse ways to realize a wide range of observing functions. These functions may include ionosphere and gravity field mapping, atmospheric radio occultation, ocean, ice, and land altimetry, ocean scatterometry, synthetic aperture radar (SAR) imaging, radar sensing of soil moisture, land cover, and geological surface properties, and interferometric SAR sensing of surface change. The system can also provide real-time messaging, navigation and surveillance functions. [A128]

"Estimating weather and ground reflectivity with doppler spectral information"

Systems, methods, and devices for processing a radar return signal to estimate reflectivity values. An example weather radar system includes one or more antennas configured to transmit a radar signal generated by a transmitter and deliver a radar return signal to a receiver. The example weather radar system further includes one or more processors configured to sample the radar return signal, determine a first signal power measurement of the sampled radar return signal based on Doppler signal processing, determine a quality of the first signal power measurement, and estimate reflectivity values of the sampled radar return signal based on the first signal power measurement when the quality is above a threshold. The example weather radar system further includes memory configured to store the estimated reflectivity values. [A129]

"Target tracking camera"

A target tracking device transmits a radio frequency beam towards a scene, detects backscatter comprising at least a portion of the RF beam reflected from a reflecting object at the scene, and performs operations that include determining whether the reflecting object is a tracking target, determining a position of the tracking target, and generating tracking information indicative of a position adjustment for maintaining an alignment of the target tracking device and the tracking target. A target tracking method includes transmitting a millimeter wavelength beam in a direction of orientation of a camera, detecting backscatter reflected from a reflecting object, determining whether the reflecting object is a tracking target, and determining a position of the tracking target. If a distance to the tracking target has increased from a prior distance, tracking information indicative of a position adjustment for offsetting the increase in distance may be generated. [A130]

"Mobile body measurement device and measurement method"

A single antenna has directionality, transmits a transmission wave toward a golf ball on the basis of a supplied transmission signal, receives a reflected wave that is reflected off the golf ball, and generates a reception signal. A Doppler sensor generates as time series data a Doppler signal having a Doppler frequency. A measurement processing unit calculates a movement direction of a mobile body on the basis of the correlation between the movement direction of the mobile body and the differential between the velocity of a mobile body for a reference time measurement obtained in advance and the velocity of the mobile body after a prescribed amount of time has elapsed from the reference time. [A131]

"Interference cancellation in an FMCW radar"

A radar system for transmitting a FMCW radar sensor signal encompassing a series of frequency modulation ramps and phase-modulated with a first code sequence orthogonal to a respective other code sequence with which a time-synchronized transmitted signal of another FMCW radar sensor is phase-modulated, the radar echoes are phase-demodulated with a code sequence correlating with the first code sequence, and a distance and/or a relative speed of a localized object is identified from a Fourier analysis frequency spectrum, in a first dimension over sampled radar echo values of a frequency modulation ramp, and in a second dimension over the phase-demodulated sequence of radar echoes of the ramps of the transmitted signal, and a vehicle fleet radar system having an FMCW radar sensor in which a code set satisfying a code set orthogonality condition with a code set of a radar sensor of another vehicle is used for phase modulation/demodulation. [A132]

"Sensor apparatus"

A vehicle roof mount includes at least one datum feature. The datum feature is provided according to at least one datum. The at least one datum is determined according to a specified orientation of a sensor included in a sensor frame. The sensor frame is mateable to the roof mount. [A133]

"Control system for vehicle"

A vehicular control system suitable for use in a vehicle includes a data processor module for receiving and processing image data provided by a plurality of video sensors, which include at least five cameras, and sensor data provided by a plurality of non-video sensors, which include a radar sensor. The data processor module receives image data captured by the cameras and radar data captured by the radar sensor. The data processor module communicates with other vehicle systems via a vehicle bus of the equipped vehicle. Responsive at least in part to processing of image data and sensor data at the data processor module, other vehicles present exterior of the equipped vehicle are detected. Responsive at least in part to processing of image data and sensor data at the data processor module, a speed control system of the equipped vehicle is controlled. [A134]

"Advanced warning and risk evasion system and method"

This invention relates in general to the field of safety devices, and more particularly, but not by way of limitation, to systems and methods for providing advanced warning and risk evasion when hazardous conditions exist. In one embodiment, a vicinity monitoring unit is provided for monitoring, for example, oncoming traffic near a construction zone. In some embodiments, the vicinity monitoring unit may be mounted onto a construction vehicle to monitor nearby traffic and send a warning signal if hazardous conditions exist. In some embodiments, personnel tracking units may be worn by construction workers and the personnel tracking units may be in communication with the vicinity monitoring unit. In some embodiments, a base station is provided for monitoring activities taking place in or near a construction site including monitoring the locations of various personnel and vehicles within the construction site. [A135]

"On-vehicle radar device"

In an on-vehicle radar device, a receiving antenna part includes a first antenna array with a plurality of receiving antennas arranged in a first direction perpendicular to a predetermined reference direction, and a second antenna array with three or more receiving antennas arranged in a second direction perpendicular to the reference direction and different from the first direction. A computing part computes the elevation angle of an object, using a first detection angle formed by the reference direction and a direction of the object acquired using the first antenna array in a plane parallel to the reference direction and the first direction, a second detection angle formed by the reference direction and a direction of the object acquired using the second antenna array in a plane parallel to the reference direction and the second direction, and a relative inclination angle formed by the first and second directions. [A136]

"Sensor system for recognizing protruding or exposed objects in the surroundings of a vehicle"

A sensor system for a vehicle for recognizing adjacent vehicles, situated in an adjacent lane, with protruding or exposed objects, is described which includes a first lateral LIDAR sensor. The first lateral LIDAR sensor is tilted about a first transverse axis with respect to the horizontal, so that the first detection range, with its front portion in the travel direction, detects a first upper spatial area laterally ahead of the vehicle, at a height above the installed position of the first lateral LIDAR sensor. The second lateral LIDAR sensor is tilted opposite to the tilt direction of the first LIDAR sensor about a second transverse axis with respect to the horizontal, so that the second detection range, with its rear portion in the travel direction, detects a second upper spatial area laterally behind the vehicle, at a height above the installed position of the second LIDAR sensor. [A137]

"Single space electronic parking meter with meter housing mounted vehicle sensor"

An upper parking meter outer housing component that includes a parking meter cap is provided. The parking meter cap includes an outer surface, an inner surface defining an interior cavity, and a lower edge portion defining an opening into the interior cavity. The lower edge portion is configured to be coupled to a lower housing component of single space meter such that a meter mechanism may be enclosed within the interior cavity of the upper meter dome. The meter cap includes a vehicle sensor coupled to the inner surface of the upper meter dome. The meter cap includes a solar panel coupled to the inner surface of the upper meter dome and configured to supply power to the vehicle sensor. [A138]

"System and method for viewing images on a portable image viewing device related to image screening"

An image screening apparatus includes an image scanner that scans an object and generates an image of the object, at least one portable image viewing device, and a controller including circuitry configured to transmit the generated image to the at least one portable image viewing device, trigger display of the transmitted image on a screen of at least one of the portable image viewing devices, and match the displayed image with the scanned object. An area of interest of the scanned object can be displayed on one portable image viewing device by hovering the one portable image viewing device over the area of interest. [A139]

"Coastal HF radar system for tsunami warning"

Systems and techniques are described for tsunami detection and warning using coastal radar systems designed primarily for the real-time mapping of ocean surface currents. These radar systems are configured to detect an approaching tsunami in the system's "near field," i.e., the near-shore region over which the radar system observes the sea surface. [A140]

"Vehicle radar system with blind spot detection"

A vehicle radar system for monitoring a blind spot of a vehicle includes a radar transmitter mounted on the vehicle and a transmitting antenna coupled to the radar transmitter. The transmitting antenna transmits radiation in a pattern into a region adjacent to the vehicle, the pattern comprising a first radiation lobe and a second radiation lobe. A null region of the pattern between the first lobe and the second lobe is directed into the region approximately perpendicular to a longitudinal axis of the vehicle, the longitudinal axis running between a rear end of the vehicle and a front end of the vehicle and running along a line of travel of the vehicle. [A141]

"Doppler-based segmentation and optical flow in radar images"

In an embodiment, a method for processing a sequence of images is provided. The method receives a sequence of images generated by a radar. Each image includes a plurality of pixels. Each pixel includes radial velocity information. The method estimates optical flow for the pixels within an image in the sequence of images by using the radial velocity information for the pixels as a constraint. [A142]

"Apparatus and method for detecting and correcting for blockage of an automotive radar sensor"

A radar system and method in a host system include a radar detector detecting reflected radar signals and converting the reflected radar signals into digital data signals. A motion detector detects motion of the host system and indicates velocity of the host system. A processor receives the digital data signals and processes the digital data signals to categorize the digital data signals into target categories, one of the target categories being an environmental clutter category, the processor associating each of a plurality of processed groups of the digital data signals with a velocity, one of the groups of digital data being associated with a first preselected velocity. When the velocity of the host system changes, if the velocity associated with the one of the groups of digital data of the environmental clutter category has not changed, then the processor indicates that the radar detector is at least partially blocked. [A143]

"Vehicle radar device"

A vehicle radar device provided with a transmission and reception unit for generating a beat signal from a transmission signal and a reception signal, a frequency analysis unit for generating a two-dimensional spectrum including a speed component and a distance component by applying prescribed frequency analysis processing to a signal sequence of the beat signal, and a speed determination unit for dividing the speed component of the two-dimensional spectrum into a plurality of blocks, carrying out constant false alarm rate (CFAR) processing on each of the plurality of blocks, and specifying the speed of the vehicle of the radar device on the basis of a threshold obtained through the CFAR processing. [A144]

"Human respiration feature extraction in personal emergency response systems and methods"

A non-wearable Personal Emergency Response System (PERS) architecture is provided, implementing RF interferometry using synthetic aperture antenna arrays to derive ultra-wideband echo signals which are analyzed and then processed by a two-stage human state classifier and abnormal states pattern recognition. Systems and methods transmit ultra-wide band radio frequency signals at, and receive echo signals from, the environment, process the received echo signals to yield a range-bin-based slow signal that is spatially characterized over a plurality of spatial range bins, and estimate respiration parameter (s) of the human (s) by analyzing the slow signal. The antennas may be arranged in several linear baselines, implement virtual displacements, and may be set into multiple communicating sub-arrays. A classifier uses respiration and other derived features to classify the state of the human (s) . A decision process is carried out based on the instantaneous human state (local decision) followed by abnormal states patterns recognition (global decision) . [A145]

"Method and arrangement for determining safe vehicle trajectories"

A method and arrangement for determining safe vehicle trajectories for a vehicle equipped with sensors for monitoring a surrounding environment, taking into account sensing limitations, as well as a vehicle including such an arrangement. The method includes detecting observable obstacles, detecting unobservable areas, adding virtual obstacles in unobservable areas, associating each observable obstacle and each virtual obstacle with one or more hypothetical events and assigning an occurrence probability to each combination of obstacle and one or more events, and determining safe vehicle trajectories based on both observable obstacles and virtual obstacles and the occurrence probability of each combination of obstacle and one or more events. [A146]

"Wearable alarm system incorporating phased-array radar water sensing"

A safety system comprised of safety devices each worn by a caretaker and up to three people requiring minding, that alerts using color coded LED lights and audible tones when a monitored person is in danger. The device alerts if the person is beyond a preset distance, is close to or is in a body of water, or signals they are in trouble, using phased-array radar coupled with image processing. The phased-array radar allows the remote sensing of water in either daylight or night. The phased-array radar comprises multiple antenna elements including an independent antenna element phase shifter allowing beamsteering. The device scans an object using a preset beamsteering algorithm independent of movement. The multiple antenna elements and beamsteering improve image data accuracy which is then interpreted and correlated with a body of water characteristics. The phased-array radar is also used for caretaker-monitored person communications. [A147]

"Distance measurement using the time-of-flight of signals"

There is provided a method of measuring the distance between a first device and a second device, the method comprising performing a time-of-flight-based distance measurement to measure the distance between the first device and the second device, wherein the length of the signals transmitted and/or the number of time-of-flight measurements obtained during the time-of-flight-based distance measurement is determined according to an accuracy level required for the distance measurement. [A148]

"Automated vehicle communications system"

An automated vehicle (AV) can be managed by a backend system and include an acceleration, braking, and steering system, an AV control system to maneuver the AV through road traffic throughout a given region, a memory to store a network resource map indicating locations of base stations and available network types providing coverage from the base stations throughout the given region, a communications array to transmit and receive communications from the backend system, and a communications system. The communications system can utilize the network resource map to dynamically select optimal network types from proximate base stations to communicate data with the backend system, and dynamically configure the communications array to connect with the optimal network types to transmit and receive data with the backend system. [A149]

"Device for signalling objects to a navigation module of a vehicle equipped with this device"

A device performs real-time signaling of at least one object to a navigation module of a vehicle. The device includes a first sensor to produce first-sensor data including a first captured position and a first captured speed of the object relative to the vehicle, at least one second sensor to produce second-sensor data including a second captured position and a second captured speed of the object relative to the vehicle, a synchronization module to produce synchronized data including a first synchronized position from the first captured position and the first captured speed and at least one second synchronization position from the second captured position and the second captured speed, and a merging module to produce merged data including a merged position from the first synchronized position and the second synchronized position to signal the object to the navigation module by communicating all or part of the merged data thereto. [A150]

"Mounting structure for vicinity information detection sensor"

A mounting structure for a vicinity information detection sensor, comprising: an apron upper member arranged along a vehicle front-and-rear direction at a vehicle width direction outer side of a vehicle front portion, and a vicinity information detection sensor equipped with a detection unit that detects vicinity information of the vehicle, the vicinity information detection sensor being mounted to the apron upper member, directly or via a bracket, such that the detection unit is oriented to the vehicle outer side. [A151]

"Integrated circuit for saturation detection, wireless device and method of detecting saturation"

An integrated circuit for saturation detection comprises: a plurality of gain components, a plurality of saturation detectors with each saturation detector operably coupled to an output of one of the gain components, a plurality of logic elements with a first input of each logic element associated with an output of one of the saturation detectors, and a controller operably coupled to the plurality of logic elements. The controller is arranged to apply a signal to a second input of individual ones of the plurality of logic elements such that an output of the respective logic element identifies a saturation event of the saturation detector associated with that respective logic element. [A152]

"Bifurcated communications to a third party through a vehicle"

A vehicle is provided that determines a need for communication with a third party vendor, retrieves a user rule from the memory (the user rule defines to which third party vendor the vehicle can send a first communication to address the need and defines a geographic location of the third party vendor relative to a current location of the vehicle, a monetary amount the vehicle can pay to a third party vendor for a product or service to address the need, and a time limit for the third party vendor to provide the product or service to address the need) , based on the user rule, selects a third party vendor from among multiple possible third party vendors, and when determined by the user rule, automatically sends the first communication to the selected third party vendor to address the need. The first communication is associated with an order for the product or service, and the processor provides an authorization to the selected third party vendor to complete the order. The vehicle uses different antennas positioned at different physical locations on an exterior of the vehicle to provide the first communication and authorization to the selected third party vendor. [A153]

"Method for distinguishing between real obstacles and apparent obstacles in a driver assistance system for motor vehicle"

In a method for distinguishing between real obstacles and apparent obstacles using a driver assistance system for motor vehicles equipped with a position finding system for determining one's own location, as well as a radar sensor for measuring the distances and relative velocities of radar targets, positional information for radar targets recognized as apparent obstacles is stored in a database, and when the driver assistance system recognizes a stationary radar target at a specific location, the driver assistance system queries the database whether an apparent obstacle is stored for this location. [A154]

"Radar device, vehicle control system, and signal processing method"

A radar device which receives reflected waves from objects, and derives still targets, includes: a determining unit that determines whether any other still target exists at a position in the vicinity of a reference target which is a still target existing at a position closest to a position of a vehicle in a longitudinal direction, and a setting unit that makes it easy to determine the reference target as a roadblock, in a case where the number of other still targets existing at positions in the vicinity of the reference target is equal to or less than a predetermined value. [A155]

"Vehicle control apparatus and vehicle"

In a vehicle control apparatus, a rear side detecting unit, mounted to an own vehicle, detects another vehicle that is present in a first area behind and to a side of the own vehicle. A time acquiring unit, mounted to the own vehicle, acquires a first time that is an estimated time at which a front approaching vehicle will arrive at the first area. The front approaching vehicle is another vehicle that is relatively nearing the own vehicle from ahead of the own vehicle. A sensitivity setting unit, mounted to the own vehicle, sets a detection sensitivity of the rear side detecting unit to the other vehicle in at least a part of the first area in such a manner that the detection sensitivity during a predetermined period set based on the first time is higher than the detection sensitivity during a remaining period other than the predetermined period. [A156]

"Ship radar apparatus and method of measuring velocity"

Error that occurs when an absolute velocity of a target object is measured by using an antenna installed on a ship body that rocks and drifts in a complex manner since it floats on the sea is reduced. An antenna is installed on a ship body and transceives electromagnetic waves. A roll angle and a pitch angle of the ship body are detected by using an inclination sensor. An antenna velocity calculator calculates an antenna velocity of the antenna by using the detected roll and pitch angles of the ship body. An antenna velocity compensator compensates the antenna velocity of the antenna for a relative velocity between the ship body and a target object, the antenna velocity calculated by the antenna velocity calculator, the relative velocity obtained based on reflection waves received by the antenna. [A157]

"Methods and apparatus for positioning a vehicle"

Methods and apparatus are disclosed for positioning a vehicle. An apparatus for determining positioning information for a vehicle may comprise a plurality of receive coil circuits and a hardware processor. The plurality of receive coil circuits is configured to generate voltage signals from a magnetic field. The hardware processor is configured to generate position estimates of a position of the magnetic field generator with respect to a position of the plurality of receive coils. Each of the first sequence of position estimates is determined based upon a corresponding voltage vector derived from the voltage signals and at least one of a plurality of reference vectors. The hardware processor is configured to update the plurality of reference vectors based upon the first sequence of position estimates and a second sequence of position estimates generated based upon a source different from the plurality of receive coil circuits. [A158]

"Localization of a device using multilateration"

Systems, apparatuses, and methods are provided for determining the geographic location of an end-user device using a multilateration calculation. The end-user device collects a depth map at a location in a path network. Two-dimensional feature geometries are extracted from the depth map, and a number of control points are identified in the extracted feature geometries. Distances are calculated between the end-user device and the identified control points. Location reference information is received for each identified control point from an external database. A geographic location of the end-user device in the path network is determined through a multilateration calculation using the location reference information of the identified control points and the calculated distances between the end-user device and each identified control point. [A159]

"Construction machine control system, construction machine, construction machine management system, and construction machine control method and program"

A construction machine control system for a construction machine that travels along a travel route, includes: a position detection unit that detects a position of the construction machine, a non-contact sensor that detects a position of an object around the construction machine, and a measurement output unit that detects a position of a vertical projection that protrudes vertically from a detection result of the position detection unit and a detection result of the non-contact sensor and stores the detected position of the vertical projection in a map information storage unit as map information, wherein the measurement output unit determines whether the construction machine is in a state that decreases accuracy of the map information, and when it is determined that the construction machine is in the state that decreases the accuracy of the map information, the measurement output unit stops storing the map information. [A160]

"Method for determining a driver-specific blind spot field for a driver assistance system, driver assistance system and motor vehicle"

The invention relates to a method for operating a driver assistance system (2) for a motor vehicle (1) , in which a driver-specific blind spot (3) in the surroundings (4) of the motor vehicle (1) is determined, wherein at least one boundary edge (8, 9) of a driver-specific field of vision (5) of a motor vehicle driver is determined as a function of a movement behavior of the motor vehicle driver's head and/or as a function of the visual faculty of the motor vehicle driver, and the dimension (a2) and/or a local position of the driver-specific blind spot (3) in the surroundings (4) of the motor vehicle (1) is determined as a function of the determined boundary edge (8, 9) of the driver-specific field of vision (5) . [A161]

"Antenna and vehicle having the antenna"

An antenna includes a first antenna body formed as a hollow cylindrical shape having a first outer surface, a first inner surface and a first radiation surface formed in a circular shape, a second antenna body accommodating the first antenna body inside the second antenna body, the second antenna body formed as a hollow cylindrical shape with a second outer surface, a second inner surface and a second radiation surface formed in a ring shape, a plurality of first partitions, and a plurality of second partitions, wherein a plurality of first radiation apertures, formed by the plurality of first partitions for radiating a first radio wave, is formed on the first radiation surface, and a plurality of second radiation apertures, formed by the plurality of second partitions for radiating a second radio wave, is formed on the second radiation surface. [A162]

"Distributed computing with cloud computed feedback to process sensors"

A process control system for controlling an industrial process includes a cloud-computing dependent (C.sup.2D) radar level gauge or ultrasonic flow meter (C.sup.2D sensor device) including a sensor, transducer, communications unit, with limited hardware/software incapable of calculating an accurate level calculation or high accuracy gas flow rate. A bus couples the sensed data from the C.sup.2D sensor device to an IP communications unit that outputs IP protocol data. The cloud computing system is coupled by an IP network to receive the IP protocol data and includes a processor executing advanced data processing algorithms which provides a second part of the C.sup.2D sensor device including processing the IP data to generate a remote computational result including the accurate level calculation/high accuracy gas flow rate. The cloud computing system feeds back the remote computational result to a process controller coupled to an actuator that controls processing equipment for automatically tuning the industrial process. [A163]

"Radar sensor for motor vehicles"

A radar sensor for vehicles, including a group antenna, having a linear array of antenna elements, a feed unit for feeding transmission signals having a settable phase relationship into the antenna elements, a control unit controlling the feed unit, and an evaluation device evaluating received radar echoes and angle-resolving locating of objects. The group antenna includes at least two non-interleaved subgroups, the feed unit supplies in-phase transmission signals to the elements, while the transmission signals for the various subgroups have a settable phase difference, the control unit periodically changes the settable phase difference so that the transmission signals have a base phase difference in one measuring cycle and a phase difference in another measuring cycle which differs by a fixed absolute value from the base difference. The control unit sets the base difference based on levels of the received radar echoes to maximize the level difference between the measuring cycles. [A164]

"Radar system for motor vehicles, and motor vehicle having a radar system"

A radar system for motor vehicles has at least two radar sensors for emitting and receiving radar radiation for monitoring the surroundings of the motor vehicle, the at least two radar sensors being each positioned at an angle between 40 degrees and 50 degrees to an axis, and the at least two radar sensors being configured in such a way that the respective antenna has a pivotable visual range of an angle between at least -60 degrees and +60 degrees, in particular between -45 degrees and +45 degrees, relative to the main emission direction of the respective radar sensor. [A165]

"Methods, devices and systems for tracking vehicles"

An identification kit includes a first tag member and a second tag member. The first tag member is for mounting onto a rearview mirror of a vehicle and has at least one first visual identifier displaying a unique identification code and a first passive RFID tag. The second tag member for mounting onto a vehicle key and has at least one second visual identifier displaying the unique identification code and a second passive RFID tag. [A166]

"Surroundings monitoring device of vehicle"

When a to-be-monitored image exists in an image lacking from a bird's-eye image for surroundings monitoring though the to-be-monitored image is imaged by a camera for monitoring, the to-be-monitored image is securely displayed on a display. Cameras 6F, 6B, 6L, 6R are provided in a longitudinal direction and in a lateral direction of a dump truck 1, in playing bird's-eye images 10F, 10B, 10L, 10R acquired by converting view points of a through image imaged by each camera, so as to display a to-be-monitored image in a to-be-monitored image undisplayable area, each through image imaged by each camera is aggregated on one screen by an image aggregating unit 21, this aggregated screen is scanned by a to-be-monitored image detector 20 to detect the to-be-monitored image, and the to-be-monitored image is superimposed on a synthetic bird's-eye image 10 displayed on the display 9 and is displayed. [A167]

"Vehicle control system and method"

A vehicle control system for a vehicle having a driver assistance system includes sensors configured to acquire data about surroundings of the vehicle, a user interface configured to display user information and acquire user input from a user, and a processing unit coupled to the sensors, the driver assistance system and the user interface. The processing unit is configured to produce and provide adapted parameters to the driver assistance system based on acquired user input about sensor data and/or actions performed by the driver assistance system. In a corresponding method, the parameters are adapted based on the acquired user input. [A168]

"Vehicle platooning with a hybrid electric vehicle system"

A system and method are provided for controlling the operation of a vehicle equipped with a hybrid electric front end motor-generator system during vehicle platooning operations to maintain a predetermined separation distance between vehicles in the vehicle platoon. The motor-generator is operated to generate vehicle acceleration and deceleration by outputting torque to an engine crankshaft to accelerate the vehicle or generating a regenerative braking load via the crankshaft on the vehicle, in place of the vehicle's internal combustion engine and braking systems, when the required vehicle accelerations and/or decelerations needed to maintain the desired vehicle separation distance are small and within the torque output or torque load capacity of the motor-generator. If the required vehicle acceleration or deceleration is greater than the motor-generator's available capacity, the motor-generator may be operated to provide a portion of the required acceleration or deceleration, as a supplement to the acceleration provided by the engine or the deceleration provided by the braking system. The use of a front end motor-generator system in this manner increases overall vehicle energy efficiency by decreasing fuel consumption and increasing the amount of electrical energy captured for storage during vehicle platooning operations. [A169]

"System and method for mobile data expansion"

In a system of spaced surface markers disposed on a travel surface, each surface marker includes a housing, a power system within the housing producing electrical power from solar energy or vibration, and wireless transceiver (s) within the housing wirelessly communicating with neighboring surface markers. One surface marker relays data from and to another, while a third surface marker relays data from and to a network connection to a remote network. All surface markers may communicate via WiFi. The travel surface may be for vehicles. Each surface marker may communication with a vehicle or mobile device within communication range, to provide location or other information. [A170]

"Meander-type, frequency-scanned antenna with reduced beam squint for an automated vehicle radar system"

A meander-type, frequency-scanned antenna with reduced beam squint suitable for use on an automated vehicle radar system includes a plurality of parallel sub-arrays, each sub-array equipped with a plurality of radiators. The antenna is formed by a serpentine-arrangement of a continuous-strip of material. The serpentine-arrangement configured so a first sub-array characterized by a signal propagating in a first-direction is adjacent to a second sub-array characterized by the signal propagating in a second-direction opposite the first-direction. The first sub-array and the second sub-array are each further configured to define a plurality of radiators configured such that a radar-beam emitted by the antenna in response to the signal is characterized by a direction-angle that is substantially unchanged when a frequency of the signal is varied. [A171]

"Method for detecting targets and associated multifunction radar"

A method for detecting targets, implemented by a multifunction radar wherein the radar comprises an antenna subdivided into at least two portions and is configured to transmit at least two types of signals on distinct frequency bands and to perform at least one ground detection or imaging function. During the transmission phases of an antenna portion, the reception of each antenna portion of the radar is cut. The method comprises, for each range gate, a step of reception of signals, a step of estimation of the autocorrelation matrix associated with the interferences the ground returns and from the thermal noise of the radar and a step of target detection using a test of the generalized maximum likelihood. A multifunction radar configured to implement the method for detecting targets is provided. [A172]

"Low reflection radar bracket"

A radar bracket for a vehicle includes a central portion configured to receive a radar module so that the radar module is exposed on a front side of the radar bracket, and a side wall encircling and extending laterally from the central portion and comprising a non-conductive material. At least of a portion of a backside of the side wall is covered by a radar absorbing material having a dielectric constant higher than a dielectric constant of the side wall. The at least a portion of the side wall has a thickness d.sub.w proportional to a quarter of the wavelength of a signal emitted by the radar module, and selected based on the dielectric constants of the side walls of the radar bracket and the radar absorbing material, such that a reflection at the interface between the side wall and the radar absorbing material is effectively cancelled out. [A173]

"Collision avoidance system"

A collision avoidance system includes: a radar that detects an object that is located behind a vehicle and that detects a distance to the object, a plurality of ultrasonic sensors, each of which detects the object and detects a distance to the object, the plurality of ultrasonic sensors respectively detect different detection areas, an approaching object detection unit that detects an approaching object that approaches the vehicle from among the objects, a screen estimation unit that estimates that there is a screen that blocks an approach to the vehicle from behind, and a control unit that, when the approaching object has been detected, executes driving assistance for avoiding a collision with the approaching object, and, when a distance to the approaching object is larger by a predetermined value or more than a distance to the screen, restricts or prohibits execution of the driving assistance. [A174]

"Driver assistance system for detecting an object in the surroundings of a vehicle"

A method in a driver assistance system of a vehicle for detecting an object in the surroundings of the vehicle. The method has the following steps: emission of at least one measuring pulse by a transmitter, reception of a reflection of the measuring pulse by at least one receiver, determination of a Doppler shift between the emitted measuring pulse and the received reflection in an analysis unit, and determination of a direction toward the object based on the determined Doppler shift. [A175]

"Systems and methods for detecting soil characteristics"

A soil detection and planting apparatus. The apparatus includes a vehicle and a controller coupled to the vehicle. The apparatus further includes a planting device coupled to the vehicle, the planting device configured to plant seeds or plants into a soil material. The apparatus includes a ground penetrating radar sensor coupled to the vehicle. The ground penetrating radar soil sensor is configured to scan the soil material up to a designated depth beneath a surface of the soil material, wherein the ground penetrating radar soil sensor is further configured to provide a sensor feedback signal to the controller with respect to an intrinsic characteristic of the soil material. The controller is configured to instruct placement of a seed or a plant into the soil material based on the feedback signal. [A176]

"Estimating a source location of a projectile"

According to examples of the presently disclosed subject matter, there is provided a system for estimating a source location of a projectile, comprising an optics an optics subsystem, a radar subsystem and a processor. The processor is adapted to use range and velocity measurements obtained from data provided by the radar subsystem, a source direction and an event start time obtained from data provided by the optical subsystem and a predefined kinematic model for the projectile for estimating a range to a source location of the projectile. [A177]

"Learning lanes from radar sensors"

Systems, methods, and apparatuses are disclosed for determining lane information of a roadway segment from vehicle probe data. Probe data is received from radar sensors of vehicles at a road segment, where the probe data includes an identification of static objects and dynamic objects in proximity to the respective vehicles at the road segment, and geographic locations of the static objects and the dynamic objects. A reference point, such as a road boundary, at the road segment is determined from the identified static objects. Lateral distances between the identified dynamic objects and the reference point are calculated. A number of lanes at the road segment are ascertained from a distribution of the calculated distances of the identified dynamic objects from the reference point. [A178]

"Radar apparatus"

A radar apparatus includes a signal processor configured to: derive the target data set of the target, in a predetermined time cycle, based on a reception signal acquired by receiving a reflection wave from the target, detect, based on the target data set, a side wall along a current lane in which the host vehicle is traveling, determine whether or not there is a continuity between a previous target data set and a latest target data set, and in a case where there is no continuity between the previous target data set and the latest target data set, perform "extrapolation," determine based on a frequency of the "extrapolation" whether or not the target associated with the target data set is an upper object overhead of the vehicle and with which the vehicle cannot collide. [A179]

"Amplitude envelope correction"

A system that has a chirp generator for emitting signals and an amplitude modulator for shaping the signals emitted by the chirp generator. The signals are shaped using a calibration ramp. The system further includes a Radio Frequency (RF) power amplifier for amplifying the signals shaped by the amplitude modulator, an RF power detector for measuring power levels of the signals amplified by the RF power amplifier, and a pre-distortion coefficient generator for adjusting the measured power levels using power detector calibration coefficients that correspond to the RF power detector. [A180]

"Method for establishing direction of arrival by use of signals of opportunity"

A method is provided for use of a segmented aperture communications system to determine a direction of arrival of a radio signal in which the system includes a receiver plane having equally spaced and planar aligned radio frequency ports. Computation of the aperture segments depends on the port coordinates where the geometric relationship of the segments is used to determine a time delay and direction of arrival of the signal. The ports receive at least two orthogonal polarizations that characterize the incoming signals. A central port is used as reference to determine a phase difference associated at each port. Two angles are calculated by a simultaneous solution of two phase difference measurements to determine the direction of arrival solution. A mean direction of arrival solution is obtained by averaging solution estimates that are obtained by repeating the direction of arrival determination using random port pairs. [A181]

"Coherent LADAR using intra-pixel quadrature detection"

A frequency modulated (coherent) laser detection and ranging system includes a read-out integrated circuit formed with a two-dimensional array of detector elements each including a photosensitive region receiving both return light reflected from a target and light from a local oscillator, and local processing circuitry sampling the output of the photosensitive region four times during each sample period clock cycle to obtain quadrature components. A data bus coupled to one or more outputs of each of the detector elements receives the quadrature components from each of the detector elements for each sample period and serializes the received quadrature components. A processor coupled to the data bus receives the serialized quadrature components and determines an amplitude and a phase for at least one interfering frequency corresponding to interference between the return light and the local oscillator light using the quadrature components. [A182]

"System and method for navigation assistance"

A system and method are provided for navigation correction assistance. The method provides a vehicle with a camera and an autonomous navigation system comprising a navigation buoy database and a navigation application. The navigation application visually acquires a first navigation buoy with an identity marker and accesses the navigation buoy database, which cross-references the first navigation buoy identity marker to a first spatial position. A first direction marker on the first navigation buoy is also visually acquired. In response to visually acquiring the first direction marker, a first angle is determined between the camera and the first spatial position. A first distance may also be determined between the vehicle and the first navigation buoy using visual methods or auxiliary position or distance measurement devices. Then, in response to the first spatial position, the first angle, and the first distance, the spatial position of the vehicle can be calculated using trigonometry. [A183]

"Integration of a radar sensor in a vehicle"

A disclosed collision detection system for a vehicle includes a radar sensor mounted to the vehicle proximate that is capable of detecting objects in proximity to the vehicle, and at least one component at least partially defining a cavity. The cavity is at least partially filled by a material that modifies a portion of radar energy emitted from the radar sensor and transmitted back to the radar sensor. [A184]

"Material detection on a road"

A material detection system mountable to a ground vehicle. The material detection system includes a first range determination system (RDS) that includes a first electromagnetic radiation (EMR) emitter configured to emit first EMR behind the ground vehicle within a first field of view (FOV) , a first EMR receiver that is configured to receive first EMR reflections, and a first RDS processing device configured to generate first RDS data that identifies distances to reflective surfaces based on the first EMR reflections. A processing device is coupled to the first range determination system and is configured to determine, based at least in part on the first RDS data, that material exists on the road. The processing device is also configured to determine a location of the material, and cause the location to be communicated to a computing device that maintains a map that identifies locations of material larger than a predetermined threshold. [A185]

"Obstacle-information-managing device"

An obstacle-information-managing device determines, with high precision, the presence of an obstacle around a vehicle. The obstacle-information-managing device includes an obstacle-information-acquiring unit, an obstacle-detection-possibility-information-acquiring unit, and an obstacle-presence-determining unit. The obstacle-information-acquiring unit acquires obstacle information pertaining to an obstacle around each of a plurality of vehicles including a host vehicle, the obstacle being detected using environment sensors mounted on the vehicles. The obstacle-detection-possibility-information-acquiring unit acquires obstacle detection possibility information pertaining to the possibility, when at least one obstacle is detected using the environment sensor (s) mounted on at least one of the vehicles and at least one obstacle is not detected using the environment sensor (s) mounted on the remaining vehicle (s) , of at least one of the obstacles being detected using the environment sensor (s) mounted on the remaining vehicle (s) . The obstacle-presence-determining unit determines the presence of at least one obstacle based on the obstacle-detection-possibility information and the obstacle information. [A186]

"All weather autonomously driven vehicles"

Autonomously driven vehicles operate in rain, snow and other adverse weather conditions. An on-board vehicle sensor has a beam with a diameter that is only intermittently blocked by rain, snow, dust or other obscurant particles. This allows an obstacle detection processor is to tell the difference between obstacles, terrain variations and obscurant particles, thereby enabling the vehicle driving control unit to disregard the presence of obscurant particles along the route taken by the vehicle. The sensor may form part of a LADAR or RADAR system or a video camera. The obstacle detection processor may receive time-spaced frames divided into cells or pixels, whereby groups of connected cells or pixels and/or cells or pixels that persist over longer periods of time are interpreted to be obstacles or terrain variations. The system may further including an input for receiving weather-specific configuration parameters to adjust the operation of the obstacle detection processor. [A187]

"Adaptive filtering for FMCW interference mitigation in PMCW radar systems"

A radar sensing system for a vehicle includes a transmitter, a receiver, a processor and an adaptive filter. The transmitter is configured to transmit a radio signal. The receiver is configured to receive radio signals that include the transmitted radio signal reflected from objects in the environment, as well as further including other radio signals transmitted from at least one other radar sensing system. The receiver is further configured to produce a sampled stream. The sampled stream is provided to the processor. The processor, responsive to further processing of the sampled stream, controls the adaptive filter to filter the sampled stream, such that the other radio signals transmitted from the at least one other radar sensing system are removed from the received radio signal. [A188]

"Portable collision warning apparatus"

A collision warning apparatus, mountable in a vehicle to detect collision threat levels between the host vehicle and an object or target detected forward of the host vehicle. All processing and signal generation takes place in a controller in the housing without reliance on external signals, except for input power, from the host vehicle. The controller activates visible and/or audible indicators on the housing to alert the driver of the collision threat level. [A189]

"Multi-use detection system for work vehicle"

A work vehicle may include a chassis, a plurality of ground-engaging devices connected to the chassis and configured to provide support and traction to the chassis along a ground surface, an operator station connected to the chassis, and a rear object detection system configured to detect a presence of an object in an area at least partially rearward of the operator station. The rear object detection system may be further configured to detect a presence of a depression of the ground surface in the area. [A190]

"Course and/or speed data"

Disclosed is a method of determining a velocity of a vessel, comprising the steps of: detecting objects in the vicinity of the vessel, selecting an object having a velocity relative to the vessel which is below a predefined threshold, and determining the velocity of the vessel to be opposite to the velocity of the object. Also disclosed is an apparatus arranged to perform the method. [A191]

"System and method for detection and orbit determination of earth orbiting objects"

A system for detection and orbit determination of Earth orbiting objects includes a first plurality of sensors including at least one first antenna. The at least one first antenna is configured to point in a stare mode to broadcast a first detection signal at an angular region centered on an equatorial plane to maximize detection of orbiting objects regardless of altitude, grade, or inclination. The first antenna may be configured to stare at a low inclination angle, and may be configured to stare at one of due east and due west along the equator. [A192]

"Vehicular radar system with self-interference cancellation"

A radar system is described that comprises a transmitter, a receiver, a spillover cancellation unit, and a combiner. The transmitter transmits radio signals. The receiver receives interfering signals due to local signal coupling of transmitted signals. The local signal coupling comprises at least one interfering path or mechanism. The spillover cancellation unit is configured to output a replica of each of the interfering signals. Each replica is configured to replicate a particular interfering signal received through a particular interfering path or mechanism. The combiner is configured to combine into a signal path of the receiver, a replica of an interfering signal to subtract the interfering signal from the receiver's signal path. The receiver receives the transmitted radio signals reflected from objects in the environment without saturating the signal path of the receiver due to the subtraction of the interfering signal from the receiver's signal path. [A193]

"Microphone gain using a time of flight (ToF) laser range finding system"

Range to a human speaker is determined using a laser-based time of flight (ToF) system, with the range then being used to adjust the gain of a microphone receiving the speaker's voice. If desired, an acoustic-based Direction of Arrival (DoA) system uses acoustic information to determine the direction of incoming sound, such as a person talking, and the direction of the sound is then used to focus the area of laser illumination. [A194]

"Detection of oncoming vehicles with IR light"

Infrared light is detected in a vehicle computer via an infrared sensor from a source outside the host vehicle. The computer can further determine that the infrared light was generated from a source in a second vehicle, detect the second vehicle based at least partly on the detected infrared light and possibly also partly on input from a host vehicle collision detection sensor. [A195]

"Method for providing information about at least one object in a surrounding region of a motor vehicle and system"

A method for providing information about at least one object in a surrounding area of a motor vehicle of a vehicle fleet is provided. The information in the motor vehicle is detected and, together with position data of the motor vehicle is transmitted and provided to a traffic information collection device. The information having at least one first geographic location of the object and a second geographical position of the object is provided and the second geographical position is determined and provided depending on the first geographical position. [A196]

"System and method for providing target threat assessment in a collision avoidance system on a vehicle"

A system and method for providing target selection and threat assessment for vehicle collision avoidance purposes that employ probability analysis of radar scan returns. The system determines a travel path of a host vehicle and provides a radar signal transmitted from a sensor on the host vehicle. The system receives multiple scan return points from detected objects, processes the scan return points to generate a distribution signal defining a contour of each detected object, and processes the scan return points to provide a position, a translation velocity and an angular velocity of each detected object. The system selects the objects that may enter the travel path of the host vehicle, and makes a threat assessment of those objects by comparing a number of scan return points that indicate that the object may enter the travel path to the number of the scan points that are received for that object. [A197]

"Low cost 3D radar imaging and 3D association method from low count linear arrays for all weather autonomous vehicle navigation"

A low cost, all weather, high definition imaging system for an autonomous vehicle is described. The imaging system generates true target object data suitable for imaging, scene understanding, and all weather navigation of the autonomous vehicle. Data from multiple arrays is fed to a processor that performs data association to form true target detections and target positions. A Boolean associator uses an association method for determining true target detections and target positions to reduce many of the ghosts or incorrect detections that can produce image artifacts. The imaging system provides near optimal imaging in any dense scene for autonomous vehicle navigation, including during visually obscured weather conditions such as fog. The system and method can be applied to variety of imaging technologies, including an RF system, a Lidar system, a sonar system, an ultrasound system, and/or an optical system. [A198]

"System and method for correcting vehicle tracing-position of radar sensor using laser scanner"

Provided are a system and a method for correcting a tracing-position of another vehicle sensed by a radar sensor using a laser scanner, which compare an unspecific tracing position of the radar sensor sensing another vehicle and a contour point acquired by a laser scanner and correct the tracing position of the radar sensor with a position most approximate to the vehicle in the contour point. Therefore, the radar sensor sensing an object in the vicinity of the vehicle recognizes a tracing position of another vehicle to facilitate design of a radar sensor based system. [A199]

"Automated vehicle radar system to determine yaw-rate of a target vehicle"

A radar system suitable for an automated vehicle includes a radar sensor and a controller. The radar-sensor is mounted on a host-vehicle. The radar-sensor is operable to detect radar-signals reflected by scattering-points of a target-vehicle located proximate to the host-vehicle. The controller is in communication with the radar-sensor. The controller is configured to determine a present-range-rate, a present-azimuth, and optionally a present-range, of each of the scattering-points at a present-time. The controller is also configured to recall a prior-range-rate, a prior-azimuth, and optionally a prior-range, of each of the scattering-points at a prior-time. The controller is also configured to calculate a yaw-rate of the target-vehicle at the present-time based on the present-range-rate, the present-azimuth, the prior-range-rate, and the prior-azimuth, and optionally the present-range and the prior-range, of each of the scattering-points. [A200]

"Systems, methods, and apparatus for living object protection in wireless power transfer applications"

Systems, methods, and apparatus for living object protection in wireless power transfer applications are provided. In one aspect, an apparatus for detecting objects in a detection area of a wireless power transfer system is provided. The apparatus comprises a plurality of radar transceivers. The apparatus comprises at least one processor configured to receive radar data from the plurality of radar transceivers, detect an object in the detection area based on the received radar data, and adjust the detection area. The apparatus is configured to adjust the detection area based on at least one of a type of chargeable vehicle present, an amount of power being wirelessly transferred by the wireless power transfer system, an alignment of a vehicle with the wireless power transfer system, or a speed of the object approaching the detection area. [A201]

"Operation of a vehicle by classifying a preceding vehicle lane"

Operating a host vehicle is described as including identifying remote vehicle information indicating at least a geospatial state for a remote vehicle and identifying host vehicle information indicating at least a geospatial state for the host vehicle. for a sequence of sampling points, a distance between the remote vehicle and the host vehicle within a transportation network is determined based on the remote vehicle information and the host vehicle information, an angle from a centerline extending from the host vehicle for the distance is calculated, the angle varying as a function of the distance, and a conically-shaped zone is determined using the angle. Responsive to the remote vehicle being located within the conically-shaped zone, the host vehicle is operated based on the remote vehicle being in a lane in which the host vehicle is traveling. The host vehicle is behind the remote vehicle in a direction of travel. A method, vehicle, and apparatus are described. [A202]

"Site-specific traffic analysis including identification of a traffic path"

A device for site-specific traffic analysis includes: a radar sensor at a traffic space, and an evaluation unit configured to (i) ascertain object trajectories from chronological sequences of object positions of respective objects detected by the radar sensor and moving in the traffic space, (ii) identify the location of at least one traffic path based on a concentration of object trajectories, and (iii) assign further detected objects to a respective traffic path whose location has been identified. [A203]

"Radar apparatus"

A radar apparatus is configured to derive information of a target in a vicinity of a host vehicle. The radar apparatus comprising a signal processor configured to: determine whether or not the target is a standstill object having an absolute speed less than a predetermined speed, determine whether or not the target determined as the standstill object is an upper object overhead of the host vehicle and with which the host vehicle cannot collide, and determine whether or not an environment for deriving target information is an adverse environment based on a frequency of determining existence of the upper object that also is the standstill object. [A204]

"Method and system for characterization of subsurface cavities using joint inversion of gravity and ground penetrating radar data"

A system and associated methodology determines the porosity and water saturation of a cavity using a joint inversion of gravity and ground penetrating radar data. The system exhibits high accuracy. In one embodiment, the cavity is spherical. [A205]

"Automated track projection bias removal using frechet distance and road networks"

A system and method for projecting target tracks produced by a remote tracker onto a surface of the Earth to obtain projected tracks is provided. Projection bias in a projected track from the remote tracker projected onto a planar map is removed by computing a discrete Frechet distance from a polygonal curve associated with a track derived from the remote tracker to a corresponding polygonal curve on the planar map. A correspondence between the projected track and a track on the planar map is automatically established. A projection bias is removed based on the correspondence. [A206]

"Object localization with RFID infrastructure"

Object localization with an radio-frequency identification (RFID) infrastructure is described. A plurality of transmission power levels established by an RFID reader can be searched to determine a measurement power level corresponding to a target. A region that includes the target can then be determined using information about a physical relationship between the RFID reader and a reference location via correlating the measurement power level to a reference power level corresponding to the reference location. [A207]

"Surroundings monitoring system, work vehicle, and surroundings monitoring method"

A surroundings monitoring system includes: a detection device that is disposed in a work vehicle and configured to be able to detect an object around the work vehicle, and a display device that is disposed in the work vehicle so as to display the work vehicle on a screen and display a detection area of the detection device in which an abnormality has occurred around the work vehicle on the screen. [A208]

"FTM protocol with angle of arrival and angle of departure"

Apparatuses and methods are disclosed that may perform ranging operations between an initiator device and a responder device. The initiator device may request the responder device to perform a ranging operation. The responder device may transmit a first fine timing measurement (FTM) frame to the initiator device, may receive an acknowledgement (ACK) frame from the responder device, and may transmit a second FTM frame to the initiator device. The second FTM frame may include a time value and angle information. The time value may indicate a difference between a time of departure (TOD) of the first FTM frame and a time of arrival (TOA) of the ACK frame. The angle information may indicate a direction of the initiator device relative to the responder device. The initiator device may determine its position, relative to the responder device, based at least in part on the received time value and angle information. [A209]

"Wet road surface condition detection"

A method for determining a wet surface condition of a road. Capturing an image of a wheel of a remote vehicle traveling in an adjacent lane by an image capture device of a host vehicle. Identifying in the captured image, by processor of a host vehicle, a region of interest relative to the wheel where the region of interest is representative of where precipitation dispersion occurs. A determination is made whether precipitation is present in the region of interest. A wet road surface signal is generated in response to the identification of precipitation in the adjacent lane. [A210]

"System and method for high-resolution radio occultation measurement through the atmosphere"

A constellation of individual satellites are employed to concurrently collect occultation data from multiple GPSS originating signals that pass through atmospheric sections of interest. By coordinating the collection and processing of the data using state of the art receivers on a constellation of low earth orbit satellites and networked processing, highly accurate calculation of atmospheric conditions and related future weather events are possible. [A211]

"Sensor-aided vehicle positioning system"

A method for localizing a vehicle in a digital map. GPS raw measurement data is retrieved from satellites. A digital map of a region traveled by the vehicle based on the raw measurement data is retrieved from a database. The digital map includes a geographic mapping of a traveled road and registered roadside objects. The registered roadside objects are positionally identified in the digital map by earth-fixed coordinates. Roadside objects are sensed in the region traveled by the vehicle using distance data and bearing angle data. The sensed roadside objects are matched on the digital map. A vehicle position is determined on the traveled road by fusing raw measurement data and sensor measurements of the identified roadside objects. The position of the vehicle is represented as a function of linearizing raw measurement data and the sensor measurement data as derived by a Jacobian matrix and normalized measurements, respectively. [A212]

"Weather data dissemination"

In some examples, a first entity is configured to request weather data for a region of interest from a second entity. The second entity may transmit the requested weather data to the first entity in response to receiving the request. In some examples, the second entity only transmits the weather data to the first entity only in response to receiving a specific request for the weather data. Conversely, the first entity may only receive the weather data from the second entity in response to transmitting a request for the weather data. [A213]

"Autonomous moving object"

An autonomous moving object includes: at least one distance sensor configured to detect distances to first and second positions located in a moving direction of the autonomous moving object on a road surface, and a determination unit configured to calculate a difference between a differential time between a time when the distance value to the first position detected by the at least one distance sensor is greater than a first threshold value and a time when the distance value to the second position is greater than a second threshold value and a moving time in which the autonomous moving object moves between the first and second positions and to determine that the distance sensor is abnormal only when the calculated difference is equal to or greater than a predetermined value. [A214]

"Vehicle with system for detecting arrival at cross road and automatically displaying side-front camera image"

A vehicle includes a proximity sensor that senses a distance to objects located to at least one side of the vehicle, a camera mounted at the front of the vehicle, a display for displaying video from the camera, and processing circuitry that detects a transition of the vehicle from surroundings of the vehicle in which at least one object located to the side of the vehicle is within a predetermined proximity threshold distance to surrounding of the vehicle in which no objects are located to the side of the vehicle within the predetermined proximity threshold distance, and in response to determining that, at least, the proximity sensor has detected the transition, the processing circuitry is configured to display video from the camera on the display of the vehicle. Additional criteria for displaying the video can include vehicle speed, distance traveled prior to the transition, duration for which the state prior to the transition was maintained, and the state of the vehicle's turn signal. [A215]

"Method for phase unwrapping using confidence-based rework"

A method, executed by one or more computers, for unwrapping phase wrapped data including a plurality of nodes. The method includes: selecting a root node from the plurality of nodes to start unwrapping (102) , selecting next nodes to be unwrapped, from the neighbor nodes of the root node, dynamically calculating a confidence factor for each node being unwrapped (104) , when a closed loop wherein one node can be unwrapped from either of two previously unwrapped nodes is encountered and an unwrapped value predicted by each of the prior nodes of the two nodes are different during unwrapping, comparing calculated confidence factors for the two previously unwrapped nodes (106) , using the compared confidence factors of the two previously unwrapped nodes to determine which one of the two nodes is an erroneous node (108) , and reprocessing the erroneous node to correct a previous unwrapping error (112) . [A216]

"System and method for detecting movement of a mobile asset and controlling operations of the asset based on its movement"

A system and method detect direction of movement. The system includes at least two radio frequency identification (RFID) readers arranged in different locations. The RFID readers transmit respective location signals from their locations and receive corresponding response signals from a portable electronic device (PED) when the PED is within range to receive the corresponding location signals, respectively. The system includes a controller configured to determine whether the individual response signals received by the RFID readers respectively satisfy a predetermined condition at a first time and a second time after the first time. The controller is configured to determine a direction of movement of the PED relative to the locations of the RFID readers during the first and second times based on whether the response signals respectively satisfy the predetermined condition at the first and second times, and control operations of the PED based on the determined movement of the PED. [A217]

"Ultrasound-based volumetric particle tracking method"

The disclosure relates to method of processing three-dimensional images or volumetric datasets to determine a configuration of a medium or a rate of a change of the medium, wherein the method includes tracking changes of a field related to the medium to obtain a deformation or velocity field in three dimensions. In some cases, the field is a brightness field inherent to the medium or its motion. In other embodiments, the brightness field is from a tracking agent that includes floating particles detectable in the medium during flow of the medium. [A218]

"Method and apparatus for creating perfect microwave absorbing skins"

A method and apparatus for producing a radio frequency absorber (RFA) or perfect microwave absorber (PMA) skin is described herein. A metamaterial layer may be applied to a low dielectric substrate. Resistive and capacitive components may then be added to the metamaterial layer. The metamaterial layer may then be formed into an RFA or PMA skin, which may then be applied to a multi-layered assembly for absorption of electromagnetic radiation in a frequency range such as the microwave frequency spectrum in a final product including but limited to cell phones, communication devices, or other electronic devices. [A219]

"Synchronization of vehicle sensor information"

A method includes receiving and storing operational data including a first plurality of data points indicative of a plurality of respective states of an operational parameter of the vehicle at a plurality of respective times, external data including a second plurality of data points indicative of a plurality of respective states of an environment external to the vehicle at a plurality of respective times, and synchronization data. The method also includes generating a virtual model of an event involving the vehicle using the stored data, at least by generating a first visual representation of the plurality of respective states of the operational parameter, generating a second visual representation of the plurality of respective states of the external environment, and using the synchronization data to cause the first visual representation to be displayed simultaneously with, and in a time-aligned manner with, the second visual representation. [A220]

"Apparatus and method for determining the elevation angle in a radar system"

The present method and system relates to the determination of elevation angles for the case in which more than one target object is situated within a radar cell. Through the estimation according to the present invention of the elevation angles in multi-target scenarios, even in such cases both azimuth angles and elevation angles can be determined, and a reliable classification of the respective target objects can then take place. The present system also relates to a motor vehicle having a radar system that includes an azimuth and elevation angle estimation method and system. [A221]

"Real aperture radar system for use on board a satellite and for maritime surveillance applications"

The present invention regards a method of operation of a real aperture radar system for surveillance of the Earth's surface, said real aperture radar system being installed on a space vehicle/platform that moves in a direction of flight and comprising a transceiving antenna, or a transmitting antenna and a receiving antenna, which is/are electronically steerable. All the radar pulses are transmitted: with a predefined pulse repetition frequency and a predefined timing of the scanning cycle such that to guarantee a complete coverage of each of the N swaths parallelly to the direction of flight, and by using a frequency agility technique. [A222]

"Method for measuring level of material level measuring apparatus"

A probe (14) of a material level measuring apparatus (10) inserts into a container (20) . The material level measuring apparatus (10) transmits an electromagnetic wave signal. When the electromagnetic wave signal touches a surface of a material (30) , a first reflected signal is generated. When the electromagnetic wave signal touches a bottom of the probe (14) , a second reflected signal is generated. According to the first reflected signal and the second reflected signal, a first time-passing difference value (t1) and a second time-passing difference value (t2) are obtained. According to the first time-passing difference value (t1) , the second time-passing difference value (t2) and a predetermined empty container time-passing difference value (t3) , a first material level and a second material level are obtained. According to the first material level and the second material level, a third material level is obtained. [A223]

"Vehicle front impact sensor with impact resistant carriage"

A vehicular radar assembly includes a radar mount positioned proximate an engine compartment within a vehicle. A radar carriage is slidably coupled to the radar mount and having a radar module coupled thereto. A biasing mechanism biases the radar carriage away from the radar mount toward a use position. Imposition of an impact force against the radar module temporarily overcomes the biasing mechanism and biases the radar carriage toward the radar mount. [A224]

"System and method for mobile data expansion and pedestrian obstacle detection"

A data expansion system that provides continuum of discrete wireless small cell coverage areas for electronic devices in vehicles includes a set of traffic control devices configured to provide communicate information regarding the presence of an obstruction in a vehicle or pedestrian path. The system includes a first traffic control device configured to communicate with an electronic device in a first vehicle. The system also includes a second traffic control device communicatively coupled to the first traffic control device. The second traffic control device is configured to detect a presence of an object. The second traffic control device also is configured to communicate the presence of the object to at least one of: a network controller, the first traffic control device, or another traffic control device. [A225]

"Multi-path mitigation in rangefinding and tracking objects using reduced attenuation RF technology"

An autonomous system with no Customer Network Investment is described, wherein the system is configurable to operate on in a band in addition to the LTE band. Such system allows the definition of hybrid operations to accommodate the positioning reference signals (PRS) of LTE and already existing reference signals. The system can operate with PRS, with other reference signals such as cell-specific reference signals (CRS) , or with both signal types. As such, the system provides the advantage of allowing network operator (s) to dynamically choose between modes of operation depending on circumstances, such as network throughput and compatibility. [A226]

"Vehicle radar system with a shared radar and communication system"

A shared radar and communication system for a vehicle includes capabilities for radar detection and communication with vehicles equipped with similar systems. The radar system is equipped with pluralities of transmit antennas and pluralities of receive antennas. The radar transmits a signal modulated with spread codes that are information bits. A receiver discriminates the signals sent from own transmitters and multiple reflections to detect objects of interest. In addition, the receiver discriminates signals transmitted from different systems on other vehicles. This requires the receiving system to have knowledge of the codes transmitted by the other vehicle. The receiving system determines the information bits sent by the other vehicle. If multiple radar systems on multiple vehicles use different sets of codes (but known to each other) , the multiple systems can create a communication infra-structure in addition to radar detection and imaging. [A227]

"Method for operating a radar sensor of a motor vehicle, driver assistance device and motor vehicle"

The invention relates to a method for operating a radar sensor (5, 6) of a motor vehicle (1) , in which for detecting a target object (12) in an environment of the motor vehicle (1) , a transmit signal (S) is emitted by means of the radar sensor (5, 6) and an echo signal reflected on the target object (12) is received as a received signal, wherein a plurality of sequences (13) each including a plurality of frequency-modulated chirp signals (14) is emitted one after the other by means of the radar sensor (5, 6) as the transmit signal (S) , and wherein a transmission pause (15) respectively follows each sequence (13) , in which the radar sensor (5, 6) does not emit any chirp signals (14) . The period of time of the transmission pauses (15) is respectively randomly adjusted in the operation of the radar sensor (5, 6) . [A228]

"Residue cancellation for automated vehicle MIMO radar"

A Pseudo-Random Phase Modulation (PRPM) multiple-input-multiple-output (MIMO) radar system suitable for use on an automated vehicle includes a first transmit-antenna that transmits a first transmit-signal generated by a first PRPM-code, a second transmit-antenna that transmits a second transmit-signal generated by a second PRPM-code, a receive-antenna used to detect a first reflected-signal arising from the first transmit-signal and a second reflected-signal arising from the second transmit-signal, and a controller. The controller is in communication with the receive-antenna and is operable to generate the first PRPM-code and the second PRPM-code. The controller is configured to generate a first sub-channel-output based on a down-converted-signal from the receive-antenna and the first PRPM-code, generate a second sub-channel-output based on the down-converted-signal from the receive-antenna and the second PRPM-code, determine a first residue-signal based on the second sub-channel-output, and determine a first residue-removed-signal by subtracting the first residue-signal from the first sub-channel-output. [A229]

"Method and device for sensing road environment based on frequency modulated continuous wave radar"

Disclosed herein are a method and device for sensing a road environment based on a frequency modulated continuous wave (FMCW) radar. A method for detecting a road environment based on the FMCW radar includes the steps of: the FMCW radar performing a first scan to acquire a first frequency spectrum of beat signals, and shifting the first frequency spectrum based on first velocity information of a vehicle on performing the first scan, the FMCW radar performing a second scan to acquire a second frequency spectrum of beat signals, and shifting the second frequency spectrum based on second velocity information of the vehicle on performing the second scan, acquiring correlation information between the shifted first frequency spectrum and the shifted second frequency spectrum, and comparing the correlation information with a set threshold value and detecting the road environment. [A230]

"Danger zone monitoring at a grade crossing"

In a method for identifying a danger zone to be monitored at a grade crossing, the following are performed: at least one radar sensor is situated at the danger zone, object trajectories from sequences over time of object positions of respective objects moving through the danger zone are ascertained by the radar sensor, the position of at least one traffic path is identified with the aid of an accumulation of object trajectories, the positions of barrier straight lines are ascertained with the aid of radar reflections of the closed barriers, and the danger zone is determined by linking information on the identified position of the at least one traffic path with information on the ascertained position of the barrier straight lines. [A231]

"Sensor handover"

A vehicle safety system including a detection system and a related method. The detection system is arranged to detect objects and includes at least two detectors. At least one control unit is arranged to determine that an object that is detected by an initial detector is classified as a confirmed object for the initial detector in its initial coverage area. The control unit is also arranged to determine whether at least one detection of another detector is from the same object. If so, a first preliminary detection of the other detector is classified as an intermediate low quality confirmed object for the other detector. A confirmed object is considered as a more reliable detection than a low quality confirmed object, which in turn is considered as a more reliable detection than a preliminary detection. [A232]

"Systems and methods for regulating weather information collection"

Systems and methods for regulating weather information collection are provided. In one embodiment, a method for managing the collection of weather information comprises: determining whether or not a weather data processing system is in a state open to receiving weather information, communicating to a first aircraft when the weather data processing system is in a state open to receiving weather information, and upon receiving weather information at the weather data processing system from the first aircraft, transmitting a signal indicating that the weather data processing system is not in a state open to receiving weather information. [A233]

"Apparatus and method for monitoring a target object"

Embodiments of the present invention provide monitoring apparatus for monitoring a target object external to a vehicle. The apparatus is operable to determine whether the target object is a valid target object in dependence on a value of a maximum range R.sub.max from the vehicle at which the target object has been detected. The apparatus may be operable to pre-arm a braking system and optionally apply a braking system responsive to a determination that a risk of collision exists. [A234]

"Blind area warning for vehicles"

Methods and devices are disclosed for assisting a driver of a first vehicle where a second vehicle is detected by a sensor of the first vehicle and a driver of the first vehicle is informed that the second vehicle is at the side of the first vehicle when the second vehicle leaves an area monitored by the sensor, the area monitored by the sensor being an area behind the first vehicle. [A235]

"System and method of underground water detection"

Embodiments of the invention are directed to a method of determining underground liquid (e.g., water) content. Embodiments of the method may include: receiving a scan of an area at a first polarization, the scan scans including first L band microwave reflections from the area. Embodiments of the invention may include receiving an optical data at a wavelength of 1 millimeter to 10 nanometers. Embodiments of the method may further include filtering electromagnetic noise from the scan using the optical data. Embodiments of the method may further include creating a water roughness map based on typical roughness values of various types of water sources and the filtered scan, identifying a first type of water sources using the water roughness map and the filtered scan and calculating the water content at locations in the area based on the identified first type of water sources. [A236]

"Digital frequency modulated continuous wave radar using handcrafted constant envelope modulation"

A radar system for a vehicle includes a transmitter and a receiver. The transmitter transmits an amplified and frequency modulated radio signal. Each transmitter comprises a frequency generator, a code generator, a modulator, a constant-envelope power amplifier, and an antenna. The frequency generator generates the radio signal with a desired center frequency. The code generator generates a sequence of chips at a selected chiprate. A modulation interval between successive chips is a reciprocal of the chiprate. The modulator frequency modulates the radio signal using shaped frequency pulses. The shaped frequency pulses correspond to a first signal, the frequency of which deviates from the desired center frequency during each of the modulation intervals according to a selected pulse shape. The selected pulse shape is determined by the generated sequence of chips. The constant-envelope power amplifier amplifies the frequency modulated radio signal at a desired transmit power level. The antenna transmits the radio signal. [A237]

"System and method for determining an orientation or position of a receiver relative to an emission device"

A method, device, system and use for determining a distance, location and/or orientation including the at least relative determination of a position of at least one object using at least two active anchors. A first signal is emitted by a first of the two anchors and is received at the object and by a second of said two anchors. A phase measurement is performed at said second anchor and wherein a distance determination with respect to said first anchor is performed and/or the distance from said first anchor to said second anchor is known. A second, particularly electromagnetic, signal is emitted from said second anchor, and information on phase measurement and distance between said first and second anchors is made available to a computation unit and at least one phase measurement respectively of said first and second signal is performed at said object and made available to said computation unit. [A238]

"Object detection apparatus"

In an object detection apparatus, a first region definition unit defines a first object region including a first detection point representing a relative position of a first object detected by a millimeter-wave radar with respect to a reference point in an XY-plane. An X-axis direction of the XY-plane is a vehicle widthwise direction, and a Y-axis direction of the XY-plane is a vehicle lengthwise direction. A second region definition unit defines a second object region including a second detection point representing a relative position of a second object detected based on a captured image with respect to the reference point. A region size modification unit modifies the size of the first region in the presence of axial misalignment of the radar. A determination unit determines that the first and second objects are the same if there is an overlap of the first and second object regions in the XY-plane. [A239]

"Method and system for avoiding a vehicle collision"

A vehicle includes a sensor device monitoring at least one collision region that is located in the surroundings of the vehicle for sensing at least one object that enters and/or is present in a possible collision region during motion of the vehicle, an electromechanical brake booster and braking force-regulating components coupled thereto, which are operationally integrated into a vehicle braking system for decelerating the vehicle, and a control device that receives signals from the sensor device and, on the basis of those signals, controls the brake booster and the braking force-regulating components and/or further active chassis components. A method for avoiding a collision between the vehicle and the at least one object includes, upon sensing the at least one object, modifying a driving speed and/or driving direction of the vehicle, with the aid of the control device in combination with the braking system and the braking force-regulating components. [A240]

"Systems and methods for measuring velocity with a radar altimeter"

Systems and methods for measuring velocity with a radar altimeter are provided. In at least one embodiment a method for measuring velocity magnitude of a platform in relation to a surface comprises transmitting a radar beam, wherein the radar beam is aimed toward a surface, receiving a plurality of reflected signals, wherein the plurality of reflected signals correspond to portions of the transmitted radar beam that are reflected by a plurality of portions of the surface, and applying Doppler filtering to the plurality of signals to form at least one Doppler beam. The method also comprises identifying range measurements within each Doppler beam in the at least one Doppler beam, and calculating the velocity magnitude based on the range measurements of the at least one Doppler beam. [A241]

"Vehicle type radar system, and method for removing an uninterested target"

According to an exemplary embodiment of the present invention, a vehicle type radar system includes: a camera unit configured to photograph a front of a vehicle to detect a lane, a radar unit configured to detect an object based on a reflected radar signal which is transmitted to the front of the vehicle and then returns and calculate a position, a speed, and a distance of the detected object, a sensor unit configured to detect weather conditions around the vehicle, a control unit configured to recognize a lane using the camera unit and recognize whether the detected object is a vehicle or a non-vehicle to perform a control to remove the object if it is determined that the detected object is the non-vehicle and display the recognized lane and vehicle, and a display unit configured to display the recognized lane and object. [A242]

"Side collision avoidance system and method for vehicle"

A side collision avoidance system and method for a vehicle combines data from radar sensors mounted on front and rear surfaces of the vehicle with data from ultrasonic sensors mounted on side surfaces of the vehicle, and detects obstacles on the basis of the combined data, so as to increase accuracy in the detection of obstacles and predict the probability of collisions with obstacles with high accuracy. The system includes: radar sensors detecting an obstacle around the vehicle, ultrasonic sensors detecting the obstacle around the vehicle, a controller combining sensor data from the radar sensors with sensor data from the ultrasonic sensors to generate combined data, detecting the obstacle on the basis of the combined data, and predicting collision or non-collision with the detected obstacle on the basis of the combined data, and a brake driver braking the vehicle when the collision is predicted. [A243]

"Method and device for controlling triggering of at least one passenger protection device for a motor vehicle and safety system for a vehicle"

A method for controlling triggering of at least one passenger protection device for a vehicle. The method includes a step of determining whether a signal level of at least one read-in impact signal, which represents a change in a vehicle condition indicating a potential collision of the vehicle with a potential accident object, exceeds an evaluation limiting value. The method also includes a step of using a high triggering threshold value for triggering of the at least one passenger protection device when the signal level of the at least one read-in impact signal exceeds the evaluation limiting value. [A244]

"Vehicle blind spot system operation with trailer tow"

This disclosure generally relates to a vehicle blind spot detection system, method, and module for adjusting parameters of a vehicle blind spot detection algorithm based on a trailer being attached to the back of the vehicle. More specifically, based on a determination that a trailer is attached to the vehicle and the reception of trailer information corresponding to the attached trailer, an adjust to the parameters of a blind spot detection area is disclosed for ensuring the continued operation of the blind spot detection feature will take into account the attached trailer. [A245]

"Method of adapting an automobile suspension in real-time"

Methods and systems for adapting an automobile suspension in real-time may include a radar module reading a surface topology ahead of a vehicle. A processor may convert an output signal of the radar module into a suspension input signal that corresponds to an amount by which a wheel suspension device of the vehicle should be adjusted to counteract the surface topology. The processor may adjust a mechanical attribute of the wheel suspension device in real-time based on the suspension input signal. In an embodiment, the processor may be configured to calculate the amount by which the wheel suspension device should be adjusted based on a speed of the vehicle and a size of the surface topology. In one embodiment, the radar module may include a gimbal mount configured to provide vertical and horizontal visibility to the radar module. [A246]

"Methods and systems for ranging protocol"

Disclosed are methods and systems for obtaining measurements of a range between devices in an exchange messages. In particular, described are techniques for transmitting messages between or among devices to share computed parameters indicative of ranges between devices. In particular implementations, shared computed parameters indicative of ranges between or among devices may enable computation of estimated locations of one or more of devices. [A247]

"Object recognition apparatus and vehicle travel controller using same"

The present invention provides an object recognition apparatus which, in a vehicle that detects an object present behind (including obliquely behind) the vehicle using a radio wave radar, is able to precisely recognize the position of the object present behind (including obliquely behind) the vehicle during traveling on a curve and a lane change, and a vehicle travel controller using the same. An object recognition apparatus is provided with: an image capturing unit which captures an image of an environment in front of a vehicle, a lane detection unit which detects a lane in front of the vehicle on the basis of the image captured by the image capturing unit, a lane position estimation unit which estimates the position of a lane behind the vehicle on the basis of the lane detected by the lane detection unit and the travel history of the vehicle, a rear object detection unit which detects an object present behind the vehicle, and a relative position calculation unit which calculates the relative position of the object detected by the rear object detection unit with respect to the position of the lane estimated by the lane position estimation unit. [A248]

"Orthogonal linear frequency modulation for MIMO radar"

Disclosed herein are embodiments that relate to phase coded linear frequency modulation for a radar system. Embodiments include transmitting at least one signal pulse with a binary phase shift keying (BPSK) encoding. The method also includes receiving a signal associated with reflection of the at least one transmitted signal pulse. The received signal may include at least two channels. Further, the method may also include processing the received signal to determine target information. The processing may include performing a despread operation that provides a phase offset based on a filtering range. Additionally, the processing may include performing a reconstruction operation that comprises creating a virtual spatial channel based on combining the two received channels. Yet further, the processing may include determining the target information based on the virtual spatial channel. An autonomous vehicle may be controlled based on the determined target information. [A249]

"Three dimensional radar system"

A system and a method of generating a three-dimensional terrain model using one-dimensional interferometry of a rotating radar unit is provided herein. Height information is evaluated from phase differences between two echoes by applying a Kalman filter in relation to a phase confidence map that is generated from phase forward projections relating to formerly analyzed phase data. The radar system starts from a flat earth model and gathers height information of the actual terrain as the platform approaches it. Height ambiguities are corrected by removing redundant 2.pi. multiples from the unwrapped phase difference between the echoes. [A250]

"FMCW radar having distance range graduation"

An FMCW radar sensor and method for determining information about distances and relative velocities of objects using an FMCW radar, in which a transmission signal's frequency is modulated as sequences of frequency ramps, the center points of the frequency ramps within a respective sequence lying on a higher-order ramp, a higher-order frequency spectrum being determined for at least one frequency position in frequency spectra of the baseband partial signals over the chronological sequence of amplitudes at the frequency position in the frequency spectra of the sequence of baseband partial signals, peaks in the at least one higher-order spectrum being represented by straight lines in a distance/velocity space, the respective slope of which is a function of the higher-order ramp's slope, and bands of the distance/velocity space of the respective peaks of the frequency positions in the frequency spectra of the baseband partial signals being considered in the frequency matching. [A251]

"Sensor calibration for autonomous vehicles"

Systems and methods for calibrating sensors for an autonomous vehicle are disclosed. A calibration guide disposed on the vehicle can indicate to a user the correct location for a calibration object to be placed for a calibration procedure. In one implementation, a laser guide can project an image indicating the correct location and orientation for the calibration object. In another implementation, an extendible arm disposed on the vehicle can suspend the calibration object at the correct location and orientation. In another implementation, an autonomous robot carrying the calibration object can autonomously bring the calibration object to the correct location. The calibration guide can be unobtrusively stored within the vehicle when not in use. [A252]

"Mandrel configuration monitoring system"

A method and system for monitoring a mandrel. A first plurality of transmitting devices is positioned with respect to the mandrel. Signals from a portion of the first plurality of transmitting devices are received at a receiving device. The signals are processed to determine a configuration of the mandrel. [A253]

"Very compact TM01 mode extractor"

A mode extractor for extracting TM01 mode from an electromagnetic signal, including a first and second turnstile junction, each of the turnstile junctions having first port, four second ports of rectangular waveguide which are mutually orthogonal and orthogonal to first port and matching section provided at least partially in center region of respective turnstile junction, center region being located at intersection of first port and four second ports wherein first and second turnstile junction are arranged so that longitudinal axes of their first ports are aligned with each other and their first ports are facing in opposite directions, each of the second ports of first turnstile junction is electromagnetically coupled to corresponding one of second ports of second turnstile junction, and a coaxial coupling device is inserted into matching section of first turnstile junction so that a portion of coaxial coupling device extends into first port of first turnstile junction. [A254]

"Mobile number plate recognition and speed detection system"

The invention which is mobile number plate recognition and speed detection apparatus (1) placed on the vehicles, i.e., police vehicle, with the aim of security, characterized in comprising camera (1.3) which is placed at two sides of the base--front right and front left--and enables the apparatus to capture image, LED lightings (1.4) which are disposed around the cameras (1.3) and face the direction of vision and provide capturing recognizable image at nights, police lights (1.5) which are placed to the front and rear surfaces of said base (1.2) and flash when necessary, alarm control device (1.8) adjusting the alarm, Ethernet connection (1.9) constituting the network, cooling device (1.10) eliminating the heat inside the apparatus, control card (1.11) controlling the police lights, 3G modem (1.12) providing wireless connection constantly, and upper cover (1.1) covering the entire apparatus by surrounding it. [A255]

"Apparatus and methods for sensing rainfall"

Aspects of the subject disclosure may include, for example, a rainfall sensor having a rainfall analyzer configured to induce transmitted electromagnetic waves that are guided by a transmission medium to propagate along the transmission medium, wherein the transmitted electromagnetic waves propagate without requiring an electrical return path, wherein the rainfall analyzer receives reflected electromagnetic waves from the transmission medium in response to the transmitted electromagnetic waves and wherein the rainfall analyzer analyzes the reflected electromagnetic waves and generates rainfall data in response thereto. Other embodiments are disclosed. [A256]

"Method and apparatus for pipe imaging with chemical analysis"

One embodiment provides a method for identifying a target object of a pipe wall, including: positioning a pipe inspection robot within a pipe, emitting, using a terahertz (THz) beam source of the pipe inspection robot, a laser beam towards a target object, receiving, using a THz receiver of the pipe inspection robot, THz data related to the target object, analyzing, using a processor, the THz data, and determining, based on the analyzing, an identity of the object. Other aspects are described and claimed. [A257]

"Autonomous emergency braking system and method of controlling the same"

Disclosed herein are an autonomous emergency braking system and a method of controlling the same, capable of autonomously performing emergency braking using information detected by a radar sensor. The autonomous emergency braking system includes a radar sensor and an ECU. The radar sensor transmits a radio wave and receives a wave reflected from an object in front of a vehicle, so as to detect the object in front of the vehicle. The ECU receives object detection information from the radar sensor, and stops or puts off autonomous emergency braking when the number of times the object is detected within a predetermined distance is equal to or greater than a predetermined number of times, based on the received object detection information. [A258]

"FTM protocol with angle of arrival and angle of departure"

Apparatuses and methods are disclosed that may perform ranging operations between an initiator device and a responder device. The initiator device may request the responder device to perform a ranging operation. The responder device may transmit a first fine timing measurement (FTM) frame to the initiator device, may receive an acknowledgement (ACK) frame from the responder device, and may transmit a second FTM frame to the initiator device. The second FTM frame may include a time value and angle information. The time value may indicate a difference between a time of departure (TOD) of the first FTM frame and a time of arrival (TOA) of the ACK frame. The angle information may indicate a direction of the initiator device relative to the responder device. [A259]

"Methods and systems for enhanced round trip time (RTT) exchange"

Disclosed are systems, methods and devices for obtaining round trip time measurements for use in location based services. In particular implementations, a fine timing measurement request message wirelessly transmitted by a first transceiver device to a second transceiver device may permit additional processing features in computing or applying a signal round trip time measurement. Such a signal round trip time measurement may be used in positioning operations. [A260]

"System and method to directly couple to analog to digital converter having lower voltage reference"

A device includes a variable gain amplifier, a voltage shifter, a variable gain amplifier half replica module, and an analog to digital converter. The variable gain amplifier includes an input terminal to receive an input signal, an output terminal to provide a first output signal that is biased based on a first common-mode voltage reference. The voltage shifter circuit includes first and second input terminals, and an output terminal to provide, to the analog to digital converter, a third output signal that is biased based on a second common-mode voltage reference. The variable gain amplifier half replica module includes an output terminal coupled to the second input terminal of the voltage shifter circuit, the variable gain amplifier half replica module to control the third output signal of the voltage shifter circuit based on the first common-mode voltage reference and the second common-mode voltage reference. [A261]

"Object detection apparatus"

In an apparatus for detecting and determining identicality of at least one object present within a region around a subject vehicle to be monitored, having a first detector adapted to detect the at least one object, a second detector adapted to detect the at least one object, and an identicality determiner adapted to determine whether the at least one object detected by the first and second detectors are identical, it is configured that the identicality determiner determines that, when the first detector detects the objects in a plural number in a first direction and the second detector detects the object in a single number in a second direction that is same as the first direction, one among the objects ahead and nearest to the subject vehicle detected by the first detector and the object detected by the second detector are identical. [A262]

"System and method for location estimation in environments unsuitable for GPS technology"

A device and method for providing location estimations. The device may be configured to estimate its location by transmitting and/or receiving signals of respective transmission ranges. The device may also be configured to transition from a client device operational mode to a location beacon operational mode once an accurate location estimation has been obtained. [A263]

"Device for locating one or more mobile elements in a predetermined zone, and method implemented in such a device"

A method for locating a mobile element in a predetermined zone, including supplying power to an on-board module in the mobile element, where the on-board module includes an electronic circuit and an on-board coil, generating a locating signal by the electronic circuit and transmission of the locating signal via the on-board coil, picking up the locating signal by receiver coils on a support in proximity to the predetermined zone, each of the receiver coils configured to pick up the locating signal when the mobile element is in proximity, and determining a location of the mobile element in the predetermined zone by detecting a signal level on the support in the form of an array by a processing unit connected to the support. The electronic circuit and the on-board coil constitute an RLC circuit that oscillates, generating the locating signal by sudden interruption of the current through the on-board coil. [A264]

"On-board communication system, and on-board device"

In an on-board communication system, an on-board device transmits detection signals from a plurality of antennas provided in a vehicle, and a plurality of portable devices transmits response signals corresponding to the received detection signals. The on-board device performs position detection of the portable devices by receiving the response signals transmitted from the portable devices. Prior to transmission of the detection signals, the antennas transmit a processing start signal. The processing start signal and the detection signals are signals received in common by the plurality of portable devices. Each portable device includes a portable reception unit that receives the detection signals, and a portable transmission unit that, when the portable reception unit has received the detection signals, transmits the response signals, which include information corresponding to the received detection signals. [A265]

"Humidity estimation"

A computing device determines that a first time for a first sound generated by a vehicle to reach a first sound maximum amplitude and a second time for a second sound generated by the vehicle to reach a second sound maximum amplitude are within a range. An object that reflects the second sound is identified based on an interval between receipt of the first and second sounds. A speed of sound is determined based at least in part on the time interval and a distance to the object. A humidity is determined based at least in part on the speed of sound. A vehicle subsystem is adjusted based on the humidity. [A266]

"Electromagnetic wave penetrative metal film, manufacturing method of electromagnetic wave penetrative metal film, and radome for vehicle-mounted radar devices"

An object of the present invention is to provide an electromagnetic wave penetrative metal film having high mass productivity and an extremely low attenuation rate in the electromagnetic wave penetrated through, a manufacturing method of the electromagnetic wave penetrative metal film, and a radome for a vehicle-mounted radar devices using the electromagnetic wave penetrative metal file. To achieve the object, the present invention provides an electromagnetic wave penetrative metal film composed of more than 10000 of fine metal film pieces per unit area (1 mm.sup.2) provided on a surface of a substrate through an electroless plating step, wherein fine metal film pieces adjacent to each other are electrically isolated, a manufacturing method of the electromagnetic wave penetrative metal film, and a radome for a vehicle-mounted radar devices using the electromagnetic wave penetrative metal film. [A267]

"Detection of overhanging objects"

An autonomous vehicle can encounter an external environment in which an object overhangs a current road of the autonomous vehicle. for example, the branch of a tree may overhang the road. Such an overhanging object can be detected and suitable driving maneuvers for the autonomous vehicle can be determined. Sensor data can be acquired from at least a forward portion of the external environment. One or more floating obstacle candidates can be identified based on the acquired sensor data. The identified one or more floating obstacle candidates can be filtered to remove any floating obstacle candidates that do not meet one or more predefined parameters. A driving maneuver for the autonomous vehicle can be determined at least partially based on a height clearance between the autonomous vehicle and floating obstacle candidates that remain after being filtered out. The autonomous vehicle can be caused to implement the determined driving maneuver. [A268]

"Method for positioning a vehicle"

A method for positioning a vehicle includes deriving an estimated position of the vehicle by way of a satellite signal received from the vehicle, receiving a correction signal from a second vehicle, and correcting the estimated position by way of the correction signal. [A269]

"Apparatus and method for high speed subsurface inspection of built infrastructure"

A ground penetrating radar antenna array is consistently maintained at a spacing of less than or equal to about 4 inches above the target surface. As a result, the antenna array may be moved up to 75 mph while maintaining accuracy of data collection. The apparatus includes a wooden support from which non-elastic straps are suspended. The straps are attached to a housing containing the ground penetrating radar antenna array and receiver. The housing is supported from below by a pair of skis that have wear plates attached to their undersides with the wear plates engaging the target surface. The wear plates maintain the distal ends of the antennas within the antenna array at a spacing from the target surface of less than or equal to 4 inches, preferably 3.75.+-.0.25 inches. The method of operation is also disclosed. [A270]

"Method and a device for surface determination by means of microwaves"

An apparatus comprises: (1) measuring unit configured to transmit a signal towards the object and to determine a plurality of voxels, each comprising phase and magnitude of a reflected signal and spatial coordinates (comprising Z-axis, X-axis and Y-axis) , and the voxels comprise a plurality of series of voxels along the Z-axis, each having a same X-coordinate and a same Y-coordinate, and (2) surface-determining unit comprising (a) magnitude unit configured to determine a maximum magnitude voxel for each series of voxels, (b) phase unit configured to determine, for each maximum magnitude voxel, phases of at least three voxels (maximum magnitude voxel and voxels adjacent thereto) , (c) angle unit configured to determine, for each maximum magnitude voxel, a normal vector based on the respective phases, and (d) reconstructing unit configured to determine the object surface based on the spatial coordinates of the maximum magnitude voxels and the respective normal vectors. [A271]

"Humanized steering model for automated vehicles"

A humanized steering system for an automated vehicle includes one or more steering-wheels operable to steer a vehicle, an angle-sensor configured to determine a steering-angle of the steering-wheels, a hand-wheel used by an operator of the vehicle to influence the steering-angle and thereby manually steer the vehicle, a steering-actuator operable to influence the steering-angle thereby steer the vehicle when the operator does not manually steer the vehicle, a position-sensor operable to indicate a relative-position an object proximate to the vehicle, and a controller. The controller is configured to receive the steering-angle and the relative-position, determine, using deep-learning techniques, a steering-model based on the steering-angle and the relative-position, and operate the steering-actuator when the operator does not manually steer the vehicle to steer the vehicle in accordance with the steering-model, whereby the vehicle is steered in a manner similar to how the operator manually steers the vehicle. [A272]

"Radar mounting device"

An exemplary radar mounting device for attaching a component to a vehicle body may include a resilient grommet secured within an opening formed in the component. The device may also have a stud for attachment to the vehicle body. The stud may have a ball portion received within the resilient grommet for attaching the component to the stud. In addition, the device may have a nut fastened to the stud to secure the component to the stud. [A273]

"Partially synchronized multilateration or trilateration method and system for positional finding using RF"

Systems and methods for determining a location of user equipment (UE) in a wireless system can comprise receiving reference signals via a location management unit (LMU) having two or more co-located channels, wherein the two or more co-located channels are tightly synchronized with each other and utilizing the received reference signals to calculate a location of the UE. Some systems may include multichannel synchronization with a standard deviation of less than or equal 10 ns. Some systems may include two LMUs, with each LMU having internal synchronization, or one LMU with tightly synchronized signals. [A274]

"Occluded area detection with static obstacle maps"

Ray tracing and static obstacle maps can be used in the operation of a vehicle. Sensor data of at least a portion of an external environment of the vehicle can be acquired. A dynamic obstacle in the external environment of the vehicle can be detected based on the acquired sensor data. In response to detecting a dynamic obstacle, it can be determined whether a secondary occluded area is located behind the dynamic obstacle relative to a current location of the vehicle based on a static obstacle map. Responsive to determining that a secondary occluded area is located behind the dynamic obstacle relative to a current location of the vehicle based on a static obstacle map, a driving maneuver for the vehicle can be determined based on at least the dynamic obstacle and the secondary occluded area. The vehicle can be caused to implement the determined driving maneuver. [A275]

"Method for mapping the surroundings of a vehicle"

A method for mapping surroundings of a vehicle, objects in the surroundings of the vehicle being detected with the aid of sensors and particular detected objects being described by two coordinate points and also by a position fuzziness assigned to the particular coordinate point, the coordinate points and the position fuzziness values being stored in an interface in the form of data which may be accessed by driver assistance systems of the vehicle. A method is also described for ascertaining the collision probability of a vehicle with an object, in which the surroundings of the vehicle are initially mapped using the method for mapping the surroundings of a vehicle, a travel path to be traveled by the vehicle is ascertained in a subsequent step, and the degree of overlap between the object and the travel path and also the collision probability are finally determined, taking the position fuzziness into account. [A276]

"Advanced techniques for ground-penetrating radar systems"

A Ground Penetrating Radar (GPR) system makes use of digital circuitry for synchronizing the sampling of a received radar signal with a transmitted radar signal. The digital synchronization achieves improved waveform reproduction and greater receiver sensitivity. Furthermore, the system employs digital circuitry to control the gain of a receiver amplifier. The digitally controlled gain makes it possible to accurately calibrate the amplitude of received radar signals with great precision while achieving good dynamic range. [A277]

"Enhanced detection and automatic signature extraction of radar resonance reflections in above and below-ground man-made objects"

A system and method for processing radar returns to identify returns from man-made objects. In one embodiment, a plurality of radar returns is used to form a corresponding plurality of resonance maps, which are combined using an ordered statistic to form a processed resonance map. A discriminant is calculated as (a) the fourth power of the ratio of (i) the power in a first rectangle about each pixel to (ii) the power in a region outside the first rectangle and inside a second, larger rectangle, or (b) zero if the ratio is less than 1. Other processing operations including thresholding operations to suppress noise and clutter are used to improve the signal to noise ratio for detecting man-made objects. [A278]

"Speed calculating device and speed calculating method, and collision determination device"

A speed calculating device calculates the speed of an object around a moving body and includes: an image detection unit that captures an image of the surroundings of the moving body and detects the object from the captured image, and a speed calculation unit that calculates the speed of the object, using a moving body speed indicating the speed of the moving body and an image speed, which indicates the speed of the object and is calculated from the image, at a ratio corresponding to a distance from the moving body to the object. The speed calculation unit calculates the speed of the object using the moving body speed and the image speed such that the ratio of the moving body speed increases as the distance to the object increases and the ratio of the image speed increases as the distance to the object decreases. [A279]

"Method for processing environmental data in a vehicle"

Sensor information is processed in a vehicle by transforming sensor data acquired with at least one sensor of the vehicle from a current environment of the vehicle into a curved coordinate system, by continuously updating the sensor data while the vehicle is moving, and by dynamically adapting the curved coordinate system to a current situation of the vehicle. [A280]

"Radio-frequency system"

A radio-frequency (RF) system includes a substrate, a plurality of antenna strings, formed on a first plane of the substrate, each comprising a plurality of radiating units connected in a sequence, wherein the plurality of antenna strings are classified into a first group and a second group, a plurality of wires, formed on a second plane of the substrate, for transmitting RF signals, a plurality of connecting units, disposed in the substrate, for coupling the plurality of wires and antenna strings of the second group, a first RF processing module, for transmitting or receiving RF signals via antenna strings of the first group, and a second RF processing module, for coupling to the antenna strings of the second group through the plurality of wires and the plurality of connecting units, so as to transmit or receive RF signals via the antenna strings of the second group. [A281]

"Boundary signal detection"

A boundary signal detection system distinguishes a valid boundary signal for a target region from an extraneous boundary signal for a neighboring region. The system includes electronics that convert the candidate signal from a time domain to a frequency domain to identify at least one embedded frequency in the candidate, that compare the at least one embedded frequency in the candidate signal to at least one predetermined embedded frequency of the valid boundary signal, and that identify the candidate signal as the valid boundary signal based upon the comparison. [A282]

"Vehicle motion estimation enhancement with radar data"

Methods and systems for estimating motion of a vehicle are provided. Radar data pertaining to one or more stationary objects in proximity to the vehicle are obtained via one or more radar units of the vehicle. The motion of the vehicle is estimating using the radar data via a processor of the vehicle. [A283]

"Method and devices for detecting and rectifying problems in connection with a vehicle load"

In a method for recognizing a load state and for removing problems that may result from such a load state of a vehicle, measures are provided for recognizing the overall vehicle mass and/or load mass of a vehicle as well as for detecting a non-uniform load of a vehicle, and reaction possibilities are provided for the functionality, impaired by such a load, of a distance sensor situated on the vehicle. [A284]

"Apparatus, system and method of estimating a location of a mobile device"

Some demonstrative embodiments include devices, systems and/or methods of estimating a location of a mobile device. for example, an apparatus may include a controller to control a first wireless communication device to communicate a probe request with a second wireless communication device and to communicate a probe response with the second wireless communication device, wherein the probe response includes a delay value representing a delay period between a reception of the probe request and a transmission of a frame in response to the probe request. [A285]

"Vehicle driving assistance apparatus"

A vehicle driving assistance apparatus has a sensor that detects an object around an own vehicle, and a processing apparatus that determines whether the object detected by the sensor is a static vehicle or a roadside static object, carries out driving assistance if a first driving assistance carrying-out condition is satisfied when determining as a static vehicle and carries out the driving assistance if a second driving assistance carrying-out condition is satisfied when determining as a roadside static object. A threshold concerning the first driving assistance carrying-out condition is lower than a threshold concerning the second driving assistance carrying-out condition. [A286]

"Method for detecting interference in a received signal of a radar sensor, driver assistance device and motor vehicle"

A method for detecting interference in a received signal received by a radar sensor of a motor vehicle is disclosed. for detecting a target object in an environment of the motor vehicle, a transmit signal is emitted by the radar sensor, which includes a sequence of consecutive frequency-modulated chirp signals. The radar sensor then receives an echo signal reflected on the target object as the received signal with the superimposed interference. After receiving the received signal, the interference in the chirp signals of the received signal is detected. [A287]

"Driving assistant system of vehicle and method for controlling the same"

Disclosed herein are a driving assistant system of a vehicle and a driving assistant method. The driving assistant system includes an image acquisition unit that acquires a front image of the vehicle, an obstacle detection unit that detects an obstacle at lateral and rear sides of the vehicle, a determination unit that determines whether a current vehicle is located at a junction road based on the acquired image, and a control unit that automatically changes a lane of the vehicle when it is determined that the current vehicle is located at the junction road and the obstacle is not detected at the lateral or rear side of the vehicle. [A288]

"Systems and methods for hazard mitigation"

A system and method to avoid collisions on highways, and to minimize the fatalities, injury, and damage when a collision is unavoidable. The system includes sensor means to detect other vehicles, and computing means to evaluate when a collision is imminent and to determine whether the collision is avoidable. If the collision is avoidable by a sequence of controlled accelerations and decelerations and steering, the system implements that sequence of actions automatically. If the collision is unavoidable, a different sequence is implemented to minimize the overall harm of the unavoidable collision. The system further includes indirect mitigation steps such as flashing the brake lights automatically. An optional post-collision strategy is implemented to prevent secondary collisions, particularly if the driver is incapacitated. Adjustment means enable the driver to set the type and timing of automatic interventions. [A289]

"Electromagnetic wave sensor and/or emitter"

Provided is a device for performing at least one of detection and emission of electromagnetic waves, including a plurality of antennas, in which a first antenna includes a first radiating element and a first electronic element electrically connected to the first radiating element, and is sensitive to a first frequency band, and in which a second antenna includes a second radiating element and a second electronic element electrically connected to the second radiating element, and is sensitive to a second frequency band. At least a part of the second radiating element is arranged inside the first radiating element. [A290]

"Apparatus and method for detecting target in periphery of vehicle"

An on-vehicle target detection apparatus is provided. The apparatus includes a radar sensing portion and a processing unit that processes information from the radar sensing portion. The processing unit detects a target that is present in the periphery of the vehicle based on detection results from the radar sensing portion, and determines a depth determination value indicating the depth of the target detected. The processing unit compares the depth determination threshold and a threshold set in advance and determines that the target is a low-lying target that is surmountable by the vehicle, when the depth determination value is determined to be less than the threshold. [A291]

"System and method for neutralizing shaped-charge threats"

The invention relates to an interceptor type system for neutralizing a shaped charge threat, which comprises: (a) a detection system for detecting an approach of a shaped charge projectile, for calculating upon such detection its course of approach, and for activating an interceptor to create a flux of intercepting fragments within a destruction corridor, and (b) one or more of said interceptors, each comprising one or more magazines of fragments, each magazine comprises said fragments and an explosive layer which in turn explodes thereby to create said flux of intercepting fragments within said destruction corridor. [A292]

"Confidence estimation for predictive driver assistance systems based on plausibility rules"

The invention relates to a driving assistance system including a prediction subsystem in a vehicle. According to a method aspect of the invention, the method comprises the steps of accepting an environment representation, calculating a confidence estimate related to the environment representation based on applying plausibility rules on the environment representation, and providing the confidence estimate as input for an evaluation of a prediction based on the environment representation. [A293]

"Detection of a target object utilizing automotive radar"

Systems and methods are presented herein for improved cross-path detection between a host vehicle and a target object. In general, the cross-path angle by solving a multiple hypothesis problem characterized by independent calculations across a first plurality of time points, the multiple hypothesis problem supposing a plurality of possible cross-path angle solutions, each cross-path angle solution representing a corresponding possible trajectory for the target object. Advantageously, a cross-traffic alert or other feedback may be triggered based at least partially on whether the target object is within a region of interest, wherein the region of interest is determined at least in part based on the estimated cross-path angle. In some embodiments the cross-path angle may be determined by selecting a cross-path angle solution from the plurality of possible cross-path angle solutions which minimizes a variance between results of the independent calculations across the first plurality of time points. Other feature disclosed herein include, determining an estimate for the cross-path angle for each of a plurality of trackings of the target object, wherein each tracking is characterized by a different set of two or more time points. This may advantageously enable, determining a change in trajectory of the target object based on variance between cross-path angle estimates. [A294]

"Transducer array having a transceiver"

Various implementations described herein are directed to a transducer array. The transducer array may include a first receiver having a first aperture width. The transducer array may include a second receiver having a second aperture width that is substantially equal to the first aperture width. The transducer array may also include a transceiver having a third aperture width that is larger than the first aperture width and the second aperture width. [A295]

"Lane change detection"

The present invention relates to a vehicle safety system and method including a detection system, an emergency control unit and one or more safety devices. The detection system detects a target vehicle positioned longitudinally and laterally displaced relative the detection system, and defines a target vehicle rectangle that at least partly encloses the target vehicle, and constitutes an approximation of the target vehicle. The target vehicle rectangle forms a boundary (k) positioned along a second bearing having a second azimuth angle (.delta.'.sub.1+.delta.'.sub.2) with reference to a first reference line. The target vehicle rectangle forms a first corner (j) closest to the detection system and positioned along a first bearing having a first azimuth angle (.delta.'.sub.1) with reference to the first reference line. The detection system calculates a yaw movement (.theta..sub.A) of the target vehicle using the first and second azimuth angles (.delta.'.sub.1, .delta.'.sub.1+.delta.'.sub.2) . [A296]

"Vehicle sensor compensation"

Methods and systems for vehicle sensor compensation are provided. A sensor is configured to at least facilitating obtaining sensor data pertaining to an object in proximity to the vehicle. The sensor data includes a measured azimuth angle value for the object. A processor is coupled to the sensor. The processor is coupled to the sensor, and is configured to at least facilitate estimating a misalignment angle for the sensor using the sensor data and generating a correction factor for the measured azimuth angle value using the misalignment angle. [A297]

"Methods and systems for encoded broadcasting and antenna reception, particularly for radar"

To reduce radar cells and to improve the detection of a radar system, particularly a high-frequency surface wave radar (HFSWR) , the broadcast system (SEM) is capable of broadcasting basic orthogonal signals two by two and each orthogonal to itself, temporally shifted to form, respectively, broadcast radiation patterns, each including main radiation lobes (LP.sub.1, LP.sub.N) alternating with secondary lobes, the main lobes associated with the basic signals being substantially juxtaposed in space. The receiving system (SRE) is capable of forming as many reception patterns in a monitored receiving area (ZR) as cells (CES.sub.n'm) contained in the receiving area that are covered by main radiation lobes (LP.sub.n) from one of the broadcast radiation patterns and located at a bistatic distance from the broadcast and receiving systems. [A298]

"Travel control device"

A travel control device 10 includes: an intersection stopped vehicle determining unit 12 that determines whether or not a forward vehicle is a stopped vehicle that is stopped at an intersection, based on distance information from the own vehicle to each forward vehicle acquired by a forward vehicle detection device 1, and distance information to the intersection existing ahead of the own vehicle acquired by a forward intersection distance acquisition device 2, and a vehicle stop position prediction unit 13 that predicts a stop position of the own vehicle at the intersection based on distance information of the stopped vehicle, when the forward vehicle is determined as the stopped vehicle. [A299]

"Driver supporting device and warning timing control method"

Disclosed is a driver supporting device including: a warning timing control unit for setting a timing at which to output warning data in accordance with the existence or non-existence of a passenger when it is determined that a warning target which possibly collides with a driver's vehicle exists ahead of the driver's vehicle, and a warning data outputting unit for outputting the warning data in accordance with the timing set by the warning timing control unit. [A300]

"Method and system for localizing a vehicle and vehicle with a device for carrying out vehicle-to-X communications"

A method for localizing a vehicle using vehicle-to-X communications is disclosed which provides improved position data. Signals from at least one object arranged outside a vehicle are received using a receiving unit arranged in the vehicle. A signal strength of the received signals is respectively measured and first position data of the vehicle is obtained by utilizing a determined position of using object. Second position data is determined based on the first position data. The signal strength or a change in the received signal strength is incorporated into the determination of the second position data. [A301]

"Wireless proximity sensor with a target device comprising an inverter"

A target device for use with a switch device of a proximity switch has a wireless receiver means (6) for detecting and receiving a first pulsating signal (A) with a first carrier frequency (f1) from a nearby transmitter module (5) , demodulating (6, 7) the received signal, and if a superimposed digital signal is present, inverting (9, 10, C4, and Q1) the superimposed received digital signal or, if the superimposed digital signal is absent, passing the existing energy through (10) . The target device also has a wireless transmitter means (12) for modulating and sending the inverted pulse train if this exists by the second carrier frequency (f2) to the receiver switch unit (13) . Additionally, the target comprises functionality to transmit the carrier frequency (f2) continuous and unmodulated where a continuous and unmodulated carrier frequency (f1) is present. However, upon existence of the pulsating signal only one of the receiver (6) and the transmitter (12) receives or transmits a signal at a given time. [A302]

"Object determination using a radar sensor"

A method for determining an object in a surroundings of a motor vehicle includes: scanning a far range, which extends as of a predetermined minimum distance from the radar sensor, using a radar sensor for scanning the far range, detecting objects in the far range based on reflections of a radar signal emitted by the radar sensor, and determining a crossing object in a close range, which lies between the radar sensor and the far range, if a previously detected object is no longer able to be detected in the far range using the radar sensor. [A303]

"Radar for vehicle and method of operating the same"

Disclosed herein is a vehicle radar. The radar may include Tx antennas for a middle range, Tx antennas for a short range, Rx antenna columns for a middle range each configured to have a long shape vertically and be horizontally disposed, Rx antenna columns for a short range each configured to have a long shape vertically and be disposed between some of the Rx antenna columns for a middle range, and a control unit configured to process signals of radio waves that are reflected from a specific object after the radio waves are radiated by the Tx antennas for the middle range and that are received by the Rx antenna columns for the middle range or signals of radio waves that are reflected from a specific object after the radio waves are radiated by the Tx antennas for the short range and that are received by the Rx antenna columns for the short range. [A304]

"Test device and imaging device including the same"

A test device includes a plurality of transceivers that respectively transmit a wave to a test target point of a test object, respectively receive a wave reflected, scattered, or refracted from the test object, and respectively output a signal generated in response to the received wave, a combiner that combines the plurality of received signals generated by the plurality of transceivers, and a plurality of switches that are opened or closed to transfer the plurality of received signals to the combiner or block the plurality of received signals from being transferred to the combiner. [A305]

"Long range steerable LIDAR system"

Systems and methods are described that relate to a light detection and ranging (LIDAR) device. The LIDAR device includes a fiber laser configured to emit light within a wavelength range, a scanning portion configured to direct the emitted light in a reciprocating manner about a first axis, and a plurality of detectors configured to sense light within the wavelength range. The device additionally includes a controller configured to receive target information, which may be indicative of an object, a position, a location, or an angle range. In response to receiving the target information, the controller may cause the rotational mount to rotate so as to adjust a pointing direction of the LIDAR. The controller is further configured to cause the LIDAR to scan a field-of-view (FOV) of the environment. The controller may determine a three-dimensional (3D) representation of the environment based on data from scanning the FOV. [A306]

"Method and system for lane detection and validation"

A method and system for lane recognition including determining availability of vehicle position data obtained from more than one source including a GPS device source and an imaging device source. The method includes modifying a lane error threshold based on the availability of the vehicle position data. The lane error threshold is a lateral distance from a centerline of a lane. The method includes validating lane recognition data based on the lane error threshold. [A307]

"Determining a location of a disconnected device"

Described herein are techniques for determining a location of a disconnected device. In an example, a method includes instructing a first access point to sniff a wireless channel for probe request packets from disconnected devices, and instructing the first access point to send a distance-probing packet to a disconnected device after receiving a probe request packet from the disconnected device. The method further includes receiving, from the first access point, a MAC address of the disconnected device determined from the received probe request packet. After receiving the MAC address from the first access point, a group of access points is instructed to send distance-probing packets to the disconnected device. The method further includes receiving, from the first access point and the group of access points, time-of-flight measurements associated with the disconnected device. A location of the disconnected device can be determined using the time-of-flight measurements. [A308]

"Antenna device and method for operating an antenna device"

An antenna device is disclosed including a control means and at least two transmission means in predeterminable positions and at least two receiving means in predeterminable positions. The control means is set up in such a way that it alternately individually excites the at least two transmission means in transmission, in such a way that each of the at least two receiving means receives a transmitted signal generated by each of the at least two transmission means. The control means is further set up to excite the at least two transmission means jointly in transmission at a predeterminable moment in such a way that each of the at least two receiving means receives a transmission signal generated by a single virtual transmission means. [A309]

"Automated un-manned air traffic control system"

A low flying unmanned vehicle is disclosed that may be able to determine whether a collision is possible and may take evasive action in response to the possible collision. The vehicle may wirelessly communicate and may use a standard protocol such that a variety of additional objects may be taken into account when determining the possible collision risk. [A310]

"Radar apparatus"

A radar apparatus derives (i) first target information of a first target existing in the transmission range of the transmission wave, the first target being a rear end portion of a vehicle and (ii) second target information of a second target existing in the transmission range of the transmission wave, the second target being a portion of the vehicle other than the rear end portion of the vehicle. The radar apparatus calculates a distance difference between the first target and the second target, and predicts, in a case where the first target information of the first target derived in a previous target information derivation process is not derived in a latest target information derivation process, a position of the first target, using the distance difference and the second target information of the second target derived in the latest target information derivation process. [A311]

"Deceleration hysterisis measuring apparatus for soft recovery system"

A deceleration hysteresis measuring apparatus for a soft recovery system is configured to transmit an electromagnetic wave to a pressure tube of the soft recovery system and receive the electromagnetic wave reflected from a projectile moving in the pressure tube so as to measure a distance of the projectile based on signals of the transmitted and received waves. [A312]

"Electromagnetic reflection profiles"

Methods, systems, and products determine electromagnetic reflective characteristics of ambient environments. A wireless communications device sends a cellular impulse and receives reflections of the cellular impulse. The cellular impulse and the reflections of the cellular impulse may be compared to determine the electromagnetic reflective characteristics of an ambient environment. [A313]

"Using an MM-principle to achieve fast image data estimation from large image data sets"

A majorize-minimize (MM) mathematical principle is applied to least squares regularization estimation problems to effect efficient processing of image data sets to provide good quality images. In a ground penetrating radar application, these approaches can reduce processing time and memory use by accounting for a symmetric nature of a given radar pulse, accounting for similar discrete time delays between transmission of a given radar pulse and reception of reflections from the given radar pulse, and accounting for a short duration of the given radar pulse. [A314]

"Alarm system and method for vehicle"

An alarm system for a vehicle comprises a sensor disposed on an installation plane of the vehicle, configured to emit a plurality of frequency-modulated continuous waveform (FMCW) signals toward a reverse plane of the installation plane and receiving reflected signals of the plurality of FMCW signals, to detect information of a plurality of targets within a specified range corresponding to the vehicle, an alarm being controlled to generate an alarm signal, and a control module coupled to the sensor and the alarm, capable of receiving the information of the plurality of targets detected by the sensor, determining a vehicle information of the vehicle in relation to an external environment according to the information of the plurality of targets, and determining movement statuses of the plurality of targets in relation to the vehicle according to the vehicle information and the information of the plurality of targets, and accordingly controlling the alarm. [A315]

"Virtual radar configuration for 2D array"

A radar sensing system for a vehicle includes a plurality of transmitters, a plurality of receivers, and a plurality of receive and transmit antennas. The plurality of transmitters are configured for installation and use on a vehicle, and operable to transmit radio signals. The plurality of receivers are configured for installation and use on the vehicle, and operable to receive radio signals which include transmitted radio signals reflected from objects in the environment. The plurality of receive antennas and the plurality of transmit antennas are arranged in a selected MIMO configuration to provide a quantity of receive antennas and transmit antennas for a desired level of two-dimensional angle capability for a given board size. [A316]

"Motion detector device"

The present invention relates to a motion detector device comprising a receiver arranged for reception of at least one electromagnetic signal constituted by a corresponding transmitted electromagnetic signal being transmitted by a corresponding source and influenced by a corresponding channel. The motion detector device comprises predetermined information regarding each transmitted electromagnetic signal. The motion detector device further comprises analyzing means arranged to analyze all components of the received signal to determine how certain parameters of each transmitted electromagnetic signal are influenced by each corresponding channel by means of the predetermined information. The analyzing means is also arranged to analyze the temporal variation of said certain parameters during a certain time. It is determined if said temporal variation exceeds a predetermined threshold. The present invention also relates to a corresponding method. [A317]

"Construction machine control system, construction machine, construction machine management system, and construction machine control method and program"

A construction machine control system for a construction machine that travels along a travel route, includes: a position detection unit that detects a position of the construction machine, a determination unit that determines whether an error in the position detected by the position detection unit is equal to or smaller than a predetermined error, a non-contact sensor that detects a position of an object around the construction machine, and a map information storage unit that extracts a detection result related to a vertical projection that protrudes vertically from a detection result of the non-contact sensor and stores the extracted detection result related to the vertical projection as map information when the determination unit determines that the error in the position detected by the position detection unit is equal to or smaller than the predetermined error. [A318]

"Vehicle control apparatus"

A vehicle control apparatus for implementing inter-vehicle distance control of a subject vehicle carrying the apparatus behind a preceding vehicle based on reflected waves from a target that is a reflecting portion of the preceding vehicle. In the apparatus, a controller is configured to implement the inter-vehicle distance control based on an inter-vehicle distance between a rear end of the preceding vehicle and the subject vehicle acquired from the detected distance. A control switcher is configured to, when target information for identifying the rear end of the preceding vehicle becomes unacquirable during implementation of the inter-vehicle distance control, suspend the inter-vehicle distance control and make a switch to the direct operation by the driver. [A319]

"Distribution and utilization of antenna information for location determination operations"

Disclosed are methods, devices, systems, apparatus, servers, computer-/processor-readable media, and other implementations, including a method, performed at a processor-based wireless mobile device, that includes receiving, by the mobile device, signals that include at least one message comprising antenna information for a first wireless node transmitting the signals, and transmitting, by the mobile device, an information message including the antenna information for the first wireless node to a remote device configured to receive and store antenna data for multiple wireless nodes obtained by one or more wireless devices while visiting respective areas covered by the multiple wireless nodes. [A320]

"System and method for detecting a particular occupancy status of multiple parking positions of a parking facility"

A system for detecting a particular occupancy status of multiple parking positions of a parking facility, which includes a parking occupancy sensor for detecting an occupancy status of a parking position, a displacement device for displacing the parking occupancy sensor along the parking positions, so that, due to a displacement of the parking occupancy sensor along the parking positions, the parking occupancy sensor is able to detect the particular occupancy status of the parking positions. A corresponding method, a corresponding parking facility for vehicles and a computer program are also described. [A321]

"System and method for accident avoidance during mobile device usage"

Generally, this disclosure provides systems, devices, methods and computer readable media for accident avoidance during mobile device usage. The mobile device may include a processor, a camera, one or more sensors, and accident avoidance circuitry. The accident avoidance circuitry may include user focus detection circuitry configured to detect that an application executing on the processor requires attention focus of a user of the mobile device, motion detection circuitry configured to determine motion of the mobile device based on input from the camera or from the one or more sensors, obstacle detection circuitry configured to detect obstacles in the path of the determined motion of the mobile device based on input from the camera, and warning generation circuitry configured to generate an alarm to the user based on the detected user attention focus, the determined motion and the detected obstacles. [A322]

"Matching system between convective cell in weather radar image and lightning and control method thereof"

The present invention discloses a matching system between a convective cell in a weather radar image and lightning, and a control method thereof. In other words, according to the invention, convective cells are detected in a weather radar image, lightning is detected through a total lightning detection system, and the detected lightning is matched with the detected convective cells in the weather radar image. Therefore, it is possible to rapidly and accurately match and confirm a lightning-generated convective cell of a plurality of convective cells. [A323]

"Systems, methods and devices for asset status determination"

A system for determining real time location of leaf node device, the system including at least one battery-powered Bluetooth Low Energy (BLE) enabled leaf node device, wherein the at least one leaf node device is associated with a corresponding monitored asset, and at least one beam forming reader node in communication, via BLE, with the at least one leaf node, the reader node creating a plurality of sectorized beams in a plurality of sectors and collecting data related to the at least one leaf node device from at least one of the plurality of sectors, wherein a location processing facility determines the real-time location of the at least one leaf node device based on the data collected by the beam forming reader node. [A324]

"Radar sensor including a radome"

A radar sensor for motor vehicles includes a printed circuit board which carries the mass and antenna structures of the radar sensor, and includes a housing accommodating the printed circuit board, the housing being formed on a transmit and receive side of the radar sensor by a radome which is transparent to radar radiation, characterized in that the radome has an essentially plane wall oriented obliquely to the printed circuit board. [A325]

"Structure disposed with peripheral information detection sensor, and self-driving vehicle"

A structure disposed with a peripheral information detection sensor includes: a peripheral information detection sensor that is disposed at a window frame portion of a side surface of a vehicle and that is equipped with a detection component that detects peripheral information relating to the area around the vehicle, a window member that is attached to the window frame portion and covers the peripheral information detection sensor from an exterior of the vehicle, with at least the section of the window member that opposes the peripheral information detection sensor being opaque or translucent, and an interior member that covers the peripheral information detection sensor from the vehicle interior side. [A326]

"Arrangement structure for peripheral information detection sensor and self-driving vehicle"

An arrangement structure for a peripheral information detection sensor includes the peripheral information detection sensor, a detection portion of which detects peripheral information of a vehicle, and an interior trim member. The peripheral information detection sensor is disposed at a vehicle cabin interior side of a windshield glass whose exterior surface is wiped by a wiper. The detection portion is disposed at a position opposing a wiping range of the wiper on the windshield glass. The interior trim member covers the peripheral information detection sensor from the vehicle cabin interior side thereof. [A327]

"Vehicle remote function system and method for effectuating vehicle operations based on vehicle FOB movement"

A vehicle remote function system is provided for use in effectuating vehicle operations based on movement of a fob relative to a vehicle. The system may include a controller for determining locations of the fob within zones proximate the vehicle based on ultra-wide band wireless signals transmitted between the antennas and the fob, the zones including a primary zone and secondary zones, each secondary zone at least partially within the primary zone. The controller may be configured to detect a movement of the fob between secondary zones and generate a control signal for use in effectuating a vehicle operation based on the movement detected. A method is also provided which may include transmitting ultra-wide band wireless signals between the fob and the antennas, detecting a movement of the fob between secondary zones, and generating a control signal for use in effectuating a vehicle operation based on the movement detected. [A328]

"System and method for detecting a user-dependent state of a sport object"

The invention relates to a system for detecting a user-dependent state of a sports object, comprising a detection device (101) for detecting a plurality of positions of the sports object, and a determination device (103) for determining the state of the sports object based on the plurality of positions detected. [A329]

"Method and system for generating a distance velocity azimuth display"

A method for determining a kinematic structure of a two-dimensional wind field and a system determining the same are provided. The method comprises receiving a plurality of Doppler velocities and a plurality of distances between a Doppler radar and a gate. Each Doppler velocity of the plurality of Doppler velocities corresponds to a respective distance of the plurality of distances between the Doppler radar and the gate. The method further comprises calculating a plurality of distance Doppler velocity values. The distance Doppler velocity values represent the plurality of measured Doppler velocities and the distance between the Doppler radar and the gate. The method further comprises estimating the kinematic structure of the 2D wind field using the plurality of distance Doppler wind velocity values. [A330]

"Subsurface imaging system and method for inspecting the condition of a structure"

In a method and system for inspecting the condition of a structure, the structure is scanned with a three-dimensional (3D) scanner. The 3D scanner includes a sensing system having one of a radar sensing device or an ultrasonic detection device. The sensing system detects 3D information about a subsurface of the structure, and the 3D scanner generates 3D data points based on the information detected by one or more of the radar sensing device and the ultrasonic detection device. A 3D model is constructed from the 3D data and is then analyzed to determine the condition of the subsurface of the structure. [A331]

"Method and system to identify and estimate relaxation frequencies for ground penetrating radars"

A system and associated methodology identifies and estimates relaxation frequencies, which are used by a Ground Penetrating Radar (GPR) . These estimated relaxation frequencies are used to characterize and interpret a reflected GPR signal from a ground. The system also identifies the number of relaxation frequencies and estimates their magnitudes and values. The system also exhibits high resistance to noise. [A332]

"Radar antenna assembly with panoramic detection"

A radar antenna assembly suitable to mount atop a vehicle as part of a radar system for the vehicle includes a horizontal array and a vertical array. The horizontal array is configured to preferentially detect objects in a forward area and a rearward area about the vehicle. The vertical array is configured to preferentially detect objects in a leftward area and a rightward area about the vehicle. The horizontal array and the vertical array cooperate to detect an object in a panoramic area that surrounds the vehicle. [A333]

"Sensor holder for a sensor for object detection"

A sensor holder for a sensor for object detection includes: an installation unit for the sensor, a holding frame on which the installation unit is pivotably held, and an adjustment shaft mounted on the holding frame, the adjustment shaft having a guidance contour which proceeds helically around the adjustment shaft and is in engagement with a guidance element of the installation unit. [A334]

"Collision avoidance assistance device for a vehicle"

A collision avoidance assistance device for a vehicle is provided. The collision avoidance assistance device includes a camera configured to acquire an image of an area around the vehicle and a controller. The controller is configured to: detect an image of an animal in the image of the area around the vehicle, determine a type of the animal detected in the image, retrieve behavior characteristics index values representing behavior characteristics of the determined type of the animal, calculate a future presence area of the animal based on the behavior characteristics index values, determine a probability of a collision between the animal and the vehicle based on the calculated future presence area of the animal, and perform a collision avoidance assistance function based on the determined probability of the collision between the animal and the vehicle. [A335]

"Resettable tranceiver bracket"

A resettable bracket is herein presented. The bracket is configured to mount a transceiver to a vehicle. The bracket includes a first piece and a second piece configured to be pivotably connected to each other. A docking station is mounted to the first piece. The docking station includes a bluff, an over-travel stop, and a plurality of arms configured to restrict pivotable movement of the second piece in relation to the first piece. A fitting element is mounted to the second piece. The fitting element is configured to dock into the docking station to substantially create the pivotable connection between the first and the second piece. A spring is installed at the pivotable connection between the first and second pieces. The spring is configured to allow the second piece to automatically return to a default position after being pivoted in relation to the first piece. [A336]

"Positioning with a radio-based locking system"

An access control device of a vehicle is configured to detect the spatial position of the access element of the vehicle safety unit relative to the vehicle via electromagnetically detecting the distances and angles between several low-frequency transmitting antennas of the vehicle safety unit and the low-frequency receiver of the access element. The access control device is also configured to detect the location position of an external induction charging unit relative to the vehicle via electromagnetically measuring the distance and angle between at least two transmitting antennas of several low-frequency transmitting antennas and at least one receiving antenna of the induction charging unit. [A337]

"Systems and methods for analyzing event data"

A computer-implemented method for determining a target situation in an athletic event. Positional information including the relative positions of a group of selected participants is initially received from a tracking system, and the aggregate motion of the selected participants is detected in real-time using the positional information. The target situation may be determined to have occurred when a change in the aggregate motion occurs in accordance with a predetermined characteristic during an initial time interval. [A338]

"Apparatus and method for providing shipment information"

An apparatus, including a shipment conveyance device which is a shipping container, pallet, or piece of luggage, a memory device located in, on, or at, the shipment conveyance device which stores information regarding the shipment conveyance device, a global positioning device which determines a position or location of the shipment conveyance device, a processing device which processes information regarding the shipment conveyance device in response to an occurrence of an event or a request for information and which generates a message containing information regarding the position or location of the shipment conveyance device and information regarding the occurrence of an event, a status of a shipment or transportation involving the shipment conveyance device, a temperature, or an impact or force on the shipment conveyance device, and a transmitter located in, on, or at, the shipment conveyance device which transmits the message to a communication device. [A339]

"Friend or foe identification system and method"

There are provided methods and systems for producing a wave-beam having substantially constant lateral extent over a desired range of distances, and interrogation and response system and methods utilizing the same. The method for producing a wave-beam having substantially constant lateral extent includes generating a plurality of at least partially incoherent constituent wave-beams having different divergences and directing the plurality constituent wave-beams to propagate along substantially parallel propagation axes such that the constituent wave-beams at least partially overlap and superpose to form a combined wave-beam. The divergences and intensities of the constituent wave-beams are selected such that the combined wave-beam has a desired substantially constant extent over a desired range of distances along said propagation axes. [A340]

"Motion detection device"

A motion detection device is provided. The motion detection device includes a first antenna, a voltage-controlled oscillator, a phase detector and a signal processing unit. The first antenna receives a first signal generated by a second signal reflected by a target object, so as to output the first signal to the phase detector or the voltage-controlled oscillator. The voltage-controlled oscillator receives first signal or the second signal and receives a frequency adjustment signal, so as to generate an oscillating signal according to the frequency adjustment signal and the one of the first signal and the second signal. The phase detector receives the oscillating signal and another one of the first signal and the second signal, and generates a first phase output signal and a second phase output signal. The signal processing unit estimates motion parameters of the target object according to the first and the second phase output signal. [A341]

"Antenna device and signal processing method"

An antenna device includes a plurality of antenna elements respectively configured to receive incident waves coming from an object, a modulating unit respectively configured to modulates a first received signal of the incident waves output from the antenna elements into a second received signal, the second received signals having a plurality of different frequencies and phases corresponding to polarization directions of the received incident waves, a synthesizing unit configured to synthesize the plurality of second received signals and generates a synthetic signal, a signal processing unit, configured to perform predetermined signal processing on the synthetic signal, and an extracting unit configured to extract third received signals for each frequency and each phase from the synthetic signal on which has been performed the predetermined signal processing. [A342]

"Methods and apparatus for controlling a surface scattering antenna array"

An array of scattering and/or reflector antennas are configured to produce a series of beam patterns, where in some embodiments the scattering antenna and/or the reflector antenna includes complementary metamaterial elements. In some embodiments circuitry may be configured to set a series of conditions corresponding to the array to produce the series of beam patterns, and to produce an image of an object that is illuminated by the series of beam patterns. [A343]

"Antenna system for ground penetrating radar"

Antenna system for a georadar, comprising two plate like antenna devices, where said two antenna devices comprise at least one sender antenna (1) and at least one receiver antenna (2) , respectively, as the antennas

(1,2) in each antenna device comprise monopoles formed by applying to metal surfaces an electrically insulating plate base (3) located on the underside of a layer of radar absorbing material (4) , where the top side of the material layer is covered by a metallic ground plane (5) . The antenna device is also arranged to lay against the ground (10) . A layer of radar absorbent material (4) is arranged on the top side of the ground planes (5) , and the ground planes (5) are not connected electrically to each other. [A344]

"Predictive sensor array configuration system for an autonomous vehicle"

An autonomous vehicle (AV) can include a predictive sensor configuration system that can dynamically detect reflectance anomalies that affect detectability by sensor array of the AV as the AV travels a current route. The predictive sensor configuration system can dynamically determine one or more configurations for the sensor array to attempt to positively identify the reflectance anomalies, and preemptively execute the one or more configurations for the sensor array as the AV travels the current route. [A345]

"Use of blink counts to locate movable tagged assets"

A method of locating a tagged movable asset comprises determining blink counts for receivers in a plurality of zones, and selecting one of the zones according to a comparison of the blink counts. [A346]

"System and method for estimating range to an RFID tag"

The a system for measuring distance between an RFID reader and tag, including an adaptive linear combiner, which is a tapped delay line with controllable weights on each tap, and outputs that are summed and subtracted from a reference to produce an error signal. After a sufficient number of cycles, the weight distribution indicates the delay of the received signal with respect to the reference, and by extension determines the distance between the tag and receiver. [A347]

"System and method for detecting movement of a mobile asset and controlling operations of the asset based on its movement"

A system and method are provided for detecting direction of movement. The system includes at least two radio frequency identification (RFID) readers arranged in different locations. The RFID readers transmit respective location signals from their locations and receive corresponding response signals from a portable electronic device (PED) when the PED is within range to receive the corresponding location signals, respectively. The system includes a controller configured to determine whether the individual response signals received by the RFID readers respectively satisfy a predetermined condition at a first time and a second time subsequent to the first time. The controller is also configured to determine a direction of movement of the portable electronic device relative to the locations of the RFID readers during the first and second times based on whether the response signals respectively satisfy the predetermined condition at the first and second times. [A348]

"Method of, and apparatus for, operating a vehicle"

A method of operating a vehicle wherein the method comprises using a distance sensor to determine the distance between a part of the vehicle and an object, and implementing a speed control procedure if the distance detected by the distance sensor falls below a predetermined value, characterized in that the method is implemented only while the vehicle is in reverse gear and for a period of time immediately following disengagement of the reverse gear. [A349]

"Blind spot warning apparatus, assembly and method"

A blind spot warning apparatus, system and method provide for an electrically-actuated blind spot detection sensor that is electronically or wirelessly connected to a programmable logic controller ("PLC") . The PLC is then electronically or wirelessly connected to at least one electrically-actuated light-emitting fixture that can be affixed to the exterior surface of a first vehicle. The light fixture is positioned to be easily visualized by the driver of a second vehicle. Visualization is accomplished by using letters, words, symbols or other warning indicia within the fixture to convey a visual warning to the driver of the second vehicle. Light fixture actuation is controlled by the PLC as to both the position of the second vehicle relative to the first vehicle and to the amount of time that the second vehicle remains in a particular blind spot position as detected by the detection sensor and processed via the PLC. [A350]

"Method for monitoring the level of an ethylene polymerization catalyst slurry"

An apparatus may include a mud pot and a reflectometer to monitor a level of an interface between liquid diluent and catalyst slurry in the mud pot using reflectometry. The apparatus may include a mixing tank and a conduit to transfer catalyst slurry from the mud pot to the mixing tank. The apparatus may include a polymerization reactor and a conduit to provide catalyst slurry from the mixing tank to the polymerization reactor. [A351]

"Vehicle positioning guide lights"

A system that assists a driver with properly positioning a vehicle. Such systems may include an interface to information from vehicle sensor (s) , light strip (s) , and computing device (s) including one or more tangible computing elements. The computing device (s) may perform steps that include determining a position of the vehicle using the information from the vehicle sensor (s) , and generating optical indication (s) using the light strip (s) of an action that the driver should take based on the position. In some aspects, the system is deployed in a carwash bay and assists the driver with properly positioning the vehicle in the carwash bay. The optical indication may be green light to indicate that the vehicle should be moved forward, blue light to indicate that the vehicle should be moved backward, and red light to indicate that the vehicle should be stopped. Also, associated methods. [A352]

"Vehicle identification system and vehicle identification device"

A vehicle identification system includes a communication device receiving other vehicle information related to other vehicle around a host vehicle, a detection device detecting other vehicle around the host vehicle, and a vehicle identification device identifying a vehicle transmitting the other vehicle information on the basis of the other vehicle information received by the communication device and the detection device, wherein the vehicle identification device is switching between a capturing mode capturing the transmitting vehicle on the basis of the other vehicle information received by the communication device and the detection device, and a tracking mode identifying the transmitting vehicle on the basis of a positional relation between the host vehicle and the transmitting vehicle at the time of the capturing mode, and motion information related to the transmitting vehicle based on the other vehicle information received by the communication device, after the capturing mode. [A353]

"System and method for correcting position information of surrounding vehicle"

The present invention relates to a system and a method for correcting position information of a surrounding vehicle, which provide accurate position information of a surrounding vehicle by correcting the position information of the surrounding vehicle received through vehicle-to-vehicle communication, and identifies a license-plate number of a front vehicle through a sensor mounted in a vehicle, calculates a position of the front vehicle, and compare position information, which is included in information including the identified number of the front vehicle in information received from the surrounding vehicle, with the calculated position of the front vehicle to correct the position information of the surrounding vehicle. [A354]

"Radar ambiguity resolving detector"

Various exemplary embodiments relate to a method for determining the velocity of an object using radar system having a processor, including: receiving, by a processor, a first digital signal corresponding to a first transmit signal, receiving, by the processor, a second digital signal corresponding to a second transmit signal, processing the first digital signal to produce a first range/relative velocity matrix, detecting objects in the first range/relative velocity matrix to produce a first detection vector, unfolding the first detection vector, processing the second digital signal to produce a second range/relative velocity matrix, interpolating the second range/relative velocity matrix in the relative velocity direction wherein the interpolated second range/relative velocity matrix has a frequency spacing corresponding to the frequency spacing of the first range/relative range velocity matrix in the relative velocity direction, detecting objects in the second range/relative velocity matrix to produce a second detection vector, unfolding the second detection vector, and determining a true velocity of the detected objects based upon the unfolded first and second detection vectors. [A355]

"Clutter suppressing device and radar apparatus provided with the same"

A clutter suppressing device for suppressing echo data of static clutter components indicating reflection waves caused by radar transmission signals reflecting on a static object is provided. The device includes a static clutter component suppressor configured to receive reception signals containing the static clutter components, and suppress the static clutter components, a reference data memory configured to store, as reference data, echo data of the reception signals obtained in fine weather and in which the static clutter components are suppressed by the static clutter component suppressor, and a rain component extracting module configured to extract echo data indicating rain components contained in the reception signals, by removing the reference data stored in the reference data memory from echo data of the reception signals obtained in rainy weather and in which the static clutter components are suppressed by the static clutter component suppressor. [A356]

"Systems and methods for adaptive sensor angle positioning in vehicles"

A system and method are provided and include a subject vehicle having a sensor that senses information about an environment of the subject vehicle. An actuator rotates the sensor according to a commanded angle. A controller determines a position and a trajectory path of the subject vehicle, determines an adaptive point along the determined trajectory path based on the position, and generates the commanded angle for the actuator to rotate the sensor towards the adaptive point. [A357]

"Vehicle radar diagnostic arrangement"

A vehicle radar system (3, 3', 3'') and method which including a microcontroller unit (21) , MCU, and a plurality of Analog to Digital Converters (9, 10, 11, 12) , (ADCs) , arranged to convert the received signals to a digital form and to transfer the converted digital signals to a first and second Digital Signal Processor (DSP) (18, 19) , DSP. The

MCU (21) is arranged to control the DSPs (18, 19) such that for one time frame (n) , the first DSP (18) functions as a Master DSP and the second DSP (19) functions as a Slave DSP, and such that for the next time frame (n+1) , the first DSP (18) is configured to function as a Slave DSP and the second DSP (19) functions as a Master DSP. The MCU compares the raw target data from the first and second DSPs (19) to determine a degree of functionality for the DSPs (18, 19) . [A358]

"Vehicular control system using cameras and radar sensor"

A vehicular control system includes a plurality of cameras that capture image data, at least one radar sensor that senses radar data and a control that processes image data captured by the cameras and sensed radar data. The control, responsive to processing of captured image data, detects lane markers and/or road edges and determines curvature of the road being traveled by the equipped vehicle. The control processes captured image data and sensed radar data to detect vehicles. The control, based on processing of captured image data and/or sensed radar data, detects another vehicle and determines distance from the equipped vehicle to the detected other vehicle. The control may, based at least in part on the detection of another vehicle and the determination of distance from the equipped vehicle to the detected other vehicle, determine whether it is safe for the equipped vehicle to execute a lane change maneuver. [A359]

"Method and system for detecting, tracking and estimating stationary roadside objects"

A system and method for selectively reducing or filtering data provided by one or more vehicle mounted sensors before using that data to detect, track and/or estimate a stationary object located along the side of a road, such as a guardrail or barrier. According to one example, the method reduces the amount of data by consolidating, classifying and pre-sorting data points from several forward looking radar sensors before using those data points to determine if a stationary roadside object is present. If the method determines that a stationary roadside object is present, then the reduced or filtered data points can be applied to a data fitting algorithm in order to estimate the size, shape and/or other parameters of the object. In one example, the output of the present method is provided to automated or autonomous driving systems. [A360]

"Driving assist system for vehicle"

A vehicular driving assist system includes a data processor module that receives and processes image data provided by a plurality of video sensors and sensor data provided by a plurality of non-video sensors. The video sensors include at least five cameras disposed at respective locations of the vehicle and having respective fields of view exterior the vehicle. The data processor module communicates with other vehicle systems via a vehicle bus of the vehicle. Received image data and received sensor data are processed at the data processor module for at least one of (i) object tracking of objects present exterior of the vehicle, (ii) object identification of objects present exterior of the vehicle and (iii) object classification of objects present exterior of the vehicle. Responsive at least in part to processing of image data and sensor data at the data processor module, a driving assistance system of the vehicle is controlled. [A361]

"System and method for providing a distributed directional aperture"

A distributed directional aperture (DDA) system provides the capability to receive and/or transmit signals, limiting that reception or transmission to a 3-dimensional beam. The DDA system includes sensing and/or emitting array subsystems which comprise sensors and/or emitters distributed across, within, or under the skin of an aircraft, ship, ground vehicle, or fixed installation. The sensors receive energy, convert the received signals to digital information, and transmit that information via a telemetry subsystem to a beamformer subsystem. The beamformer subsystem analyzes the received signals from the sensors and/or emitters in order to determine the signal content from a specific direction. The emitters transmit energy, converting signals received from the beamformer subsystem via the telemetry subsystem into energy emissions. Methods of providing the DDA system including subsystems thereof are also disclosed. [A362]

"Sleeve with electronic extensions for a cell phone"

A passively re-radiating cell phone sleeve assembly capable of receiving a nested cell phone provides signal boosting capabilities. Signal boosting is enabled by use of an additional antenna, a pass-through repeater, dual antenna isolation capability and other features. [A363]

"Radar target detection system for autonomous vehicles with ultra-low phase noise frequency synthesizer"

An object detection system for autonomous vehicle, comprising a radar unit and at least one ultra-low phase noise frequency synthesizer, is provided. The radar unit configured for detecting the presence and characteristics of one or more objects in various directions. The radar unit may include a transmitter for transmitting at least one radio signal, and a receiver for receiving the at least one radio signal returned from the one or more objects. The ultra-low phase noise frequency synthesizer may utilize Clocking device, Sampling Reference PLL, at least one fixed frequency divider, DDS and main PLL to reduce phase noise from the returned radio signal. This proposed system overcomes deficiencies of current generation state of the art Radar Systems by providing much lower level of phase noise which would result in improved performance of the radar system in terms of target detection, characterization etc. Further, a method for autonomous vehicle is also disclosed. [A364]

"Systems and method for AIS transponder integration with ILS/VOR receivers"

A receiver includes an RF module to receive and down convert multiple types of RF signals received from at least one antenna, a communication unit configured to communicate signals with at least one external device, and a processing unit communicatively coupling the radio frequency module with the communication unit. Processing unit receives operation mode selection. When first operation mode is selected, processing unit receives first input signal from antenna via RF module (the first input signal including ILS signal and/or VOR signal) and outputs first output signal based on first input signal to external device. When second operational mode is selected, processing unit receives second input signal from antenna via radio frequency unit (second input signal including AIS signal including data regarding a current location of remotely located transmitting device) and outputs second output signal based on second input signal to external device. [A365]

"System and method for transmitting detected object attributes over a dedicated short range communication system"

A motor vehicle system for generating and transmitting detected object attributes includes a communication system module positioned in a host vehicle receiving vehicle attribute data from a target vehicle and a sensed vehicle and preparing a fused object attribute data for transmission to the target vehicle. A vehicle track data sub-module in communication with the communication system module independently tracks the sensed vehicle and the target vehicle. An object detection and classification system module having a 3D object detection module identifies a vehicle type defined at least by a vehicle size and generates an object attribute data. A target fusion module receives the object attribute data from the object detection and classification system module, fuses the object attribute data with the vehicle attribute data to create the fused object attribute data, and forwards the fused object attribute data to the communication system module for transmission. [A366]

"Method for representing a vehicle environment with position points"

A sensor system detects objects in an environment ahead of a vehicle. The environment is represented by a predetermined fixed number of position points in an environment model. Initially and when no objects are detected, the position points may be distributed stochastically over the detection area of the sensor system. When objects are detected, the position points are re-distributed based on the detected objects, e.g. with a higher density of position points to represent the detected objects. Because the total number of position points is a predefined fixed number that remains constant, the processing, storage and transmission of the environment model involves a constant data volume and efficient use of memory and transmission bandwidth. [A367]

"Real-time traffic monitoring systems and methods"

Various embodiments of the invention provide methods, systems, and computer program products for monitoring a landscape surrounding an object such as a vehicle and signaling neighboring objects, such as other vehicles or pedestrians, as to whether it is safe or not to move around the object. Specifically, a portion of landscape surrounding an object is monitored using a network of object recognition devices that are capable of recognizing objects against the portion of landscape. A first object is detected by one of the devices and a determination is made as to whether the first object is at a distance to allow a second object to move safely around the object and avoid the first object. Upon determining the first object is not at such a distance, a message is displayed that can be viewed by the second object conveying to the second object not to move around the object. [A368]

"Method for requesting transportation services"

A method for safely and efficiently requesting transportation services through the use of mobile communications devices capable of geographic location is described. Individual and package transportation may be provided. New customers may be efficiently serviced, and the requester and transportation provider locations may be viewed in real time on the mobile devices. [A369]

"Side lobe modulation system and related techniques"

Embodiments for providing side lobe modulation in a radio frequency (RF) transmitting are generally described herein. In some embodiments, an antenna side lobe is modulated to add data to the side lobe for communication with an intended recipient. [A370]

"Method and apparatus for bistatic laser range imaging"

The present invention is directed to an apparatus and method for bistatic laser range imaging. The apparatus utilizes two light sources, two receivers, a demodulator and an image processor such that a three dimensional image is produced. The method includes generating beams of intensity modulated light, one toward a target, another toward a receiver. The light toward the target reflects from the target toward another receiver. The modulation envelopes of the beams of light are demodulated into components, the components digitized, then decimated, and a three dimensional image is constructed from the digitized components. [A371]

"Apparatus and method for controlling alignment of vehicle radar"

The present invention relates to an apparatus and a method for controlling an alignment of a vehicle radar capable of automatically detecting a vertical angle of a target to perform an alignment in a vertical direction. The apparatus includes: a substrate, a transmitting antenna unit configured to be disposed at one side of the substrate, a receiving antenna unit configured to be disposed at the other side of the substrate, and a vertical angle detection unit configured to detect a vertical angle of a target based on a signal received from the receiving antenna unit, wherein the receiving antenna unit includes: a plurality of first antennas configured to be arranged in a row direction to a surface of the substrate, and a plurality of second antennas configured to be arranged in a column direction to the surface of the substrate. [A372]

"Vertical alignment device and method for vehicle radar"

Provided are a vertical alignment apparatus and method for a vehicle radar. The vertical alignment apparatus includes a case at which a shaft is formed, an antenna that is coupled with the shaft and is disposed to be rotatable about the shaft in a vertical direction, an antenna rotary member that rotates the antenna, and a stopper that limits an angle of rotation of the antenna. [A373]

"Weather radar system"

Weather radar system which uses antennas constituted by the elongated aperture of waveguides, and form at least an array (510, 520) mounted on a rotating horizontal (502) , and the said apertures are as wide as one wavelength (.lamda.) and length higher than 20.lamda., wherein the small aperture in azimuth ranges from 0.5.degree. to 2.degree. and is synthesized by high rotational speeds together with signal processing techniques such as ROSAR. [A374]

"Angle of arrival (AOA) positioning method and system for positional finding and tracking objects using reduced attenuation RF technology"

Systems and methods for determining user equipment (UE) locations within a wireless network using reference signals of the wireless network are described. The disclosed systems and methods utilize a plurality of in-phase and quadrature (I/Q) samples generated from signals provided by receive channels associated with two or more antennas of the wireless system. Based on received reference signal parameters the reference signal within the signals from each receive channel among the receive channels is identified. Based on the identified reference signal from each receive channel, an angle of arrival between a baseline of the two or more antennas and incident energy from the UE to the two or more antennas is determined. That angle of arrival is then used to calculate the location of the UE. The angle of arrival may be a horizontal angle of arrival and/or a vertical angle of arrival. [A375]

"Combination of radar sensor and trim component for a motor vehicle"

A combination of a radar sensor and a trim component, which are to be mounted on a motor vehicle so that the trim component is penetrated by microwaves of the radar sensor, the trim component including at least one layer, which reflects a portion of the microwaves, the trim component including an additional layer, which is configured based on thickness and dielectric constant to reduce the reflection. [A376]

"Vehicle radar system with image reflection detection"

A radar system suitable for use on a vehicle and configured to detect a false radar-track arising from a reflection of a radar return from a target includes a first sensor, a second sensor, and a controller. The first sensor outputs a first signal indicative of a first target in a first area proximate to a vehicle. The second sensor outputs a second signal indicative of a second target in a second area proximate to the vehicle and different from the first area. The controller receives the first signal and the second signal. The controller determines that the second target is a reflection of the first target when a reflection-line that bisects and extends orthogonally from a line-segment extending between the first target and the second target intersects with a reflection surface detected by the second sensor. [A377]

"Data processing method and apparatus based on automatic identification system"

The present invention discloses a data processing method and apparatus based on an automatic identification system, relates to the field of communications network technologies The method comprises: a virtual station container receives data request sent by a poller, and successively checks whether each virtual station in the virtual station container has to-be-sent data in a current timeslot, where the virtual station includes a virtual timeslot allocation logic TAL device, and when a first virtual station has to-be-sent data in the current timeslot, the virtual station container reads the data in the first virtual station, and sends the read data to a transmitter. The method provided by the embodiments of the present invention is applicable to data exchange between an automatic identification system and an external network. [A378]

"Angle-resolving radar sensor"

An angle-resolving radar sensor, e.g., for motor vehicles, includes, an antenna having multiple antenna elements which are each switchable to one of multiple evaluation channels, and an evaluation device for determining the angle of incidence of a received signal based on the amplitudes measured in the evaluation channels. The number of antenna elements is greater than the number of evaluation channels and a switching device is provided to connect the evaluation channels alternatingly to different selections of antenna elements. [A379]

"Driver assist system for vehicle"

A driver assist system for a vehicle includes at least one non-visual sensor and a forward-viewing camera disposed that is part of a multi-camera vision system of the vehicle that includes at least two side cameras and a rear backup camera. A video display screen is viewable by a driver of the vehicle when the driver is normally operating the vehicle. During a driving or parking maneuver of the vehicle, images derived, at least in part, from image data captured by at least some of the cameras are displayed by the video display screen, and at least one indication is provided to the driver of the vehicle during the driving maneuver. A unitary image is synthesized from image data captured by the multi-camera vision system and approximates a view as would be seen by a virtual camera at a single location exterior of the vehicle. [A380]

"Loss profile analysis"

Apparatuses and methods are disclosed for applying radio frequency (RF) energy to an object in an energy application zone. At least one processor may be configured to cause RF energy to be applied at a plurality of electromagnetic field patterns to the object in the energy application zone. The processor may be further configured to determine an amount of power dissipated in the energy application zone, for each of the plurality of field patterns. The processor may also be configured to determine a spatial distribution of energy absorption characteristics across at least a portion of the energy application zone based on the amounts of power dissipated when the plurality of field patterns are applied to the energy application zone. [A381]

"Successive signal interference mitigation"

A radar sensing system for a vehicle includes a transmitter, a receiver, and an interference mitigation processor. The transmitter transmits radio signals. The receiver receives radio signals. The received radio signals include reflected radio signals that are each transmitted radio signals reflected from objects in the environment. The receiver also down-converts and digitizes the received radio signals to produce a baseband sampled stream. The interference mitigation processor produces a second received radio signal that includes reflected radio signals that are transmitted radio signals reflected from a first object. The interference mitigation processor uses the second received radio signal to remove selected samples from the baseband sampled stream that are attributed to radio signals reflected from the first object to produce a modified baseband sampled stream. The receiver uses the modified baseband sampled stream to detect a second object more distant than the first object. [A382]

"System and method for mobile data expansion"

A data expansion system that provides continuum of discrete wireless small cell coverage areas for mobile terminals includes a set of roadway reflectors configured to provide wireless broadband data services to a mobile terminal. Each reflector includes processing circuitry configured to establish communications between the mobile terminal and a backhaul network. Each reflector includes a wireless transceiver configured to transmit and receive data. Each reflector includes a power source that converts solar energy into electricity. Each reflector includes a housing configured to contain the processing circuitry, the transceiver, and the power source. The housing has a raised reflective surface. [A383]

"System and method for detecting obstacles"

The present invention provides an obstacle detecting system and method. The obstacle detecting system includes: a transmitting unit which emits a laser signal, a MEMS scanning mirror which scans detecting regions set at an angle of view at which obstacles in front of a vehicle are detected and a cut-in situation when a vehicle in a next lane suddenly cuts in is detected, and divides the detecting regions into a plurality of regions to scan the plurality of regions at different point intervals, a receiving unit which receives the laser signal transmitted from the MEMS scanning mirror to detect information on an object detected in the detecting regions, and a processing unit which detects the obstacles and the cut-in situation through the information detected in the receiving unit to issue an alarm or transmit a braking command. [A384]

"Inferring state of traffic signal and other aspects of a vehicle's environment based on surrogate data"

A vehicle configured to operate in an autonomous mode can obtain sensor data from one or more sensors observing one or more aspects of an environment of the vehicle. At least one aspect of the environment of the vehicle that is not observed by the one or more sensors could be inferred based on the sensor data. The vehicle could be controlled in the autonomous mode based on the at least one inferred aspect of the environment of the vehicle. [A385]

"Use of detected objects for image processing"

Methods and systems for the use of detected objects for image processing are described. A computing device autonomously controlling a vehicle may receive images of the environment surrounding the vehicle from an image-capture device coupled to the vehicle. In order to process the images, the computing device may receive information indicating characteristics of objects in the images from one or more sources coupled to the vehicle. Examples of sources may include RADAR, LIDAR, a map, sensors, a global positioning system (GPS) , or other cameras. The computing device may use the information indicating characteristics of the objects to process received images, including determining the approximate locations of objects within the images. Further, while processing the image, the computing device may use information from sources to determine portions of the image to focus upon that may allow the computing device to determine a control strategy based on portions of the image. [A386]

"Vehicle radar installation structure and fascia retainer"

An automotive radar installation structure that allows a radar main body to be assembled to a vehicle in a simple arrangement and with stable performance, and a fascia retainer to attach a bumper fascia as an exterior part of a bumper to the vehicle. The structure includes a flat solid shape radar main body 122 and a transmission and/or reception surface to transmit/receive radio waves, and a fascia retainer 120 to attach a bumper fascia 108 of a rear bumper 104 of the vehicle to the vehicle main body. The fascia retainer 120 has a fixation portion 150, and a radar installation portion 128 in the vicinity of the fixation portion 150 having a recessed shape to receive the radar main body 122 so that the transmission and/or reception surface 130 faces outward of the vehicle. [A387]

"RF proximity sensor"

A sensor has a strip resonator filter that energizes an emitter patch which emits an electric field out from the strip resonator filter (away from the strip resonator filter) . The capacitance of the filter, or specifically the coupling capacitance and radiation pattern of the slotted patch, is altered when an object such as a finger is near the sensor. Resulting changes in a signal outputted by the filter can be used to determine how close the object is to the sensor. The strip resonator filter may be a half wavelength strip resonator coupled filter having three separate strips. The patch may have a slot and two accompanying strips. An arrangement of multiple sensors may detect the position of an object in two or three dimensions. [A388]

"Surface non-uniformity determination with radio waves"

Various embodiments that pertain to surface non-uniformity detection through use of radio waves are described. A vehicle can transmit radio waves to an area the vehicle is traveling to, such as a road in front of an automobile. The automobile can receive and process returned radio waves to determine if the road has a non-uniformity, such as a significant pothole or speed bump. If the road has the non-uniformity, then a driver of the automobile can be alerted so the driver can decide if evasive action should be taken and take such action if appropriate. [A389]

"Vehicle sensing systems including retractable mounting structures"

A vehicular sensing system, a vehicle and a method of performing one or both of vehicular mapping and navigating operations using the sensing system. The sensing system includes one or more sensors, a retractable mounting structure secured to a roof of the vehicle to be selectively placed within a recess formed in the roof. The mounting structure and sensor cooperative with one another such that the mounting structure selectively moves the sensor between a stowed position and a deployed position. A fairing is used to cover at least a portion of the sensing system and the recess when the sensing system is stowed within the recess. In a deployed position, the sensor is extended away from the roof to permit the sensor to acquire mapping or navigation data, while in its stowed position, the sensor, mounting structure and fairing define aesthetically-pleasing and aerodynamically unobtrusive profile across the portion of the roof that corresponds to the recess. [A390]

"Vehicle headlight"

The invention relates to a vehicle headlight, comprising a housing (1) and modulatable light or IR radiation sources (4) which are arranged within the housing (1) and on a movable module support (5) , and comprising an interface (2) for connection to an external vehicle processor (3) , wherein an image sensor (6) for determining depth information from the backscatter radiation of the light or IR radiation sources (4) is arranged within the housing (1) , and a processor (8) connected to the image sensor (6) , which processor is connected via a modulator (9) to at least some of the modulatable light or IR radiation sources (4) arranged within the housing (1) . It is proposed in accordance with the invention that the processor (8) is connected via a bidirectional data link (10) to the interface (2) , and the image sensor (6) is arranged on the module support (5) or on an image sensor support triggered jointly with the module support (5) . An application of ToF technology in automotive engineering which is fit for day-to-day use and suitable for series production is achieved in this manner by the best possible integration in conventional automotive engineering. [A391]

"Interior display systems and methods"

System and method for using an interior display device in a vehicle. The interior display device includes a projection device and a controller. The controller is configured to receive a plurality of vehicle parameters and determine an expected location within an interior of the vehicle based on the plurality of vehicle parameters. The expected location corresponds to an interior area of the vehicle where a driver would be expected to look. The controller is further configured to select an image (515, 520) based on the plurality of vehicles parameters and operate the projection device to project the image at the expected location within the interior of the vehicle. [A392]

"Adaptive communication for mobile router systems"

An approach to adaptively positioning a set of mobile routers to provide communication services to a set of clients makes use of estimated direction profiles of communication between routers and clients. The approach does not rely on a Euclidean model in which communication characteristics (e.g., signal strength, data rate, etc.) depend on distance between communicating nodes, and does not necessarily require sampling of communication characteristics in unproductive directions in order to move the routers to preferable locations. [A393]

"Communication device and method in the cellular band"

A wireless communication method in a network comprising one or several beacons and a plurality of end-points, comprising: sending by a beacon a timing message modulated according to a chirp spread spectrum format, receiving said timing message in one or several end-nodes a receiver, detecting said timing message aligning a local frequency reference and/or time reference of the end-node to the time reference of the transmitter by means of said timing message. [A394]

"On-vehicle radar device and vehicle"

An on-vehicle radar device includes a mount and an antenna configured to transmit a transmission wave from an inner side of laminated glass, which includes an innermost glass layer, an outermost glass layer, and an intermediate resin layer, and receive a reflected wave. The antenna includes a transmitting antenna. When the mount is mounted on a bracket, the incident angle of the transmission wave on the innermost glass layer is greater than a Brewster angle on the inner surface of the innermost glass layer, and the incident angle of the transmission wave on the outermost glass layer is less than or equal to a Brewster angle between the outermost glass layer and the intermediate resin layer. [A395]

"Object detection apparatus"

An object detection apparatus mounted in a vehicle, includes a first domain definition unit, a second domain definition unit, and a determination unit. The first domain definition unit defines a first object domain including a first detection point which is indicative of a position of a first object detected by using a vehicle-mounted radar. The second domain definition unit defines a second object domain including a second detection point which is indicative of a position of a second object detected on the basis of an image captured by a vehicle-mounted monocular camera. The determination unit determines whether or not an overlapping domain of the first and second object domains is present, and when it is determined that an overlapping domain of the first and second object domains is present, then determines that the first and second objects are the same. [A396]

"Object recognition apparatus"

A sameness judgment unit of an object recognition apparatus sets a threshold value for a relative distance between the first object and the second object, for judging whether or not the first object and the second object are the same. If at least a portion of the first object exists on a travel path of a vehicle, and the second object exists outside of the travel path, the sameness judgment unit judges that the first object and the second object are different objects, even if the relative distance is less than or equal to the threshold value. [A397]

"Associative object tracking systems and methods"

Systems and methods track a first object when continuous tracking information for the first object is not available. The systems and methods detect when the tracking information for the first object is not available. A last time of a last determined location of the first object is determined and a second object closest to the last determined location at the last time is determined. The location of the first object is associated with a location of the second object if tracking information for the first object is not available. [A398]

"Adaptive filtering for FMCW interference mitigation in PMCW radar systems"

A radar sensing system for a vehicle includes a transmitter configured for installation and use on a vehicle and able to transmit radio signals. The radar sensing system also includes a receiver and a processor. The receiver is configured for installation and use on the vehicle and able to receive radio signals. The received radio signals include transmitted radio signals that are reflected from objects in the environment. The received radio signals further include radio signals transmitted by at least one other radar system. The processor samples the received radio signals to produce a sampled stream. The processor is configured to control an adaptive filter. Responsive to the processor, the adaptive filter is configured to filter the sampled stream, such that the radio signals transmitted by the at least one other radar system are removed from the received radio signals. [A399]

"Vehicular radar system with self-interference cancellation"

A digital FMCW radar is described that simultaneously transmits and receives digitally frequency modulated signals using multiple transmitters and multiple receivers and associated antennas. Several sources of nearby spillover from transmitters to receivers that would otherwise degrade receiver performance are subtracted by a cancellation system in the analog radio frequency domain that adaptively synthesizes an analog subtraction signal based on residual spillover measured by a correlator operating in the receivers' digital signal processing domains and based on knowledge of the transmitted waveforms. The first adaptive cancellation system achieves a sufficient reduction of transmit-receive spillover to avoid receiver saturation or other non-linear effects, but is then added back in to the signal path in the digital domain after analog-to-digital conversion so that spillover cancellation can also operate in the digital signal processing domain to remove deleterious spillover components. [A400]

"Vehicular lighting apparatus"

A vehicular lighting apparatus is provided with: a detector configured to detect a movable body around a self-vehicle, a deteminator configured to determine whether or not the movable body is an object whose attention is to be called, and a projector configured to project predetermined visual information by using illumination light in a predetermined range around the object if it is determined by the determinator that the movable body is the object. The predetermined visual information includes first information to be presented to a driver of the self-vehicle and second information to be presented to the object. The predetermined visual information is visualized as the first information by the driver of the self-vehicle and is visualized as the second information by the object, depending on a viewpoint difference between the driver of the self-vehicle and the object. [A401]

"Automotive lighting device and a vehicle having the same"

An automotive lighting device includes a housing and at least one optical sensor disposed in the housing. The at least one optical sensor is configured to emit an optical signal and generating a data signal in response to a received reflected optical signal. [A402]

"Pre-warning method and vehicle radar system"

A pre-warning method utilized in a vehicle radar system is disclosed. The vehicle radar system includes a frequency-modulation continuous wave (FMCW) module, a data transceiver module and an antenna module, and the FMCW module and the data transceiver module share the antenna module. The pre-warning method includes the FMCW module utilizing the antenna to transmit and receive beat signals to detect dynamic information of a target corresponding to the vehicle radar system and obtain a first detection result, and receiving and broadcasting data to broadcast the first detection result via the data transceiver module and the antenna module, or receive a detection result broadcasted by another vehicle radar system and combine the detection result with the first detection result to perform real-time target tracking and alarm. [A403]

"Wheel detection and its application in object tracking and sensor registration"

A method and system are disclosed for tracking a remote vehicle which is driving in a lateral position relative to a host vehicle. Target data from two radar sensors are provided to an object detection fusion system. Wheels on the remote vehicle are identified as clusters of radar points with essentially the same location but substantially varying Doppler range rate values. If both wheels on the near side of the remote vehicle can be identified, a fusion calculation is performed using the wheel locations measured by both radar sensors, yielding an accurate estimate of the position, orientation and velocity of the remote vehicle. The position, orientation and velocity of the remote vehicle are used to trigger warnings or evasive maneuvers in a Lateral Collision Prevention (LCP) system. Radar sensor alignment can also be calibrated with an additional fusion calculation based on the same wheel measurement data. [A404]

"Systems and methods of location and tracking"

A system for computing accurate position location coordinates of tags used for tracking assets and people include a first network of access points to help compute a first approximation of the tag position location, a second network of access points underlying the first network for fine position location determination, and a position location server for controlling the second network of access points and computing position location based on round trip delay measurements between tags and the access points. [A405]

"Method for the rapid interrogation of a passive sensor, in particular of the surface acoustic waves type, and system for measuring the unique frequency of such a sensor"

For passive sensor with resonator having a natural frequency, a method comprises: a first phase emission of an electromagnetic signal toward the passive sensor at an emission frequency, the resonator oscillating in a forced regime at the emission frequency and then oscillating at its natural frequency when the emission is cut off, a first phase reception of the damped signal oscillating at natural frequency emitted by passive sensor, a measurement of the frequency being performed, a second phase emission of an electromagnetic signal at the measured frequency toward the passive sensor, the resonator oscillating in a forced regime at the measured frequency and then oscillating at its natural frequency when the emission is cut off, a second phase reception of the damped signal oscillating at natural frequency, a measurement of the frequency being performed, determination of the natural frequency being stopped due to measurement performed in this second reception phase. [A406]

"Method and device for an overtaking assistant"

A method for an overtaking assistant for a vehicle is provided. The vehicle is equipped with environment sensing systems for detecting objects in the own and an adjacent lane on the sides and at the rear of the vehicle. The space in front of the vehicle is preferably detected by environmental sensors as well. Autonomous cutting into an adjacent lane is only initiated if a first vehicle is detected in the adjacent lane. The first vehicle is taken as a reference for a speed of vehicles in the passing lane. It is also assumed that a second vehicle that approaches the first vehicle fast in the same lane has detected the first vehicle and will adjust its speed to the speed of the first vehicle. [A407]

"Vehicle control apparatus for implementing inter-vehicle distance control using offset associated with target on preceding vehicle"

A vehicle control apparatus for implementing inter-vehicle distance control of a vehicle carrying the apparatus behind a preceding vehicle. In the apparatus, an offset storage is configured to calculate an offset that is a difference between detected distances to first and second targets, and store the offset associated with the first target forward of the second target. The inter-vehicle distance control may be implemented based on a distance calculated by subtracting the offset from the detected distance to the first target. An offset updater is configured to determine whether or not a relative distance between the first and second targets has increased or decreased, and when the relative distance between the first and second targets has increased or decreased, update the offset stored by the offset storage. [A408]

"Pulse doppler radar range and velocity measurements"

Systems and methods are disclosed to determine an unambiguous radial velocity for weather phenomena using weather radar that is not limited by the Doppler Dilemma. Some embodiments include transmitting a complex waveform and using the returned electromagnetic signal to determine the unambiguous radial velocity. [A409]

"Autonomous emergency braking system and method for recognizing pedestrian therein"

An autonomous emergency braking system for performing emergency braking when a potential collision object is recognized during traveling of a vehicle, comprises a camera, a radar sensor and an electronic control unit. The camera is installed in the vehicle to acquire an image signal of a proximity of the vehicle. The radar sensor is configured to detect an object located in a preset detection region from the vehicle. The electronic control unit is configured to, when a counterpart vehicle is located adjacent to a pedestrian, generate a pedestrian detection signal that is not included in a detection signal acquired by the radar sensor, and recognize the pedestrian by fusing the generated pedestrian detection signal and a pedestrian detection signal detected by the camera. [A410]

"Object recognition apparatus"

In an object recognition apparatus mounted on a vehicle, comprising: a plurality of recognizers each adapted to conduct object recognition ahead of the vehicle at intervals, and an object continuity determiner adapted to conduct object continuity determination based on a result of the object recognition conducted by the recognizers, the object continuity determiner determines that, when a first object recognized by any of the object recognizers at time (N) is present at a position within a predetermined area defined by a position of a second object recognized by other of the object recognizers at time (N-1) earlier than the time (N) , the first object and the second object are identical to each other to be one object which is kept recognized continuously for a time period ranging from at least the time (N-1) to the time (N) . [A411]

"Classification and identification of solid propellant rocket motors"

Pressure variations within a solid propellant rocket motor produce like variations in the optical radiance of the motor exhaust plume. The periodicity of the variation is related to the length L of the rocket motor or speed of sound in the rocket motor combustion chamber to length ratio a/L. The optical radiance is collected and converted to electrical signals that are sampled at or above the Nyquist rate. An array of single-pixel photo detectors is well suited to provide amplitude data at high sample rates. The sampled data from the one or more detectors is assembled to form a high fidelity time sequence. A window of sampled data is processed to form a signal frequency spectrum. The mode structure in the frequency spectrum is related to the rocket motor length or speed of sound in the rocket motor chamber to length ratio. The rocket motor length or speed of sound to length ratio is used alone or in combination with other information to either classify or identify the rocket motor. [A412]

"Emergency action system for use with a locomotive"

An anti-collision system for railcars and locomotives and, more particularly, to a distance ranging and worker coupling protection system utilizes remote-sensing radar techniques for use with a locomotive and railcar. The anti-collision system may include an object detector device attached to a railcar or a locomotive that detects objects in a path of the railcar and the locomotive and a train display device electrically connected to the object detector device. The anti-collision system may also include an emergency action device which enables a crew member to stop the railcar or locomotive without communication to a locomotive operator when a hazard is recognized. The object detector device may include a remote sensor, a radio, and a microprocessor programmed to include data-logging to record and log all data from the anti-collision system. [A413]

"Guidance control system for vehicle driving operation"

A calculation method and apparatus for calculating a starting point for acceleration/deceleration operation of a vehicle with high accuracy using more input values while at the same time keeping calculation cost and time to a minimum is disclosed herein. An ECU making up a system calculates a start point for acceleration/deceleration operation of a vehicle on the basis of traveling condition information that changes as the vehicle travels and vehicle information that changes only slightly as a result of the travel of the vehicle. As a result, if the driver maintains a throttle operator at a given opening angle or more at a point before the start point, an actuator applies a force in the direction of closing a throttle valve to the throttle operator, thereby notifying the driver that the vehicle is close to the start point. [A414]

"Method for operating an environment monitoring system for a motor vehicle"

The invention relates to a method for operating an environment-monitoring system for a motor vehicle, by means of which the positions of objects in the environment laterally adjacent to, in front of, and behind the vehicle are determined. According to the invention, in order to improve the accuracy of the environment-monitoring system, the motion path is determined for a stationary object which the vehicle passes, and said motion path is used to determine the angular deviation with which the motion path determined for the stationary object deviates from the motion path of the vehicle. [A415]

"Lighting and/or signaling light-emitting device for vehicles"

A light-emitting device, notably a lighting and/or signaling device for a motor vehicle, including at least one first light source intended to emit a first modulated light beam coding information, at least one second light source intended to emit a second modulated light beam coding information, a control device adapted: to determine, on receiving information to be transmitted via the light-emitting device, if a first light beam intended to be emitted by the first source should be modulated to code the information to be transmitted and/or if a second beam intended to be emitted by the second source should be modulated to code the information to be transmitted, the determination depending on information relating to the local solar illumination, as a function of the determination, to modulate the first light beam and/or the energization second light beam to code the information to be transmitted. [A416]

"Vehicle alignment systems for loading docks"

Example vehicle alignment systems for use at loading docks are disclosed herein. An example vehicle alignment system includes a sensor system to detect a surface of a vehicle, where the sensor system obtains a feedback signal representative of a spatial orientation of the detected surface relative to a reference as the vehicle approaches a doorway of the loading dock. A controller detects a threshold deviation in the spatial orientation of the detected surface of the vehicle relative to the reference based on the feedback signal. A display varies an output signal in response to the detected deviation in the spatial orientation of the detected surface relative to the reference. [A417]

"Vehicle position validation"

Methods and computer-readable media are described herein for providing an automated validation of vehicle positioning and corresponding error notification. According to various aspects, a first position of a vehicle may be determined using a first positioning system. A second position of the vehicle may be determined using a second positioning system. An offset between the first and second positions of the vehicle may be determined. If the offset exceeds a threshold offset, a notification may be provided to indicate a potential error in the position of the vehicle. [A418]

"Multiplatform GMTI radar with adaptive clutter suppression"

The present invention is directed to a ground moving target (GMTI) radar that can detect targets, including dismounts, with very small minimum detectable velocities by combining signals from antennas on different spatially separated platforms in a main beam clutter-suppressing spatially adaptive process without requiring that the relative positions of the antenna phase centers be accurately tracked. The clutter nulling is in addition to that provided by the Doppler filters. The spatial displacement provides a narrow main beam clutter null reducing undesired target suppression. The clutter-suppressing spatially adaptive structure is used in both the sum and delta channels of the monopulse processor so that the beam distortion caused by the spatial nulling is compensated for, and the monopulse look-up process is preserved to maintain angle accuracy. Noncoherent integration is employed to recover signal to noise loss resulting from the uncertain relative locations of the platforms. [A419]

"Systems, methods, and apparatus for radar-based detection of objects in a predetermined space"

This disclosure provides apparatuses and methods for detecting foreign objects. An apparatus for detecting a presence of an object comprises at least one radar antenna attached to a wirelessly chargeable vehicle. The at least one radar antenna is configured to transmit a radar signal into a space between a wireless power receiver of the vehicle and a wireless charger as the vehicle moves in a primary direction of movement of the vehicle and receive the radar signal. The apparatus further comprises a radar processing circuit configured to determine a presence of the object in the space based on at least one characteristic of the received radar signal. The radar processing circuit is further configured to provide an indication to receive power from the wireless charger based at least in part on the determining the presence of the object. [A420]

"PMCW-PMCW interference mitigation"

A radar sensing system for a vehicle includes at least one transmitter, at least one receiver, and a processor. The at least one transmitter is operable to transmit a radio signal at one of a plurality of carrier frequencies. The at least one receiver is operable to receive a radio signal which includes a reflected radio signal that is the transmitted radio signal reflected from an object. The at least one receiver is operable to receive an interfering radio signal transmitted by a transmitter of another radar sensing system. The processor is operable to control the at least one transmitter to selectively transmit radio signals on one of the plurality of carrier frequencies. The processor is further operable to at least one of select a carrier frequency with reduced interference and avoid interference from the other radar sensing system. [A421]

"Automotive radar system and automotive radar sensor module with breather structure"

A housing for a radar sensor module has a back surface and a plurality of side surfaces connected to the back surface. A vent structure is connected to the back surface and at least one of the side surfaces. The vent structure includes an enclosure enclosing a chamber. A first opening in the vent structure penetrates the at least one of the side surfaces of the housing, such that the chamber is exposed to an exterior of the housing. A second opening in the vent structure penetrates the enclosure such that the chamber is exposed to an interior of the housing. [A422]

"Driving assistance apparatus and driving assistance system"

A driving assistance apparatus mounted to a first vehicle is provided as follows. A situation determination section determines whether a situation requires compromise between the first vehicle and a nearby vehicle. A target vehicle specification section specifies a second vehicle as a target vehicle that requires compromise with the first vehicle. A scheduled action specification section specifies a scheduled action content of the first vehicle when the situation requiring compromise is determined by the situation determination section. A transmission processing section transmits the scheduled action content specified by the scheduled action specification section to the second vehicle. A reception processing section receives acceptance and refusal information indicating acceptance or refusal of the scheduled action content from the second vehicle. A notification processing section issues a notification indicating whether the driver of the second vehicle accepts the scheduled action content, based on the received acceptance and refusal information. [A423]

"Use of motion data in the processing of automotive radar image processing"

In an example method, a vehicle configured to operate in an autonomous mode could have a radar system used to aid in vehicle guidance. The method could include a plurality of antennas configured to transmit and receive electromagnetic signals. The method may also include a one or more sensors configured to measure a movement of the vehicle. A portion of the method may be performed by a processor configured to: i) determine adjustments based on the movement of the vehicle, ii) calculate distance and direction information for received electromagnetic signals, and iii) recover distance and direction information for received electromagnetic signals with the adjustments applied. The processor may be further configured to adjust the movement of the autonomous vehicle based on the distance and direction information with adjustments applied. [A424]

"Indoor positioning with radio frequency chirp signal propagation delay measurement"

A radio frequency locator system and method. First, second and third reference devices are operable to transmit a plurality of spread spectrum chirp signals frequency offset from one another. An object device is operable to receive the plurality of spread spectrum chirp signals, the object device is further operable to evaluate the received plurality of spread spectrum chirp signals for relative phase shifts between the plurality of spread spectrum chirp signals and derive a fine propagation time between the reference devices and the object device using the phase shifts between the spread spectrum chirp signals. The reference devices determine their location independent of the object device and determine the location of the object device as a function of each of their locations and of their range to the object device. [A425]

"System and method for monitoring driving behavior"

A vehicle computing system for a vehicle includes a radar system, a microphone, and at least one controller. The radar system is configured to measure a distance to a frontward-vehicle. The microphone is configured to measure vehicle cabin noise. The controller is configured to output a tailgating event when the measured distance to the frontward-vehicle is less than a predefined threshold value. The controller may be further configured to request cabin noise from the microphone based on the tailgating event. If the noise is greater than a threshold value, the controller may output an alert message. [A426]

"System and method for mobile data expansion"

In a system of surface markers, each surface marker includes a housing having an upper surface with a clear top that, when the surface marker is on a vehicle travel surface, is raised with respect to the vehicle travel surface. The housing includes a battery and photoelectric converter, as well as a sensor detecting vehicles, a wireless transceiver at least transmitting data, and processing circuitry all powered by the battery or converter. The surface marker communicates location information for the surface marker to a mobile terminal, directly or indirectly via a network, and communicates information relating to the vehicle to a remote server within the network. Surface markers may communicate only with each other and mobile terminals, or also communicate with network access points to forward information from other surface markers. Each surface marker optionally includes a reflector around at least a portion of the housing. [A427]

"Electromagnetic absorber"

The invention concerns an electromagnetic absorbent comprising: a metal earth plane, an insulating dielectric substrate, disposed on said metal earth plane, a set of metal resonant elements disposed on said insulating dielectric substrate, the electromagnetic resonant frequency of a resonant element being adjusted by adapting the dimensions of the resonant element, the set of resonant elements comprising resonant elements with different dimensions so as to enable the production, by juxtaposition of different electromagnetic resonant frequencies, of a predetermined electromagnetic absorption band. An elementary pattern formed by a plurality of metal resonant elements can be replaced periodically. [A428]

"Millimeter wave antenna and radar apparatus for vehicle"

An millimeter wave antenna includes an antenna body adapted to transmit and receive an electromagnetic wave of a millimeter wave band, and a radome that covers a transmitting and receiving surface of the antenna body. The transmitting and receiving surface and the radorm are apart from each other and have a space therebetween. The radome includes a gap adapted to allow the electromagnetic wave of the millimeter wave band to pass through the gap. A radar apparatus for vehicle includes the millimeter wave antenna. [A429]

"Determination of mobile display position and orientation using micropower impulse radar"

Embodiments are generally directed to determination of mobile display position and orientation using micropower impulse radar. An embodiment of an apparatus includes a display to present images, radar components to generate radar signal pulses and to generate distance data based on received return signals, radar antennae to transmit the radar signal pulses and to receive the return signals, and a processor to process signals and data, wherein the processor is to: process the return signals received by the radar antennae to determine a position and orientation of the display with respect to real objects in an environment and to determine a position of a vantage point of a user of the apparatus, and generate an augmented image including rendering a virtual object and superimposing the virtual object on an image including one or more real objects, the rendering of the virtual image being based at least in part on the determined position and orientation of the display and the determined vantage point of the user of the apparatus. [A430]

"Method for representing objects surrounding a vehicle on the display of a display device"

A method represents objects of varying visibility surrounding a vehicle for a driver on a display device. The surroundings are automatically recognized by object recognition devices. for recognized objects, it is determined whether the respective object is a first object classified to be visible, or a second object classified to be invisible to the occupant. for a number of recognized objects including at least one first object and second object, respective positions of the objects are determined for the display, in the case of which the geometrical relationships between the number of objects correspond essentially to the real geometrical relationships. [A431]

"System for positioning a tool in a work space"

A system for assisting in the use by an operator of the operating element of a tool at desired locations at a worksite, includes a stationary control and a position sensor secured to the tool. The stationary control is located at the worksite, and has data stored therein specifying one or more desired locations for operation of the operating element of the tool at the worksite. A position sensor is mounted on the tool. The position sensor determines the position of the operating element of the tool. The position sensor includes a communication device for communicating with said stationary control, a sensor for determining its relative position with respect to said stationary control, and a display for providing indications to the user of the tool of the desired location for the operating element of the tool and of the actual location of the operating element of the tool. [A432]

"System and methods for intersection positioning"

A system and methods are provided for providing intersection positioning data. In one embodiment, a method includes detecting one or more objects by a device, wherein the one or more objects are detected relative to at least a portion of a roadway by an integrated radar sensor of the device, and tracking one or more detected objects by the device to determine tracking data, wherein tracking includes determining a number of detected objects, determining speed of the one or more detected objects and determining position of the one or more detected objects. The method may also include outputting the tracking data by the device. The system and methods may advantageously be employed for transmitting one or more of a collision warning, red light warnings, red light violation warnings and operation characteristics of objects during a traffic incident relative to intersection. [A433]

"Radar vehicle tracking"

Radar vehicle tracking is described. One or more embodiments include a device to receive a first determined distance between a first radar transceiver and a vehicle, the first distance determined by the first radar transceiver operating in a first mode, receive a second determined distance between a second radar transceiver and the vehicle, the second distance determined by the second radar transceiver operating in the first mode, receive a first determined distance ellipse between the first radar transceiver and the vehicle, the first distance ellipse determined by the first radar transceiver operating in a second mode, receive a second determined distance ellipse between the second radar transceiver and the vehicle, the second distance ellipse determined by the second radar transceiver operating in the second mode, and determine at least one location estimate of the vehicle based on the first and second determined distances and first and second determined distance ellipses. [A434]

"Hybrid pulse compression waveform for high resolution imaging"

A hybrid pulse compression RF system is provided herein in which an enhanced noise waveform and a hybrid waveform are generated to detect a target. for example, the system includes a signal generator that generates an LFM waveform and an enhanced waveform in sequence such that a transmitter of the system transmits the waveforms in the generated sequence in a direction of a possible target. The enhanced waveform may be a partially randomized version of the LFM waveform. If a target is present, the waveforms reflect off the target and are captured by the system in the sequence in which the originally generated waveforms are transmitted. Once captured, the reflected waveforms are processed by the system to generate a hybrid waveform for display such that the range and Doppler resolution and detection capabilities are significantly superior to the state of the art LFM or noise waveform RF systems. [A435]

"Vehicle periphery monitoring device"

A vehicle periphery monitoring device comprises: an in-region object detecting unit which detects an in-region object present in contact determination regions on the basis of a photographic image from a camera per prescribed control cycle, and a warning control unit which performs warning control processing to give warning of a detected in-region object when an in-region object was not detected in the last control cycle, but the in-region object was detected in the present control cycle, and to restrain warning of a new in-region object when an in-region object was detected in the last control cycle and the new in-region object different from the in-region object detected in the last control cycle has been detected in the present control cycle. [A436]

"Grain quality sensor"

A grain quality sensor comprising a lens, a filter, a photosite array, an illumination source, and an electronics module, wherein the illumination source directs light containing a known set of wavelengths onto a crop sample, wherein the lens picks up light reflected by the crop sample and directs it into the filter, which allows light to pass into different parts of the photosite array such that certain locations on the photosite array only get certain frequencies of the reflected light, wherein the electronics module is electrically connected to the photosite array and capable of determining which parts of the photosite array received light and what frequency the light received was, wherein the electronics module can analyze the optical data received by the photosite array, and wherein the analysis of the optical data is used to determine the composition of different parts of the crop sample. [A437]

"On-demand multi-scan micro doppler for vehicle"

A radar sensing system for a vehicle includes a transmitter, a receiver, a memory, and a processor. The transmitter transmits a radio signal and the receiver receives a reflected radio signal. The processor samples reflected radio signals during a plurality of time slices. The processor produces samples by correlating reflected radio signals to time-delayed replicas of transmitted radio signals. The processor accumulates the time slices into a first radar data cube and stores the first radar data cube in a memory. The processor combines a portion of the first radar data cube with a portion of a previously stored radar data cube. Based at least in part on the combined portions of the radar data cubes, the processor processes a time series that is a time series of the first radar data cube concatenated with a time series from the previously stored radar data cube. [A438]

"Target detection apparatus"

A target detection apparatus includes a first target detection section which detects a target which exists ahead of a vehicle and has a height sufficient to strike against the vehicle, a second target detection section which detects the target in an area different from an area in which the target is detected by the first target detection section, and a reliability degree setting section which sets a target reliability degree indicating probability that the target exists. When the target is detected only by the first target detection section or the second target detection section, and after the target is detected by both the first and the second target detection sections, the reliability setting section sets the target reliability degree based on an overlap detection time which is a period of time during which both the first and the second target detection sections continuously detect the target. [A439]

"In-vehicle control device"

An in-vehicle control device includes a first sensor that acquires obstacle information in a first detection range, a second sensor that acquires obstacle information in a second detection range, the second detection range is nearer to a host vehicle than the first detection range, and a processor configured to perform predetermined control for preventing collision with an obstacle or for reducing damage at collision time based on the obstacle information received from the first sensor and the second sensor and, when the obstacle is not detected by the first sensor and the second sensor after starting the predetermined control based on the obstacle information received from the first sensor, uses positional relation information to determine whether the predetermined control is to be continued wherein the positional relation information indicates a height-direction positional relation between a predetermined part of the obstacle and the first detection range or the second detection range. [A440]

"Algorithms for avoiding automotive crashes at left and right turn intersections"

A system and method for warning a driver of a host vehicle of a potential collision with other vehicles when turning at an intersection. The method includes determining if the host vehicle is likely to turn at the intersection, and if so, segmenting the intersection into a plurality of different regions, where each region has a different level of collision threat risk. The method obtains the speed, velocity and position of the host vehicle and any relevant remote vehicles in the intersection. The method determines a predicted path of the host vehicle and the predicted path of the remote vehicles. The method then determines whether the host vehicle and the remote vehicles will simultaneously occupy a collision zone in the intersection based on the predicted paths, and if so, issues a warning to the driver of the collision risk or apply vehicle controls to avoid or mitigate the collision risk. [A441]

"RFID and robots for multichannel shopping"

The present invention relates to systems, methods, and devices for consumers using RFID-tagged items for multichannel shopping using smartphones, tablets, and indoor navigation, preservation of consumer's privacy related to RFID-tagged items that they leave a retail store with, and automatically reading and locating retail inventory without directly using store labor. Robots and aerial mobile automated RFID reading devices are disclosed. [A442]

"Planar antenna and radar apparatus"

The planar antenna has a dielectric substrate, an antenna main body portion including first and second antenna elements on first and second sides, respectively, of the dielectric substrate and functioning as a balanced antenna, a signal line portion including first and second feed lines on the first and second sides, respectively, and a coplanar line on the first side and formed by a signal line and the first ground conductors, the signal line connected to the first feed line, a second ground conductor on the second side and connected to the second feed line, and via holes connecting the first ground conductors to the second ground conductor provided at ends of edges of the first ground conductors facing the end of the signal line where the signal line connects to the first feed line, to allow the first and second feed lines to function as balanced transmission lines. [A443]

"Detecting low-speed close-range vehicle cut-in"

A vehicle system includes an input device interface and a processing device. The input device interface receives a radar signal. The processing device defines a region of interest between a host vehicle and a front vehicle, detects that a potential cut-in vehicle has entered the region of interest, and selects the potential cut-in vehicle as the new front vehicle. The vehicle system may be incorporated into an autonomous or partially autonomous vehicle. [A444]

"Localisation system"

The invention pertains to a method for detecting a tag (100) in an area monitored by one or more beacons (200) , the tag (100) comprising a magnetic induction module (121) and a transmitter (140) , the method comprising the following steps at said tag: receiving, by means of said magnetic induction module, a first beacon message as variations in a magnetic field, said first beacon message comprising beacon information, extracting said beacon information from said first beacon message, and conditionally on said beacon information, transmitting a localisation message by means of said transmitter (140) . [A445]

"Radar level gauging"

Method for determining product surface distance in a tank comprising: i) generating a transmission signal as a first pulse train, ii) generating a reference signal having a second pulse train by time delaying said first pulse train, wherein each pulse in said first and second pulse trains have essentially identical waveforms and pulse repetition frequency, iii) guiding said transmission signal towards the product surface, iv) receiving a reflected signal, v) forming a correlation value based on a time correlation between the reference signal and the reflected signal, vi) carrying out steps i) to v) in sequence for at least three different pulse repetition frequencies, until at least three pairs of correlation values and associated pulse repetition frequencies have been stored, vii) determining said distance based on said at least three pairs of correlation values and associated pulse repetition frequencies, and said fixed time delay. [A446]

"RTT processing based on a characteristic of access points"

Systems, apparatus and methods for estimating a location of a mobile device are presented. Before computing a location estimate, the mobile device groups a plurality of access points into two or more categories (for example, a first list of access points having a first characteristic and a second list of access points having a second characteristic) . Round-trip time (RTT) measurements are computed for access points in the first list. A Short Interframe Space (SIFS) value may be determined for each access point in the first list or generally SIFT representing the first list as a whole. The RTT measurements are compensated with the appropriate SIFS value. The mobile device then computes its location or position fix estimate using the compensated RTT values while excluding less accurate RTT values from other access points. As a result, the location estimate eliminates adverse influent from some access points. [A447]

"Authenticated time-of-flight indoor positioning systems and methods"

This disclosure describes systems, methods, and computer-readable media related to testing tools for devices. In some embodiments, a plurality of public keys may be received from a server via a secured network connection where each of the plurality of keys corresponds to a respective private key associated with an access point. A time-of-flight (ToF) measurement protocol may be initiated with one or more access points. Data generated by ToF measurement protocol with the one or more access points may be received. In some embodiments, the one or more access points may be authenticated based at least in part on the plurality of public keys. A location of a user device may be determined based at least in part on the received data. [A448]

"Systems with interactive management of environmental objects relative to human appendages"

Systems are described for analyzing an environment. A system embodiment includes, but is not limited to, a plurality of tags, at least one tag configured to be coupled to a substrate, at least one other tag configured to be coupled to an environmental object, a remote reader positioned remotely from the plurality of tags and configured to distinctly identify each of the plurality of tags, a processor operably coupled to the remote reader and configured to receive one or more output signals from the remote reader, the one or more output signals corresponding to a threshold associated with the at least one tag coupled to the substrate and the at least one other tag configured to be coupled to the environmental object, and an output reporter operably coupled to the processor and configured to generate one or more communication signals responsive to instruction by the processor. [A449]

"Systems and methods for ultrasonic velocity and acceleration detection"

The present disclosure provides systems and methods associated with determining velocity and/or acceleration information using ultrasound. A system may include one or more ultrasonic transmitters and/or receivers. An ultrasonic transmitter may be configured to transmit ultrasound into a region bounded by one or more surfaces. The ultrasonic receiver may detect a Doppler shift of reflected ultrasound to determine an acceleration and/or velocity associated with an object. The velocity and/or acceleration information may be utilized to modify the state of a gaming system, entertainment system, infotainment system, and/or other device. The velocity and/or acceleration date may be used in combination with a mapping or positioning system that generates positional data associated with the objects. [A450]

"Low cost 3D radar imaging and 3D association method from low count linear arrays for all weather autonomous vehicle navigation"

A low cost, all weather, high definition RF radar system for an autonomous vehicle is described. The high definition RF radar system generates true target object data suitable for imaging, scene understanding, and all weather navigation of the autonomous vehicle. The high definition RF radar system includes a pair of independent orthogonal linear arrays. Data from both linear arrays is fed to a processor that performs data association to form true target detections and target positions. A Boolean association method for determining true target detections and target positions reduces many of the ghosts or incorrect detections that can produce image artifacts. The high definition RF radar system provides near optimal imaging in any dense scene for autonomous vehicle navigation, including during visually obscured weather conditions such as fog. [A451]

"Hand-held radar device with direct printing based on radar input"

The disclosed technology includes a device and method of use for direct printing and ink or other marking, in conjunction with GPR techniques. In a most basic embodiment of the disclosed technology, a relevant date, time, filename, and other parameters are printed or otherwise physically exhibited on the measurement surface, so that RADAR files can be later attributed to a specific data collection site. In a more advanced embodiment of the disclosed technology, actual RADAR target information is printed, or otherwise physically exhibited, on the measurement surface, such as while measuring, or substantially while measuring, the surface and substrate beneath with GPR. [A452]

"Method and device for determining distance and radial velocity of an object by means of radar signal"

The present invention relates to a method for determining distance (R) and radial velocity (v) of an object in relation to a measurement location, in which method radar signals are emitted and after reflection on the object are received again at the measurement location, wherein the emitted radar signals are subdivided within a measuring cycle into numerous segments (10) in which the frequency of the radar signals is gradually changed from an initial value (f.sub.A, f.sub.B) to the end value and each received reflected signal is subjected across one segment (10) to a first evaluation to detect frequency peaks and additionally a subsequent second evaluation of the signals for the frequency peaks of all segments (10) of the measuring cycle is carried out to determine a Doppler frequency component as a measure of the radial velocity (v) . According to said method, an ambiguity in the determination of the relative velocity (v) is eliminated by subdividing the segments (10) into at least two groups (A, B) , the initial value (f.sub.A, f.sub.B) of which and/or end value of the changing frequency are different, by subjecting the segments (11, 12) of each group (A, B) separately to the second evaluation and by determining a phase difference of the signals occurring during the second evaluation of the segments (11, 12) of each group (A, B) and corresponding to each other, thereby removing ambiguities in the determined velocity. [A453]

"Topology determination for bulk materials"

For determining the topology of a bulk material surface, a series of echo curves are detected in different primary radiation directions of the antenna. Subsequently, for each distance cell of the echo curves, the maximum of all of the echo curves is determined and the distance thereof is plotted as a function of the coordinates thereof so as to obtain an image of the topology of the bulk material surface in two or three dimensions. [A454]

"Range sidelobe suppression"

A system, apparatus, and method for receiving a signal. In one implementation, the system includes a receiver, a correlator, and a range sidelobe envelope generator. The receiver receives the signal. The correlator compresses the signal with a reference signal. The range sidelobe envelope generator generates a range sidelobe envelope function based on the compressed signal. [A455]

"Proximity detection systems and methods"

Methods and systems for detecting a person located around a piece of equipment. One system includes processor configured to define a first virtual zone around a piece of equipment, determine a location of a person, and define a second virtual zone around the person at the location. As the location of the person changes, the processor is further configured to determine a direction of travel of the person, and automatically modify the second virtual zone to extend a first distance in the direction of travel of the person and extend in a second distance opposite the direction, wherein the first distance is greater than the second distance. In response to at least a portion of the second virtual zone overlapping with at least a portion of the first virtual zone, the processor is configured to perform at least one action. [A456]

"Automated setting of cruising speeds"

An approach to setting a cruise control speed based on identifying a vehicle operator and analyzing metadata associated with the vehicle operator. The identity of the vehicle operator and any passengers is determined based on identity sensors in the vehicle or by manual identity entry. Metadata, associated with the vehicle operator, is retrieved from the metadata database, located either locally or remotely. The metadata is analyzed based on factors such as the current route and the identity of any passengers. The cruise control speed is set based on the results of the analysis. Any changes to the setting are updated in the metadata database. [A457]

"Adaptive cruise control with on-ramp detection"

Methods and systems for controlling the speed of a host vehicle during an on-ramp merging situation. One method includes identifying a position of an upcoming on-ramp merging with a lane where the host vehicle is currently traveling based on lane markings identified in an image captured by a forward-facing image sensor mounted on the host vehicle, detecting a merging vehicle on the upcoming on-ramp, and determining a speed of the merging vehicle. The method also includes automatically, at a control unit, adjusting a speed of the host vehicle based on the speed of the merging vehicle. [A458]

"Sensor system for motor vehicle"

There is set forth herein in one embodiment a system for detecting physical objects within a perimeter. The system can include one or more sensors configured to be supported by a motor vehicle. The system can include a processing system and the processing system can be configured to detect a physical object moving within the perimeter based on an output of the one or more sensors. The processing system can be configured to transmit a notification responsive to detecting a person approaching the motor vehicle. [A459]

"Advanced warning and risk evasion system and method"

This invention relates in general to the field of safety devices, and more particularly, but not by way of limitation, to systems and methods for providing advanced warning and risk evasion when hazardous conditions exist. In one embodiment, a vicinity monitoring unit is provided for monitoring, for example, oncoming traffic near a construction zone. In some embodiments, the vicinity monitoring unit may be mounted onto a construction vehicle to monitor nearby traffic and send a warning signal if hazardous conditions exist. In some embodiments, personnel tracking units may be worn by construction workers and the personnel tracking units may be in communication with the vicinity monitoring unit. In some embodiments, a base station is provided for monitoring activities taking place in or near a construction site including monitoring the locations of various personnel and vehicles within the construction site. [A460]

"Methods and systems for a ranging protocol"

Disclosed are methods and systems for obtaining measurements of a range between devices based on a Round Trip Time (RTT) for an exchange messages. In particular, described are techniques for sharing channel parameters between or among wireless transceiver devices to assist in initiating exchange of signals between neighboring wireless transceiver devices. [A461]

"Systems and methods for detecting soil characteristics"

A soil detection and planting apparatus. The apparatus includes a vehicle and a controller coupled to the vehicle. The apparatus further includes a planting device coupled to the vehicle, the planting device configured to plant seeds or plants into a soil material. The apparatus includes a ground penetrating radar sensor coupled to the vehicle. The ground penetrating radar soil sensor is configured to scan the soil material up to a designated depth beneath a surface of the soil material, wherein the ground penetrating radar soil sensor is further configured to provide a sensor feedback signal to the controller with respect to an intrinsic characteristic of the soil material. The controller is configured to instruct placement of a seed or a plant into the soil material based on the feedback signal. [A462]

"Vehicle radar control"

Methods and systems are provided for controlling a radar system of a vehicle. One or more transmitters are configured to transmit radar signals. A plurality of receivers are configured to receive return radar signals after the transmitted radar signals are deflected from an object proximate the vehicle. A processor is coupled to the plurality of receivers, and is configured to generate a plurality of feature vectors based on the returned radar signals and generate a three dimensional representation of the object using the plurality of feature vectors. [A463]

"Vehicle radar with beam adjustment"

Methods and systems are provided for controlling a radar system of a vehicle. Sensor information pertaining to an environment for the vehicle is received from a first sensor as the vehicle is operated. A beam of the radar system is adjusted by a processor based on the sensor information. [A464]

"RFID tag locationing using dynamic beacon tag association"

A method and apparatus for determining the position of a RFID tag. The method includes the following: (1) measuring the position of an active device to an accuracy of better than 1.0 meter using a radio locating system to determine the position of a reference point, (2) detecting a first RF signal from a reference RFID tag near the reference point with an RF receiver in an RFID reading system, (3) detecting a second RF signal from a RFID tag of interest with the RF receiver in the RFID reading system, and (4) processing both the first RF signal and the second RF signal and relying upon at least partially the position of the reference point to determine the position of the RFID tag of interest. [A465]

"Vehicle upper portion structure"

A vehicle, to which a vehicle upper portion structure is applied, has: a peripheral information detecting sensor that is mounted to a vehicle upper portion, and that has a detecting section that obtains peripheral information of the vehicle by detecting a detection medium, and a roof panel that covers the peripheral information detecting sensor from a vehicle upper side, and at which at least a region, that faces the detecting section, is formed of a material that transmits the detection medium therethrough. [A466]

"Sensor abnormality detection device"

A sensor abnormality detection device includes a first sensor that detects a situation of a first region at a periphery of an own vehicle, a second sensor that detects a situation of a second region, which is a region different from the first region and includes an overlapping region that overlaps a part of the first region, a sensor abnormality determination means that determines abnormality of the first sensor and the second sensor, and a collision detection means that detects collision of the own vehicle to an object, wherein the sensor abnormality determination means determines that at least one of the first sensor and the second sensor has abnormality when the first region and the second region do not overlap in the overlapping region after the collision is detected. [A467]

"Driver assistance apparatus and method for operating the same"

A method for operating a driver assistance apparatus includes: recognizing a driving environment of a vehicle, determining a driving mode based on the driving environment, determining whether the vehicle is driven using at least one sensor based on the driving mode, and controlling steering and braking of the vehicle based on whether the vehicle is driven using the at least one sensor. [A468]

"Enhanced sound generation for quiet vehicles with vehicle-to-vehicle communication capabilities"

Two or more quiet vehicles traveling together sense each other and communicate to each other the condition of the respective drivers of the vehicles and announce their presence to pedestrians and other motorists using noise sounds. The characteristics of the emitted sounds are selected according to a level of threat presented by the quiet vehicles. [A469]

"UWB measuring device"

A UWB measuring device, in particular a hand-held positioning device, includes at least one signal-generating unit for generating at least one first UWB measuring signal, which is intended for a UWB measurement. The signal-generating unit is provided for generating a second measuring signal that differs from the first UWB measuring signal in at least one signal parameter. The second measuring signal is intended to detect a distance from an examination object and/or contact with the examination object. [A470]

"Position location for wireless communication systems"

The subject matter disclosed herein relates to position location in a wireless communication system, and may more particularly relate to position location for a mobile station. [A471]

"Cyclic shift delay detection using signaling"

Systems, apparatus and methods for determining a cyclic shift diversity (CSD) mode are presented. Examples communicate the CSD mode in a signaling message. Specifically, a CSD mode is set in an access point the sent to a mobile device. The signaling messages may be either a point-to-point message or a broadcast message. The access point or location server may set the current CSD mode from a plurality of mobile devices by crowd sourcing. for example, the plurality of mobile devices may report what CSD mode was detected. Alternative, the plurality of mobile devices may send a channel impulse response (CIR) , or the like, to a location server and the location server may determine what CSD mode is currently used by the access point. [A472]

"System and method for tracking motion"

Detecting position information related to a face, and more particularly to an eyeball in a face, using a detection and ranging system, such as a Radio Detection and Ranging ("RADAR") system, or a Light Detection and Ranging ("LIDAR") system. The position information may include a location of the eyeball, translational motion information related to the eyeball (e.g., displacement, velocity, acceleration, jerk, etc.) , rotational motion information related to the eyeball (e.g., rotational displacement, rotational velocity, rotational acceleration, etc.) as the eyeball rotates within its socket. [A473]

"Crop quality sensor based on specular reflectance"

A crop quality sensor, comprising an illumination source, an imaging device, and a processor executing application software. The illumination source is shone onto a crop sample, and an image is taken with the imaging device of the illuminated crop sample. The software executing on the processor is used to analyze the image to identify the outlines of individual kernels and to identify which of those outlines contain a specular highlight, indicative that the kernel is whole and unbroken, while the absence of such a specular highlight is indicative of a broken kernel.

[A474]

"Proximity sensing using EHF signals"

A system for sensing proximity using EHF signals may include a communication circuit configured to transmit via a transducer an EM signal at an EHF frequency, and a proximity sensing circuit configured to sense a nearby transducer field-modifying object by detecting characteristics of a signal within the communication circuit. A system for determining distance using EHF signals may include a detecting circuit coupled to a transmitting communication circuit and a receiving communication circuit, both communication circuits being mounted on a first surface. The transmitting communication circuit may transmit a signal toward a second surface, and the receiving communication circuit may receive a signal relayed from the second surface. The detecting circuit may determine distance between the first surface and a second surface based on propagation characteristics of the signals. [A475]

"Planar antenna microwave module"

The present invention discloses a planar antenna microwave module, including an oscillation circuit board and a planar antenna board. The oscillation circuit board is a double-sided printed circuit board. The planar antenna board is a double-sided PCB independent of the oscillation circuit board. PCB copper foil of the planar antenna board forms a transmitting/receiving planar antenna. The planar antenna is laminated on a bottom surface of the oscillation circuit board by using a solder joint that runs through and electrically connects two layers of PCB copper foil, and is electrically connected to the oscillation circuit board through the solder joint. The antenna boards in the present invention are of independent and separate structures, and have a small design size, a simple manufacturing process, a short production cycle, low costs, and high economic benefits. [A476]

"Learning lanes from radar data"

Systems, methods, and apparatuses are disclosed for determining lane information of a roadway segment from vehicle probe data. Probe data is received from radar sensors of vehicles at a road segment, where the probe data includes an identification of static objects and dynamic objects in proximity to the respective vehicles at the road segment, and geographic locations of the static objects and the dynamic objects. A reference point, such as a road boundary, at the road segment is determined from the identified static objects. Lateral distances between the identified dynamic objects and the reference point are calculated. A number of lanes at the road segment are ascertained from a distribution of the calculated distances of the identified dynamic objects from the reference point. [A477]

"Autonomous vehicle providing services at a transportation terminal"

Methods and systems are provided for providing services to an individual at a transportation terminal. In one method, an item is received with a mobile robot from an individual at a first location at the transportation terminal. The item is autonomously secured with the mobile robot using a component of the mobile robot to thereby prevent unauthorized individuals from accessing the secured item. The secured item is autonomously transported with the mobile robot from the first location to a second location at the transportation terminal. The mobile robot is capable of independent navigation without need for physical or electromechanical guidance devices in an environment within which the mobile robot operates. [A478]

"Vehicular radar sensing system utilizing high rate true random number generator"

A radar sensing system for a vehicle includes transmit and receive pipelines. The transmit pipeline includes transmitters able to transmit radio signals. The receive pipeline includes receivers able to receive signals. The received signals are transmitted signals that are reflected from an object. The transmit pipeline phase modulates the signals before transmission, as defined by a first binary sequence. The receive pipeline comprises an analog to digital converter (ADC) for sampling the received signals. The transmit pipeline includes a pseudorandom binary sequence (PRBS) generator for outputting a second binary sequence of bits with an equal probability of 1 and 0. The first binary sequence is defined by least significant bit (LSB) outputs from the ADC and the second binary sequence of bits. The first binary sequence comprises a truly random unbiased sequence of bits with an equal probability of 1 and 0. [A479]

"Methods and systems for vehicle radar coordination and interference reduction"

A method is provided that includes a vehicle receiving data from an external computing device indicative of at least one other vehicle in an environment of the vehicle. The vehicle may include a sensor configured to detect the environment of the vehicle. The at least one other vehicle may include at least one sensor. The method also includes determining a likelihood of interference between the at least one sensor of the at least one other vehicle the sensor of the vehicle. The method also includes initiating an adjustment of the sensor to reduce the likelihood of interference between the sensor of the vehicle and the at least one sensor of the at least one other vehicle responsive to the determination. [A480]

"Wheel fixing unit for car sensor calibration and calibration device using the same"

A wheel fixing unit includes: a body, a plurality of wheel connectors protruding forward from the body and connected to a tool connection hole in a wheel of a vehicle, and a cable connector protruding rearward from the body and including a connection terminal formed on a protruding end side such that a cable is connectable thereto. A calibration device using the wheel fixing unit includes: wheel fixing units respectively coupled to left and right wheels of a vehicle, a target board installed spaced apart in a direction corresponding to a vehicle body and configured such that a transmission signal of a sensor mounted on a front or rear surface of the vehicle body is reflected by a reflector and is incident on the sensor, and an interval maintaining cable connected to one end of the wheel fixing unit and one of the both sides of the target board. [A481]

"Locating device"

A locating device, particularly a handheld locating device, includes a housing, a display unit, and a locating unit, which is provided in order to detect a presence of an item arranged in an examination object by means of a measurement signal and which comprises an arithmetic unit. The arithmetic unit determines an orientation of an item image relative to a reference variable. [A482]

"Apparatus and method for detection"

A detection device for detecting an OUD (Object Under Detection) includes a transceiver, a first antenna element, and a second antenna element. The transceiver has a transmitter port and a receiver port. The first antenna element is coupled to the transmitter port of the transceiver. The second antenna element is coupled to the receiver port of the transceiver. The transceiver transmits an electromagnetic signal through the first antenna element to the OUD, and then receives a reflective signal through the second antenna element from the OUD. The electromagnetic signal has a first polarization direction, and the reflective signal has a second polarization direction. [A483]

"Visualization of 3-D GPR data in augmented reality"

In one embodiment, an augmented reality application generates an augmented reality view that displays three-dimensional (3-D) ground penetrating radar (GPR) data on boundary surfaces of a virtual excavation. The augmented reality application calculates an intersection of the one or more boundary surfaces of the virtual excavation and the 3-D GPR data, and extracts data items of the 3-D GPR data that intersect the one or more boundary surfaces of the virtual excavation. The augmented reality application then projects two-dimensional (2-D) images based on the extracted data items onto the one or more boundary surfaces of the virtual excavation to show subsurface features in the augmented reality view that can be manipulated (e.g., moved, rotated, scaled, have its depth changed, etc) by a user. [A484]

"X-band surface mount microstrip-fed patch antenna"

An antenna array for use with an X-band weather radar system comprises a printed circuit board, a plurality of antenna elements, and a plurality of integrated circuit packages. The printed circuit board includes a first side and an opposing second side. The antenna elements are configured to transmit and receive radio waves at frequencies in the X-band. The antenna elements are electrically connected to the first side of the printed circuit board and positioned thereon in a two-dimensional array. A center of each antenna element is located on a point of a grid with grid points orthogonally spaced apart. Each integrated circuit package includes a transmitter electronic circuit and a receiver electronic circuit that are each in electronic communication with one antenna element. Each integrated circuit package is positioned on the first side of the printed circuit board to underlie one antenna element. [A485]

"Vehicle collision avoidance system"

A vehicle collision avoidance system that utilizes signal emitters and receivers positioned around the periphery of vehicles to detect nearby vehicles. Upon detection of a nearby vehicle, the system may execute any of a variety of predefined responses based on the distance from the local vehicle to the detected nearby vehicle. [A486]

"Collision probability determination apparatus and program"

A collision probability determination apparatus includes a specifying means for specifying target positions on an X-Y plane, a calculation means for calculating a target path and calculating a predicted arrival position of the target on an X-axis, a determination means for determining probability of a collision between the vehicle and the target based on the predicted arrival position, and a calculation origin changing means for defining the target position specified last time as a last specified value, and defining the target position specified this time as a current specified value, and for, when detecting that the target path, whose end point is the last specified value, is a straight line and then if a difference value between X-coordinates of the last specified value and the current specified value exceeds a predetermined threshold, changing a calculation origin of the target path to the last specified value or the current specified value. [A487]

"Radar apparatus and signal processing method"

There is provided a radar apparatus. A predicting unit predicts a current peak signal based on a pervious determined peak signal. An extracting unit extracts a current peak signal corresponding to the predicted peak signal, from among peak signals existing within a predetermined range of the frequency. A filtering unit performs a filtering process on the predicted peak signal and the current peak signal, and output a result of the filtering process as a current determined peak signal. If the target derived based on the current peak signal is a preceding vehicle existing in front of an own vehicle equipped with the radar apparatus, the filtering unit changes whether to perform the filtering process according to a state of the preceding vehicle. [A488]

"Localisation system"

The invention pertains to a method and system for determining a location of an identification tag (100) in a monitored area. The method comprises using a plurality of beacons (200) to broadcast (2010) beacon messages comprising an identification element relating to the originating beacon, receiving (2020) at a first set of beacons a localization message from an identification tag (100) , the tag having received (1010) a beacon message, extracted (1020) the identification element from the received beacon message, and transmitted (1030) information related to the identification element as part of the localization message, performing (3010) a first level of localization of the tag on the basis of characteristics of the respective copies of the localization message received at the first set of beacons, and performing (3020) a second level of localization of the tag on the basis of the information related to the identification element. [A489]

"Ranging and/or localization service based on mobile device privilege"

Example methods, apparatuses, or articles of manufacture are disclosed herein that may be utilized, in whole or in part, to facilitate or support one or more operations or techniques for a ranging and/or localization service based, at least in part, on mobile communication device privilege, for example. [A490]

"Method and system for wireless power supply"

In a method and system for wireless power supply, the misalignment between the power transmission antenna and the power reception antenna is detected based on the electric power of an electromagnetic wave radiated from the position-detection power transmission antennas of the power transmission antenna, reflected by a reflector provided outside the power reception surface of the power reception antenna, and detected by the position-detection power reception antennas of the power transmission antenna. [A491]

"Combined antenna, antenna array and method for using the antenna array"

An antenna including a dipole antenna element having central feeding points, a common mode rejection filter, a first length of a two-conductor transmission line, and a common mode rejection filter arranged and connected between a far end of the first length of the two-conductor transmission line and the feeding points of the dipole antenna element. The first length of the two-conductor transmission line is arranged to extend from a ground plane to a first height where the first length of the two-conductor transmission line is connected to the common mode rejection filter. [A492]

"Radar sensor device having an adjusting mirror"

A radar sensor device for motor vehicles, having a sensor housing, which includes a radome, a fastening section having an engagement contour for a fastening element which is in engagement with the engagement contour and carries a mirror-reflective region, and further fastening sections having engagement contours that are suitable for the engagement of such a fastening element, to fasten the radar sensor device in the installation location in the motor vehicle, and a method for fastening a mirror to a radar sensor device for motor vehicles. Fastening elements of a similar type, which are suitable for the engagement with engagement contours of fastening sections of the radar sensor device, are provided, and at least one of the fastening elements is provided with a mirror-reflective region, so that a mirror is formed, and the fastening elements are fastened to the fastening sections. [A493]

"Method for operating an ultrasonic sensor of a driver assistance system in a motor vehicle, driver assistance system, and motor vehicle"

The invention relates to a method for operating at least one ultrasonic sensor (4, 6) of a driver assistance system (2) in a motor vehicle (1) , wherein an output sound signal (S.sub.A) of the ultrasonic sensor (4, 6) is modulated in accordance with a type of modulation and by means of this modulation, a specific codeword is impressed on the output sound signal (S.sub.A) . for at least two mutually different functionalities (8 to 12) of the driver assistance system (2) , different types of modulation are in each case used for the modulation of the output sound signal (S.sub.A) and/or in each case different lengths of the codeword. [A494]

"Method for setting a detection threshold for a received signal of a frequency-modulated continuous wave radar sensor of a motor vehicle on the basis of the noise level, radar sensor and motor vehicle"

A method for setting a detection threshold for a received signal of a frequency-modulated continuous-wave radar sensor of a motor vehicle is disclosed. In successive measuring cycles of the radar sensor in each case a radar signal is emitted into a capture zone of the radar sensor and a received signal is received, in each measuring cycle a frequency spectrum relating to the respective received signal is determined, wherein individual frequency bins of the frequency spectrum each correspond to a signal level in a range-resolution cell, and the detection threshold is set individually in each case for a subset consisting of at least one frequency bin, and in order to set the detection threshold, a noise level is determined from frequency bins of temporally preceding measuring cycles and/or from frequency bins of adjacent Doppler-resolution cells of the frequency spectrum. [A495]

"Smartphone-based vehicle control methods"

Method for controlling a vehicle including a smartphone-engaging coupling element. Data about operational status of the vehicle is transferred from one or more vehicle-resident systems to a smartphone when the smartphone is engaged with the coupling element. Commands are received by the vehicle from the smartphone when the smartphone is engaged with the coupling element, which commands being based in part on data previously transferred from the vehicle-resident system (s) to the smartphone when the smartphone is engaged with the coupling element. A vehicular system, e.g., seat positioning system, mirror positioning system, passenger compartment temperature control system, route guidance or navigation system, changes its operation in accordance with the commands received by the vehicle from the smartphone when the smartphone is engaged with the coupling element. [A496]

"Methods and systems for enhanced round trip time (RTT) exchange"

Disclosed are systems, methods and devices for obtaining round trip time measurements for use in location based services. In particular implementations, a fine timing measurement request message wirelessly transmitted by a first transceiver device to a second transceiver device may permit additional processing features in computing or applying a signal round trip time measurement. Such a signal round trip time measurement may be used in positioning operations. [A497]

"Method for amplifying an echo signal suitable for vehicle surroundings detection and device for carrying out the method"

A method for amplifying an echo signal, in which an analog echo signal suitable for detection of a vehicle's surroundings is amplified by a gain dependent on the transit time of the echo signal, the analog echo signal being amplified by an amplifier having a plurality of outputs, each having a different gain, and a downstream A/D converter having a time-variable reference voltage. In the process, there is a switch between the different outputs of the amplifier at predefined switching points in time, and the reference voltage of the A/D converter varies over time between the switching points in time in such a way that the echo signal is present at the output of the A/D converter with a transit time-dependent total gain having a predefined characteristic. [A498]

"Utilization of motion and spatial identification in mobile RFID interrogator"

A system and method of using motion or spatial identification technology with a mobile RFID reader to detect whether an RFID tag is part of a forklift load or other ambulatory space such as a shopping cart receptacle, includes determining whether a tag is within a defined space and/or whether a tag is in motion relative to a mobile RFID reader. The system and method determines whether a particular RFID tag is part of a forklift load/space, has been added to or removed, is an extraneous tag, etc. [A499]

"Marine radar based on cylindrical array antennas with other applications"

An all-solid-state marine radar technology based on a non-rotating cylindrical array antenna is described. Multiple transmit/receive (T/R) modules are used to form the antenna beam, which allows the beam sequencing, the dwell time in each beam position, the resolution, and the beam shape to be varied in order to make best use of the available energy. Waveforms with a high duty ratio can be used on transmit in order to make efficient use of solid-state power amplifiers. High resolution in both range and Doppler provides high measurement accuracy and superior performance in clutter. Alternate embodiments, including continuous waveform embodiments are disclosed. [A500]

"Mobile radar system"

A radar system that includes a gimbal and a platform secured to a frame through the gimbal is disclosed. The radar system includes an antenna rotatably supported by the platform for rotation about an axis and configured to scan a hemispherical field of view above the platform. A controller that controls the rotation of the antenna and a gyroscopic stabilizer that is secured to the platform to maintain the platform in a stable and level position during operation of the radar system and rotation of the antenna is also disclosed. A vehicle is also disclosed for traversing a geographic region with the radar system. The antenna may transmit in the X band. A telescoping mast having a first end secured to the platform and having a second end secured to the gimbal is also disclosed. [A501]

"Sensor suite and signal processing for border surveillance"

A land-based Smart-Sensor System and several system architectures for detection, tracking, and classification of people and vehicles automatically and in real time for border, property, and facility security surveillance is described. The preferred embodiment of the proposed Smart-Sensor System is comprised of (1) a low-cost, non-coherent radar, whose function is to detect and track people, singly or in groups, and various means of transportation, which may include vehicles, animals, or aircraft, singly or in groups, and cue (2) an optical sensor such as a long-wave infrared (LWIR) sensor, whose function is to classify the identified targets and produce movie clips for operator validation and use, and (3) an IBM CELL supercomputer to process the collected data in real-time. The Smart Sensor System can be implemented in a tower-based or a mobile-based or combination system architecture. The radar can also be operated as a stand-alone system. [A502]

"Method for determining the location of a remote transmitter positioned near a vehicle"

A method for determining the location of a remote transceiver in relation to a vehicle, the method including the steps of: transmitting at least two measuring signals to the remote transceiver, each of the measuring signals being transmitted from a different one of a plurality of n antennae positioned relative to the vehicle, where n denotes an integer.gtoreq.2, receiving an acknowledgement signal from the remote transmitter in response to each measuring signal, each acknowledgement signal including a received signal strength indication (RSSI) for a respective received measuring signal, the values of the received RSSIs together defining a data point in an RSSI domain, and determining a difference between the received value of a first RSSI and a defined threshold value for that first RSSI, wherein the sign of the difference indicates whether the remote transmitter is inside or outside a defined region i of or near the vehicle. [A503]

"Augmented reality HUD display method and device for vehicle"

An augmented reality head-up display (HUD) display method for a vehicle includes: detecting a position of an object outside of the vehicle at which a driver of the vehicle is looking, detecting a position of an eye of the driver while the driver is viewing external object information displayed on a windshield of the vehicle, extracting augmented reality HUD display coordinates of the object based on the detected object position and augmented reality HUD display coordinates of the eye based on the detected eye position, correcting one or more errors in the augmented reality HUD display coordinates of the object and one or more errors in the augmented reality HUD display coordinates of the eye using an error correction parameter for the augmented reality HUD display coordinates of the object and an error correction parameter for the augmented reality HUD display coordinates of the eye, the error correction parameters varying from one another, receiving the corrected augmented reality HUD display coordinates of the object and the corrected augmented reality HUD display coordinates of the eye, and displaying augmented reality HUD graphics of the external object information on the windshield based on the received corrected augmented reality HUD display coordinates. [A504]

"Radar apparatus and running vehicle sensing method"

A radar receiver of a radar apparatus includes a Doppler frequency acquirer which, in operation, acquires a Doppler frequency for each of range bins from an echo signal, received via at least one antenna, which is a radar signal reflected by an object, a direction correlation power value calculator which, in operation, calculates, for each of combinations of the range bins and the Doppler frequencies, a direction correlation power value indicating strength of the echo signal for each of directions, a normalized direction correlation value calculator which, in operation, calculates, for each of the combinations of the range bins and the Doppler frequencies, a normalized direction correlation value indicating likelihood of a direction of arrival of the echo signal for each of the directions, and a running vehicle detector which, in operation, determines, on a basis of the direction correlation power value and the normalized direction correlation value, whether the object is a running vehicle. [A505]

"Object detection device for a vehicle and vehicle having the object detection device"

An object detection device for a vehicle monitors the surroundings at the rear of the vehicle. The object detection device has a radar sensor for generating a radar signal containing information about a distance between the vehicle and a vehicle user or another object in the surroundings. The radar sensor mounts on a vehicle component pointing toward the surroundings to the rear of the vehicle. Furthermore, the object detection device contains a control and evaluation unit for determining a movement pattern of the vehicle user on the basis of the radar signal, and to compare the movement pattern with a predefined reference pattern and to actuate a servomotor which has the purpose of actuating the tailgate between an open position and a closed position when the movement pattern corresponds to the reference pattern. Furthermore, a vehicle ideally has such an object detection device. [A506]

"Integrated system for combating improvised explosive devices"

The system comprises an orientable block, in which are mounted at least transmission and reception antennas of means for detecting improvised explosive devices, which are directed in such a way as to illuminate at least one and the same zone of space, and a detection confirmation camera which is directed towards the zone illuminated by these transmission and reception antennas in such a way as to be able to form an image of this zone, as well as means for controlling the orientation of said orientable block, which bring about a displacement of said block in such a way as to generate a scan of a part of space by said detection means. [A507]

"In-vehicle radar apparatus"

An in-vehicle radar apparatus includes a transmission and reception means which transmits a radar wave ahead of an own vehicle and receives a reflected wave corresponding to the radar wave from a target, a reception strength detection means which repeatedly detects reception strength of the reflected wave, a distance detection means which repeatedly detects a distance from the own vehicle to the target, an approximate expression calculation means which calculates an approximation expression expressing the reception strength using the distance as a variable from the reception strength repeatedly detected by the reception strength detection means and the distance repeatedly detected by the distance detection means, and a determination means which determines a height of the target from a road surface based on values of coefficients of the approximation expression. [A508]

"System and method to monitor powerlines"

The invention encompasses a system and method for monitoring a power line. In certain embodiments, a system emits a series of signals that allow for analytic analysis of a power line. for example, by taking multiple signal readings, it is possible to detect an average height reading of a power line and observe long-term trends in the time delay from signal emission to reception of an echo-signal. This allows for accurate measurement of various physical parameters of a power line, for example, the height of the power line above the ground. [A509]

"Radar apparatus"

A radar apparatus is configured to set a first target to be a non-output object with respect to a control apparatus of a host vehicle in a case where the first target (1) has a fore-and-aft distance from the host vehicle that is larger than a fore-and-aft distance from the host vehicle of a second target and (2) has a predetermined dependency to be an accessory portion which belongs to a same vehicle as the second target. The radar apparatus includes a signal processor configured to: determine whether or not the second target is present in an own lane of the host vehicle, determine whether or not the second target is changing a lane, and set the first target to be an output object with respect to the control apparatus of the host vehicle in a case where the second target is changing the lane from the own lane. [A510]

"Navigation system and method"

A navigation system and associate methods are described that include a plurality of fixed terrestrial based reference devices that calibrate the system by tracking positional error between the fixed terrestrial based reference devices. A navigation system and associated methods are also described that include a laser positioning system. A navigation system and associated methods are described that include an RF positioning system. In one example, the laser positioning system, and the RF positioning system cross check one another to ensure reliability and accuracy of a position measurement. [A511]

"High angular resolution low frequency radar with small antenna and high resolution low frequency ground penetrating radar"

A ground-penetrating radar system or other low-frequency radar system that operates at a wavelength that is comparable to or larger than the dimensions of the transmitting and receiving antennas. In one embodiment, a radar transmitter includes two drive coils, misaligned with respect to each other, that produce respective field patterns, each modulated with a respective modulation. A radar receiver includes a composite sense coil that senses the effect a target has on the fields, and generates a corresponding signal that carries the two modulations. From the proportion of the two modulations in the received signal, which depends on the extent to which the target is in each of the two field patterns, the receiver estimates the angle (e.g., the azimuth angle) to the target. An additional measurement of the angle may be made by comparing the phases of the carrier in the two received modulations. The composite sense coil may consist of two coils wired in series and configured to generate no output when the only field incident on the composite sense coil is that of the two drive coils, in the absence of a target. [A512]

"Method and device for detecting structures in an object under investigation"

A method for detecting structures (41, 42) such as edges and material transitions on and/or in an object (40) under investigation has an antenna arrangement which transmits microwave signals and registers the signals reflected from the object (40) under investigation in magnitude and phase. A three-dimensional image of the object (40) under investigation is reconstructed at sampling points of the object under investigation from the latter. It operates with the method steps: determination of a spatial position of a structure (41, 42) from the magnitude of the reflected signal, determination of the sign of the reflection coefficient of the reflected signal at the spatial position of the structure (41, 42) , and identification of structures (41, 42) on the basis of the spatial arrangement of the sign of the reflection coefficient. [A513]

"Apparatus and method for determining a vehicle feature"

Techniques are disclosed for determining characteristic feature (s) of a vehicle travelling on a roadway, comprising: a detector, which is directed towards the roadway and is configured to measure the movement vector of the vehicle at a current location and time, a tracking unit, connected to the detector, for calculating a target location of the vehicle at a target time on the basis of current location and time and movement vector, a first radar sensor, connected to the detector, for transmitting a radar beam directed towards the current location, receiving a reflected radar beam, and determining a frequency spectrum thereof, a second radar sensor, connected to the tracking unit, for transmitting a radar beam directed towards the target location at the target time, receiving a reflected radar beam and determining a frequency spectrum thereof, and an evaluation unit for generating characteristic feature (s) of the vehicle from the determined frequency spectra. [A514]

"Vehicle body front structure"

A vehicle body front structure comprises a radar bracket disposed between a bumper member and a hood lock member. The radar bracket includes an upright portion to which a radar unit is fixed and oblique portions that are continuous with an upper end of the upright portion and extend toward a vehicle rear side and upward, and a space is formed under the oblique portions on a rear side with respect to the upright portion. At a boundary between the upright portion and the oblique portions, first deformation portions are formed that facilitate deformation at this boundary, and at attachment positions of the oblique portions at which the oblique portions are attached to the hood lock member, second deformation portions are formed that facilitate deformation at these attachment positions. [A515]

"Systems and methods for inferring localized hail intensity"

The present invention is directed to system and method of processing meteorological data. The process comprises receiving a meteorological data corresponding to a geographic region from at least one meteorological data source for a selected time slice, with the meteorological data including radar reflectivity data. The system processes the meteorological data to derive probability of severe hail for points within the geographic region, processes the meteorological data to derive vertically integrated liquid for the points within the geographic region, and processes the meteorological data to derive enhanced echo tops for the points within the geographic region. The system processes the vertically integrated liquid and the enhanced echo tops to derive vertically integrated liquid density for the points within the geographic region and processes the probability of severe hail and the vertically integrated liquid density to derive derived hail index numbers for the points within the geographic region. The system generate data packets of the derived hail index numbers, with each of the derived hail index numbers corresponding to a local geographic point. [A516]

"Method for observing and recording the identity, position and movement of one or more vessels in specific waters or sailing line"

A method to automatically and continuously provide surveillance based on central and/or distributed surveillance of presence, positions, movements and movement pattern of one or more vessels in narrow waters, a sailing lane or where danger of collision with other vessels or other fixed or floating objects may occur. A vessel emits a sweeping signal that repeatedly hits one or more detectors, which detect the character of the sweeping signal and the time intervals between the signal hits on the respective detector. The exact position of the vessel and/or movements is calculated at least on the basis of trigonometric principles, and the vessel identity is produced by using signal analysis to extract the characteristic signal sequences from the received detection signals, which are related to the transmitted radar signal (s) from the vessel (s) . [A517]

"Method for determining at least one parameter for the purpose of correlating two objects"

A method for determining at least one parameter for the purpose of correlating two objects (10, 20) , particularly the distance (r) and/or the relative speed (v) of the two objects (10, 20) . A plurality of transmission pulse sequences following one after the after, each with at least one transmission pulse of an electromagnetic signal, forms a series of transmission pulse sequences. The duration of transmission of the individual transmission pulses is varied from transmission pulse sequence to transmission pulse sequence in order to reduce the susceptibility to interference in the determination of the at least one parameter. [A518]

"Apparatus for measuring the position of a vehicle or a surface thereof"

An apparatus is disclosed for measuring the position of a vehicle or a surface thereof on a roadway. The apparatus comprises at least one radar transmitter, which is arranged in a transmitting position above the plane of the roadway and transmits radar beams downwardly, a plurality of radar receivers, which are distributed above the plane of the roadway in different receiving positions at distances from one another, receive reflections of the radar beams from beneath, and convert the reflections into a received signal, and an evaluation device, which is connected to the radar transmitter and the radar receivers and is configured to measure the said position from the transmitting position, the receiving positions and the received signals. [A519]

"Sensor for detecting parking lot"

A sensor for detecting a parking space includes a modulating module for supplying a sinusoid wave having a modulation frequency, an active antenna module transmits a FMCW signal based on the modulation frequency and for receiving a reflected FMCW signal, a intermediate-frequency filter for extracting a first demodulating signal having the modulation frequency from the reflected FMCW signal generating modulation signal, a second intermediate-frequency filter for extracting a second demodulating signal having a multiplying frequency of the modulation frequency, an integrator for performing integral operation for the second demodulating signal to generate an integral voltage, a triggering circuit for generating a triggering voltage when the integral voltage is greater than a reference voltage, and a controller for performing operations relating to an existence of a vehicle when receiving the triggering voltage. [A520]

"Positioning using observer-based time-of-arrival measurements"

Disclosed are implementations that include a method, performed by a network control device, including sending a first instruction to a first device to send a first measurement signal, and sending a second instruction to a second device to receive the first measurement signal. Following receipt of a first acknowledgement signal from the target mobile device, the first and second devices change their roles so the second device sends, and the first device receives, a second measurement signal, and the first and second devices receive a second acknowledgement signal from the target device. Position of the target device is determined based on timing measurements associated with the first and second measurement signals, the first and second acknowledgement signals, and on known positions of the first and second devices. Another network device is selected to perform additional measurements upon a determination that a desired accuracy of the position determined was not achieved. [A521]

"System and method for damage tracking and monitoring during ground handling of aircraft"

A system for damage tracking and monitoring during ground handling of aircraft includes a ground service communication network configured to transmit communication data between ground support equipment, GSE, and aircraft, a database configured to store configuration data and status data of GSE and aircraft, and a computer-based system configured to communicate with the ground service communication network and the database. The computer-based system is configured to update the configuration data and the status data of GSE and aircraft stored in the database on basis of communication data received from the ground service communication network. The computer-based system is further configured to estimate a damage source among the GSE for a damage inflicted on the aircraft by one of the GSE by correlating damage characteristics of the damage with the configuration data and the status data from the database. [A522]

"System and method for detecting environment-induced disablement of advanced driver assistance system"

The present invention discloses a system and method for detecting environment-induced disablement of ADAS. The system comprises a rainfall detector, a fog detector and a temperature/humidity detector respectively generating a rainfall value, a fog value, and a temperature/humidity value, a processor electrically connected with these detectors, using the rainfall value and fog value to generate a rainfall-fog value, using the fog value and temperature/humidity value to generate a snowfall value, using a fuzzy computation to process the rainfall-fog value and snowfall value to generate an output value, and emitting an alert signal if the output value exceeds a preset output value, and an automatic driver assistance device electrically connected with the processor, receiving the alert signal, and determining whether to stop automatic driving according to the alert signal. The present invention will alerts ADAS of the disablement lest ADAS execute wrong control actions. [A523]

"Rear side obstacle display method and apparatus of vehicle"

Disclosed is a method of displaying a rear side obstacle of a vehicle, including: a first measuring step of measuring a first distance between a vehicle and an obstacle using a first sensor, a determining step of determining a position of the obstacle using the first distance, a moving distance of the vehicle, and a steering angle of the vehicle related with the moving distance, and a displaying step of displaying the position of the obstacle. Therefore, the position of the obstacle at the rear side of the vehicle is precisely predicted so that a driver may be notified in advance that the vehicle may hit the obstacle. [A524]

"Failure conditions for fine timing measurement (FTM) protocol"

Techniques for positioning with Fine Timing Measurement (FTM) messages are disclosed. An example of a wireless transceiver system for providing a FTM response message is configure to receive a FTM request from an initiating station, the FTM request may include a minimum delta FTM value, a number of bursts exponents value, and a As Soon As Possible (ASAP) value. The transceiver may send a first FTM response message indicating the FTM session is terminated if the wireless transceiver is incapable of meeting the minimum delta FTM value and the number of bursts exponents value, and send a second FTM response message including a status value based on the ASAP value in the FTM request if the wireless transceiver is capable of meeting the minimum delta FTM value and the number of bursts exponents value. [A525]

"Radar sensing of vehicle occupancy"

A method for sensing occupancy status within an automotive vehicle uses a radar sensor system, the radar sensor system includes an antenna system, at least one sensor and processing circuitry. The method comprises illuminating, using the antenna system, at least one occupiable position within the vehicle with continuous wave (CW signals) , the CW signals being frequency modulated in time. At least one sensor signal (y (t,f.sub.1 . . . y (t,f.sub.n)) reflected as a result of the CW signals, is received using at least one sensor the at least one sensor defining a plurality of receive channels (1 . . . i) , each channel having a different frequency (f.sub.1 . . . f.sub.i) . Processing circuitry is operable for applying, for each receive channel (1 . . . i) , DC offset removal to the corresponding sensor signal (y (t,f.sub.1 . . . y (t,f.sub.n)) to generate a modified signal (y' (t, f.sub.1) . . . y' (t,f.sub.n)) , and generating, based on the modified signals (y' (t, f.sub.1) . . . y' (t,f.sub.n)) one or more occupancy status signals, the occupancy status signal indicating a property related to said at least one occupiable position. [A526]

"Method for assisting a driver in driving a vehicle, a driver assistance system, a computer software program product and vehicle"

The invention regards to a method for assisting a driver in driving a vehicle, comprising the steps of producing sensor data by at least one sensor physically sensing the environment of a host vehicle and/or obtaining data conveying information about the environment of a host vehicle, generating a plurality of representation segments each segment being a portion of an entire area of representation of the environment of the host vehicle at a particular point in time wherein a relative position of the portion of such representation segment with respect to a current position of the host vehicle corresponds to a possible position of the host vehicle at that particular point in time, combining the representation segments to a spatio-temporal representation of the environment of the host vehicle, evaluating the spatio-temporal representation and outputting an assistance signal on the basis of an evaluation result. [A527]

"Method and device for providing a signal for a light control unit"

A method for providing a signal to a light control unit of at least one headlight of a vehicle that has a camera for acquiring a surrounding environment of a vehicle, the method including a step of determination of an interval between the vehicle and another vehicle using the camera. The method further includes a step of determination of a distance between the vehicle and the other vehicle using a camera-independent sensor. In addition, the method includes a step of plausibilization of the interval using the distance, the interval being plausibilized if a difference between the interval and the distance is smaller than a tolerance value. Finally, the method includes a step of provision the interval via an interface to a light control unit of the headlight. [A528]

"Receiver-transmitter"

A receiver-transmitter includes active two-face phased arrays comprising transmit-receive modules. Each module includes two radiating elements, a transmitter, two receivers, two isolator switches, mixers and a phase shifter. The two-face phased arrays are either unidimensional or two-dimensional. The arrays are arranged in the horizontal plane at an angle of 75-105.degree. to each other while keeping the capability of all-around looking. The transmit-receive module is provided with an additional phase shifter. Each phase shifter can be permanently connected, via a selector switch, to one of the receivers or to the transmitter, and the transmitter is connected, via a switch and circulators, to the radiating elements. Alternatively, each phase shifter can be connected to the radiating elements with the use of different frequencies and/or with the use of a different signal coding, corresponding to different frequencies and coding of the receivers receiving mode. [A529]

"Display and control of time evolved conditions relative to a vehicle"

Methods and systems for identifying and displaying potentially hazardous segments on a planned route of a vehicle are disclosed. A method may include: predicting a movement of a condition of concern, analyzing the movement of the condition of concern and a movement of a vehicle traveling along a planned route to generate a projection of the condition of concern onto the planned route, wherein the projection indicates conditions the vehicle is predicted to encounter at a plurality of positions along the planned route, determining whether a portion of the planned route is potentially hazardous based on the projection of the condition of concern, and visually identifying the portion of the planned route that is potentially hazardous to a user. The method may also be utilized to facilitate a reroute process. [A530]

"Systems and methods for semi-autonomous vehicular convoys"

The present invention relates to systems and methods for vehicles to safely closely follow one another through partial automation. Following closely behind another vehicle has significant fuel savings benefits, but is unsafe when done manually by the driver. On the opposite end of the spectrum, fully autonomous solutions require inordinate amounts of technology, and a level of robustness that is currently not cost effective. [A531]

"Navigation based on radar-cued visual imaging"

A navigation system for a vehicle may include at least one image capture device configured to acquire a plurality of images of an environment of a vehicle and a radar sensor to detect an object in the environment of the vehicle and to provide and output including range information indicative of at least one of a range or range rate between the vehicle and the object. The system may also include at least one processing device programmed to: receive the plurality of images from the at least one image capture device, receive the output from the radar sensor, determine, for each of a plurality of image segments in a first image, from among the plurality of images, and corresponding image segments in a second image, from among the plurality of images, an indicator of optical flow, use range information determined based on the output of the radar sensor together with the indicators of optical flow determined for each of the plurality of image segments in the first image and the corresponding image segments in the second image to calculate for each of a plurality of imaged regions at least one value indicative of a focus of expansion, identify a target object region, including at least a subset of the plurality of imaged regions that share a substantially similar focus of expansion, and cause a system response based on the identified target object region. [A532]

"Method for evaluating obstacles in a driver assistance system for motor vehicles"

A method for evaluating obstacles based on locating data of a radar sensor in a driver assistance system for motor vehicles, in which at least one evaluation function is calculated which indicates, as a function of a set of measured variables which are related to a potential obstacle, whether the potential obstacle is to be evaluated as a real obstacle, a complexity indicator being formed based on the locating data which indicates the complexity of a present measurement situation, and at least two different evaluation functions being defined for the same set of measured variables, and it being decided which of the evaluation functions is applied in the present measurement situation as a function of the complexity indicator. [A533]

"Lane estimation apparatus and method"

Disclosed herein are a lane estimation apparatus and method. The lane estimation apparatus includes a camera unit which captures an image in front of a vehicle, a radar unit which senses a plurality of stationary objects in front of the vehicle, and a lane estimation unit which detects a lane through the image captured by the camera unit, generates an imaginary lane joining a plurality of stationary objects next to a road among the stationary objects sensed by the radar unit, determines whether the generated imaginary lane is valid based on a distance between the detected lane and the generated imaginary lane, generates, when the imaginary lane is valid according to the determined result, a final lane based on the detected lane and the imaginary lane, and recognizes the generated final lane as a driving lane of the vehicle. [A534]

"Object classification for vehicle radar systems"

Methods and systems are provided for object classification for a radar system of a vehicle. The radar system includes a transmitter that transmits radar signals and a receiver that receives return radar signals after the transmitted radar signals are deflected from an object proximate the vehicle. A processor is coupled the receiver, and is configured to: obtain spectrogram data from a plurality of spectrograms pertaining to the object based on the received radar signals, aggregate the spectrogram data from each of the plurality of spectrograms into a computer vision model, and classify the object based on the aggregation of the spectrogram data from each of the plurality of spectrograms into the computer vision model. [A535]

"System and method for indicating potential wind shear events"

An aircraft weather radar system can include an electronic display, a radar antenna for receiving radar returns, and an electronic processor. The electronic processor can be configured to determine an existence of potential wind shear activity using the radar returns and cause the electronic display to provide an indication of the potential wind shear activity. The potential wind shear activity is different than a wind shear condition associated with a predictive wind shear icon for a wind shear event. [A536]

"Handheld locating device"

A locating device disposable on a surface has a housing, a capacitance sensor, a radar sensor, and an inductance sensor. The locating device also has a motion sensor disposed for detecting at least one motion parameter. A controller receives data from the capacitance sensor, the radar sensor, the inductance sensor and the motion sensor, and determines from the data a presence of objects disposed within or behind the surface. A display is used for displaying a graphical representation of the objects disposed within or behind the surface. [A537]

"Method for distance measurement between moving objects"

A method, device, system and use for determining a distance, location and/or orientation including the at least relative determination of a position of at least one object using at least two active anchors. A first signal is emitted by a first of the two anchors and is received at the object and by a second of said two anchors. A phase measurement is performed at said second anchor and wherein a distance determination with respect to said first anchor is performed and/or the distance from said first anchor to said second anchor is known. A second, particularly electromagnetic, signal is emitted from said second anchor, and information on phase measurement and distance between said first and second anchors is made available to a computation unit and at least one phase measurement respectively of said first and second signal is performed at said object and made available to said computation unit. [A538]

"Radar level gauge inclination system"

A radar level gauge arrangement for determining the fill level of a filling material in a tank is disclosed, which arrangement is mounted on a hatch of a tank and/or on a support which is adapted to be mounted on a hatch of a tank. The arrangement comprises a transmitter for transmitting measuring signals at least along a first axis for determining the fill level of the tank, a receiver for receiving echo signals corresponding to the distance to the surface, a first processing circuitry for receiving the echo signals and to determine a fill level of the tank based on the echo signal, an inclinometer attached to the support and adapted to generate an inclination output corresponding to the inclination relative the surface normal, a second processing circuitry for generating, based on the inclination output, an angular output when there is an angular difference between the first axis and the surface normal. The arrangement also comprises a presenter for communicating information about the angular difference externally of said system, or a communication path for communicating the angular output to said first processing circuitry. [A539]

"Driver assist system for vehicle"

A vehicular driver assist system suitable for use in a vehicle includes a video processor module receiving and processing image data provided by a plurality of video sensors and sensor data provided by a plurality of non-video sensors. The video processor module communicates with other vehicle systems via a vehicle bus. The received image data may be processed at the video processor module to generate a synthesized image, which may be output from the video processor module for display by a single display screen of a display device that is viewable by a driver of the vehicle. An object external to the vehicle may be detected, at least in part, via processing of image data at the video processor module. Responsive at least in part to processing of image data and sensor data at the video processor module, a driver assistance system of the vehicle is controlled. [A540]

"Wearable pedestrian safety radar system"

A wearable pedestrian safety radar system including a harness with a pocket and a portable radar speed detection and display device to be worn on the front and back of the harness by a pedestrian while on a roadway. The device includes a radar system, LED lights, a microcontroller, a proximity sensor, a camera, a strobe light, an audible alert unit and a vibration unit. The device detects a speed of an on-coming motor vehicle. If the vehicle is exceeding a predetermined speed limit, the speed is displayed on the device. If the vehicle does not slow down below the speed limit within a distance detected by the proximity sensor, the camera records the vehicle while the strobe light blinks to warn the driver of the recording. The audible alert unit and vibration unit alert the pedestrian. The system may be used to relay data to a law enforcement agency. [A541]

"Structure and technique for antenna decoupling in a vehicle mounted sensor"

Presently disclosed is a structure and technique for de-coupling a sensor (such as an automotive radar sensor) , from a surrounding electrically conductive structure (such as a vehicle) on which the sensor is mounted. [A542]

"Ice analysis based on active and passive radar images"

An ice analyzer includes processing circuitry configured to receive a radiometer image including a geographic area including ice, receive a radar image including at least a portion of the geographic area, perform ice/water discrimination of the radiometer image and the radar image, generate a passive ice/water mask and an active ice/water mask based on the ice/water discrimination, merge the passive ice/water mask and the active ice/water mask into a typing mask, and type the ice based on the typing mask. [A543]

"Methods and systems for determining vehicle position in an automatic vehicle identification system"

Methods of estimating vehicle location in a roadway using an automatic vehicle identification system are described. The methods involve receiving a set of response signals from a vehicle-mounted transponder at points in time and determining a range rate of the transponder relative to the antenna at each point in time, identifying a minima in the magnitude of the range rate, estimating a first position of the transponder at a first time corresponding to the occurrence of the minima, estimating a velocity of the vehicle based upon one or more of the determined range rates, and estimating a second position of the transponder based upon the first position and the velocity. [A544]

"Radar surveillance system"

A radar surveillance system is described in which the radar beam re-visits each area of interest after a short period of time, by electronically reconfiguring a scanned beam to an offset position for an interleaved sub-dwell, within a scan period. This `look-back` capability, where the area under test is re-visited after approximately 1 second, allows the natural de-correlation of sea clutter to take place between the initial and look-back samples of the surveillance area. The re-visit time can be adjusted to best exploit the de-correlation characteristics of the sea clutter return. [A545]

"Furniture and building structures comprising sensors for determining the position of one or more objects"

A system, device and method for determining the position of objects comprising one or more furniture items and/or building structures having one or more sensors and a controller coupled to the sensors. The sensors detect when one or more objects having at least one sensor tag are positioned proximate one of the sensors and transmit a signal to the controller including an identifier of the object and the sensor that detected the objects. As a result, the controller is able to track the position of the objects in relation to the furniture and/or building structures preventing the items from being lost and increasing efficiency when looking for misplaced objects. [A546]

"Device for remote non-contact monitoring of vital signs of a living being"

The present disclosure relates to a device for remote non-contact monitoring of vital signs of a living being. The present disclosure enables improved measurement accuracy and reliability, increased operating range and reduced likelihood of mistakenly detecting extraneous objects. The device comprises at least one measuring unit, at least one control and data processing unit, and at least one interface unit, connected to each other. The measuring unit comprises a radio transmitting module and a radio receiving module. The control and data processing unit is configured to generate control pulses for each of the radio transmitting and radio receiving modules delayed for arbitrary time periods between each other, and is additionally configured to generate control pulses of arbitrary duration for each of the radio transmitting and radio receiving modules. Each radio transmitting module and/or each radio receiving module contained in the measuring unit is made independent of the other modules. [A547]

"Signal processor"

A signal processor includes an amplifier that amplifies a control signal which is input into the amplifier to output an amplified control signal, and a controller that performs predetermined control based on the amplified control signal. When the control signal is not input into the amplifier, the amplifier amplifies a voltage signal input from a power source for driving the amplifier. [A548]

"Flexible artificial impedance surface antennas for automotive radar sensors"

A flexible, printable antenna for automotive radar. The antenna can be printed onto a thin, flexible substrate, and thus can be bent to conform to a vehicle body surface with compound curvature. The antenna can be mounted to the interior of a body surface such as a bumper fascia, where it cannot be seen but can transmit radar signals afield. The antenna can also be mounted to and blended into the exterior of an inconspicuous body surface, or can be made transparent and mounted to the interior or exterior of a glass surface. The antenna includes an artificial impedance surface which is tailored based on the three-dimensional shape of the surface to which the antenna is mounted and the desired radar wave pattern. The antenna can be used for automotive collision avoidance applications using 22-29 GHz or 76-81 GHz radar, and has a large aperture to support high angular resolution of radar data. [A549]

"Wave dielectric transmission device, manufacturing method thereof, and in-millimeter wave dielectric transmission method"

A millimeter wave transmission device, the millimeter wave transmission device having (a) a first signal processing board for processing a millimeter wave signal, (b) a second signal processing board signal-coupled to the first signal processing board to receive the millimeter wave signal and perform signal processing with respect to the millimeter wave signal, and (c) a viscoelastic member provided between the first signal processing board and the second signal processing board and having a predetermined relative dielectric constant and a predetermined dielectric dissipation factor. The member constitutes a dielectric transmission path via which the millimeter wave signal is transmitted between the first signal processing board and the signal processing board. [A550]

"Multi-slice two-dimensional phased array assembly"

A two-dimensional phased array beam former comprising at least first and second chips having each top and bottom surfaces, the bottom surface of the first chip being attached to the top surface of the second chip, the first and second chips having each an emitter side surface, the emitter side surfaces of the first and second chips facing a same direction and comprising each a plurality of emitters, wherein each of said first and second chips comprises at least one conductive post extending between said top and bottom surfaces, the at least one conductive post of the first chip being vertically aligned with and connected to the at least one conductive post of the second chip. [A551]

"Fail operational vehicle speed estimation through data fusion of 6-DOF IMU, GPS, and radar"

A method for providing redundant vehicle speed estimation. The method includes providing sensor output signals from a plurality of primary sensors and providing inertial measurement signals from an inertial measurement unit. The method also includes estimating the vehicle speed in a primary module using the primary sensor signals, and buffering the estimated vehicle speed values from the primary module for a predetermined period of time. The method further includes determining that one or more of the primary sensors or the primary module has failed, and if so, estimating the vehicle speed in a secondary module using the method can use GPS signal data and/or range data from static objects to improve the estimated vehicle speed in the secondary module if they are available. [A552]

"Registered multi-layer underground and surface images in land surveys"

A method of land surveying that electronically registers together multi-layer underground and surface images of a surface volume with buried utilities and other infrastructures. Such method further comprises assembling and presenting the combination to a device in the field that visually guides crews in their safe digging of the ground nearby. The orienting, scaling, and registering of a first image layer is to a standardized orientation and scaling on a map of a photograph of a land surface from a zenith point in space above. Then the orienting, scaling, and registering of a second image layer is made to the standardized orientation and scaling on the map. This layer is a result of a ground penetrating radar investigation of buried objects point-by-point in an immediate search area of a corresponding ground surface. Underground buried objects and utilities are thereby located to make safe digging nearby. [A553]

"Radar system and methods"

A radar system. The radar system may include a housing having a base for mounting on a marine vessel. The radar system may include a radar disposed inside the housing. The radar system may include an antenna coupled to the radar. The radar system may also include a lighting system having a light source, and where a portion of the lighting system is disposed inside the housing. The radar system may include a controller coupled to the lighting system. [A554]

"Collision avoidance assist device and collision avoidance assist method"

A collision avoidance assist device that performs an assist for avoiding a collision between a vehicle and an object includes an object detection unit that detects the object around the vehicle, a time calculation unit that calculates a time to collision between the vehicle and the object based on the detection result of the object detection unit, and an assist control unit that suppresses a release of a braking for avoidance assist as the time to collision decreases when an execution of the collision avoidance assist is controlled based on the time to collision. [A555]

"Radar device for a motor vehicle, securing device for a radar apparatus and method for manufacturing an absorption element for a radar apparatus"

The invention relates to a radar device (1) for a motor vehicle, having a radar apparatus (2) for emitting and receiving electromagnetic waves (4) and having at least one absorption element (9, 100) , which is formed from an absorption material which absorbs the electromagnetic waves (4) , wherein the at least one absorption element (9, 100) is embodied as an element which is separate from a housing (3) of the radar apparatus (2) and is arranged outside the housing (3) , in particular on the housing (3) . [A556]

"Radar sensor for motor vehicles"

A radar sensor for motor vehicles, having a transmitting antenna in the form of a planar group antenna having multiple antenna elements situated side by side on a shared planar substrate, and having a feed network and a switching device for supplying microwave power to the antenna elements. The antenna elements are situated at equal distances in at least one row, the feed network is designed for supplying the antenna elements with the microwave power having a phase shift which increases at constant increments from one end of the row to the other, and the switching device is designed for controlling the supply of the microwave power to the antenna elements in such a way that, depending on the operating mode, the supply is implemented in a mirror-inverted fashion from opposite ends of the at least one row. [A557]

"Virtual antenna extension for sampled aperture arrays"

A high frequency surface wave radar (HFSWR) system with improved performance. Two or more transmitters including separate transmitting antennas (120, 122, 410) are used to improve the performance of the HFSWR over the performance of a comparable system with a single transmitter. In one embodiment, two transmitters are used, and configured to transmit pulses alternately, with a time interval of at least a round-trip travel time corresponding to a maximum target range between any pair of transmitted pulses. A physical receiving antenna array (130) includes a plurality of receiving antenna elements (135) , and is connected to receiver circuitry configured to distinguish returns corresponding to pulses emitted by the different transmitters. The returns are concatenated in the receiver circuitry to achieve improved resolution. [A558]

"Control system"

The invention relates to a control system for driving a motorized closure element of a motor vehicle, wherein a control arrangement and at least one distance sensor are provided in order to detect operator control events, wherein a distance from a user can be detected by means of the distance sensor. The invention proposes that the distance sensor has a changing sensitivity along a sensor extent, and in that a longitudinal movement by the user along the sensor extent produces a pattern in the profile of the sensor signal with respect to time, which pattern is detected by the control arrangement at least as part of an operator control event, owing to the sensitivity profile along the sensor extent. [A559]

"Method and apparatus for battery operated radio tags"

An apparatus, method and computer program are disclosed in which a radio unit (110) of a mobile station (100) is caused to periodically communicate with a radio tag (200) with a first period between subsequent communications and to perform pairing with the radio tag (200) . Storing of pairing information relating to the paired radio tag (200) is caused. A first profile associated with the mobile station (100) is maintained. A second profile associated with the paired radio tag (200) is maintained. Adapting of the first period is performed based on at least one of: the first profile and the second profile. [A560]

"Method and device for warning against cross traffic when leaving a parking space"

A method for warning the driver of a vehicle against cross traffic when leaving a parking space, wherein the motor vehicle has far-field sensors at least in the region of the rear-end corners for detecting possible cross traffic and lateral near-field sensors for detecting the near surroundings of the vehicle and wherein the warning is generated if at least one of the far-field sensors detects cross traffic. The method surveys the nearby lateral surroundings of the driver's vehicle while leaving the parking space, determines from the results of the near-field detection whether the far-field sensors have a free view of the cross traffic, and generates a notification to the driver if one or both far-field sensors do not have a free view of the cross traffic. [A561]

"Apparatus, system and method of estimating a location of a mobile device"

Some demonstrative embodiments include devices, systems and/or methods of estimating a location of a mobile device. for example, an apparatus may include a wireless communication unit to communicate Time of Flight (ToF) accuracy information corresponding to a location area. The ToF accuracy information may include at least one accuracy indicator corresponding to at least one wireless communication device. The accuracy indicator may indicate an accuracy of a ToF measurement at the location area with the wireless communication device. [A562]

"Systems and methods for managing restricted areas for unmanned autonomous vehicles"

Methods, systems, and devices for providing data from a server to a UAV enable the UAV to navigate with respect to areas of restricted air space ("restricted areas") . A server may receive from a UAV, a request for restricted area information based on a position of the UAV. The server may determine boundaries of a surrounding area containing the position of the UAV and a number of restricted areas. The server may transmit coordinate information to the UAV defining the restricted areas contained within the surrounding area. [A563]

"Object detection device"

An object detection device can acquire information of an object in the vicinity of a host-vehicle for appropriate traveling assistance. An object detection device 1 includes a vehicle state detection section 2, an environmental situation acquisition section 3, a road information acquisition section 4, a detection control section 6, and a detection section 7. A host-vehicle state prediction section 61 acquires a target state of a host-vehicle 81. The detection section 7 detects an object. A parameter setting section 63 switches the detection characteristic of the object in the detection section 7 in accordance with the target state. [A564]

"System and method for avoiding obstacle for autonomous vehicle"

A system and method of avoiding an obstacle for an autonomous vehicle is provided. The system includes an valid trajectory generation unit configured to generate a circle in which the vehicle is located in a center position of a circle, calculate a rotatable range of the vehicle, and generate an valid trajectory estimated that the vehicle passes based on the generated circle and rotatable range, an obstacle detection unit configured to detect the obstacle located in front of the vehicle, and a driving path control unit configured to control a driving path of the vehicle when a position of the detected obstacle is included within the generated valid trajectory. [A565]

"Personal electronic target vision system, device and method"

A personal, electronic target vision system renders targets in the field of view of the user in real-time so that the user can visualize where the targets are relative to him, in an orientation analogous to unaided human vision. An electronic vision device exchanges target selection information with a target vision server which returns to the electronic vision device the corresponding selected target location information for rendering selected targets in accordance with the user's changing viewpoint. The target vision server queries a target information server in order to access, filter and provide the real-time target location information required by the electronic vision device. A surveillance system of sensors and target tracking systems provides the target information server with target location information. [A566]

"Interference suppression in blind spot monitoring"

A device for detecting a moving object in a blind spot includes: at least one first ultrasonic sensor of a side view assist system, and a control unit for determining the distance and/or speed and/or position of the moving object. The control unit processes at least one signal of a second ultrasonic sensor of a driving assistance system for monitoring the blind spot. [A567]

"Vehicle intersection monitoring system and method"

A vehicle intersection monitoring method includes exchanging host vehicle information and remote vehicle information between a host vehicle and a remote vehicle, identifying a road intersection based on at least one of the host vehicle information and the remote vehicle information, and selecting an intersection scenario from a plurality of intersection scenarios based on the host vehicle information and the remote vehicle information. The method further includes monitoring, by operation of a processor, a location relationship between the host vehicle and the remote vehicle according to an algorithm that is determined based on the selected intersection scenario, to determine whether a possibility of contact between the host vehicle and the remote vehicle exists proximate to the intersection, and performing a threat mitigation operation while the possibility of contact exists. [A568]

"Adaptive response time acceleration"

This document discusses among other things, methods and apparatus to conserve energy when providing proximity information. An example apparatus can include an energy emitter configured to emit a first pulse of energy, an energy sensor configured to receive reflected energy from the first pulse of energy, a control circuit including a processor, the processor configured to provide first proximity information of the apparatus with respect to an object using the reflected energy. The control circuit can be configured to control the energy emitter, to compare the first proximity information with second proximity information, and to modulate a delay between the first pulse of energy and a subsequent pulse of energy using the comparison. [A569]

"Obstacle detection device for vehicle"

A vehicle obstacle detection device comprises: a radar unit provided between a back surface of a bumper and a wheel and configured to detect an obstacle by transmitting a radio wave through the bumper, and a misdetection prevention member for preventing misdetection in the radar unit by suppressing the occurrence of an own-vehicle's wheel reaching wave which is a part of a transmission wave and which passes between a transmitter section of the radar unit and the back surface of the bumper and reaches the wheel of the own vehicle. [A570]

"Systems and methods for detecting soil characteristics"

A soil detection and planting apparatus. The apparatus includes a vehicle and a controller coupled to the vehicle. The apparatus further includes a planting device coupled to the vehicle, the planting device configured to plant seeds or plants into a soil material. The apparatus includes a ground penetrating radar sensor coupled to the vehicle. The ground penetrating radar soil sensor is configured to scan the soil material up to a designated depth beneath a surface of the soil material, wherein the ground penetrating radar soil sensor is further configured to provide a sensor feedback signal to the controller with respect to an intrinsic characteristic of the soil material. The controller is configured to instruct placement of a seed or a plant into the soil material based on the feedback signal. [A571]

"Target detection apparatus and vehicle control system"

A target detection apparatus counts the number of reflection points, taking a reflection point of interest as being a target reflection point, for each detected reflection point, the reflection points being present in a target area that is set with reference to the target reflection point and each having a difference in speed from the target reflection point, the difference being not more than a preset identical speed determination threshold, and extracts a parallel-running pair that is a pair of the reflection points that meet preset parallel-running conditions. The target detection apparatus determines that the two reflection points configuring the parallel-running pair originate from an identical target, when a count value is not less than a preset size determination threshold, the count value being of at least either of the two reflection points configuring the extracted parallel-running pair and generates target information reflecting the determination results. [A572]

"Hands-off steering wheel governed by pedestrian detection"

A vehicle may be steered without a driver's hands being on a vehicle steering control mechanism. A presence of an object within a predetermined distance of the vehicle may be detected using data from at least one object detection sensor that provides data to at least one of a passive safety system, a lane control system, a speed control system, and a brake control system. A steering control mechanism hands-on mode can then be enabled based at least in part on the presence of the object. [A573]

"Unwrapping and prediction of distance and velocity measurements using carrier signals"

Systems and methods for performing distance and velocity measurements, such as by using carrier signals, are disclosed. A measurement method may include transmitting a first signal from an originator device to a transponder device and determining a carrier phase of the first signal at the transponder device. The measurement method may also include transmitting a second signal from the transponder device to the originator device and determining a carrier phase of the second signal at the originator device. The measurement method may include estimating a relative distance between the originator device and the transponder device using the carrier phase of the first carrier signal, the carrier phase of the second carrier signal. The method may also include estimating the relative distance using a frequency difference. The method may include using an adjusted relative distance to determine a total distance between the originator device and the transponder device. [A574]

"System and method for determining a position of a living being in a vehicle"

A system for determining a position of a living being in a vehicle interior includes at least three components, each component of a first type or a second type, one of the first or second type being a transmitter and the other a receiver. Two components are of the first type and one component is of the second type. Each component is adapted to transmit or receive a signal dependent on type. The signal is adapted for determining a presence of the living being and for determining a distance (d.sub.1, d.sub.2) between the living being and each component of the first type. The components have active sectors adapted to at least partly overlap within the vehicle interior. The components of the first type are located at different positions known relative to each other. The system is adapted to determine the living being position based on the determined distances (d.sub.1, d.sub.2) . [A575]

"Method and device for measuring speed in a vehicle independently of the wheels"

A method for determining the speed of a vehicle is described. In this method, at least one object present in the environment of the vehicle is detected and a relative speed of the detected object in relation to the vehicle is measured. In addition, the speed of the vehicle is determined on the basis of the relative speed of the object. [A576]

"Vehicle travel control apparatus"

Provided is a vehicle travel control apparatus, mounted on a host vehicle, which performs travel control of the host vehicle on the basis of a positional relationship between the host vehicle and a preceding vehicle traveling ahead of the host vehicle, the vehicle travel control apparatus including a millimeter wave sensor that acquires target data of the preceding vehicle by receiving a reflected wave of an emitted electromagnetic wave, and an ECU that determines the presence or absence of a preceding vehicle traveling directly ahead of the host vehicle on the basis of the target data acquired by the millimeter wave sensor and that performs acceleration and deceleration control of the host vehicle on the basis of the presence or absence of the preceding vehicle. The ECU performs the acceleration and deceleration control of the host vehicle so that the acceleration or deceleration is suppressed in a case of the occurrence of target misidentification in which the millimeter wave sensor acquires a plurality of pieces of target data with respect to the same object. [A577]

"Vehicle travel assistance apparatus and vehicle travel assistance method"

A vehicle travel assistance apparatus includes a transceiver that transmits radio waves and receives reflected waves, a detector that detects a forward vehicle traveling ahead of a vehicle and a pedestrian based on intensities of the reflected waves, and a controller that, in a case the detector detects a stop state of the forward vehicle, a stop state of the vehicle and a presence of the pedestrian during the forward vehicle following, continues a stationary state of the vehicle. [A578]

"Arrangement having a trim component and a radar sensor, motor vehicle and method for manufacturing an arrangement"

An arrangement for a motor vehicle having a trim component, in particular a bumper, and a radar sensor is disclosed. In order to detect target objects, the radar sensor is designed to emit electromagnetic waves through the trim component and to receive radiation echoes from the target objects. The radar sensor has an azimuthal detection angle, by which a field of vision of the radar sensor in the azimuthal direction is defined, and is arranged at a distance from a rear side of the trim component, with the result that the azimuthal field of vision of the radar sensor intersects the trim component in an intersection region. In order to absorb interference waves outside the azimuthal detection angle an absorptive material is applied outside the intersection region in the azimuthal direction to the rear side of the trim component, where the intersection region is free of absorptive material. [A579]

"Unmanned aerial vehicle authorization and geofence envelope determination"

Methods, systems, and apparatus, including computer programs encoded on computer storage media, for unmanned aerial vehicle authorization and geofence envelope determination. One of the methods includes determining, by an electronic system in an Unmanned Aerial Vehicle (UAV) , an estimated fuel remaining in the UAV. An estimated fuel consumption of the UAV is determined. Estimated information associated with wind affecting the UAV is determined using information obtained from sensors included in the UAV. Estimated flights times remaining for a current path, and one or more alternative flight paths, are determined using the determined estimated fuel remaining, determined estimated fuel consumption, determined information associated wind, and information describing each flight path. In response to the electronic system determining that the estimated fuel remaining, after completion of the current flight path, would be below a first threshold, an alternative flight path is selected. [A580]

"Method and device for the position determination of objects by means of communication signals, and use of the device"

The invention relates to a method for the position determination of objects (62, 707,84, 96) by means of communication signals, in which a transceiver capable of wireless communication transmits communication signals, the transceiver (51) being capable of simultaneous transmission and reception, and wherein the communication signals are at least partially reflected as reflection signals on at least one object (62, 707, 84, 96) in a signal propagation zone and the transceiver (51) receives the reflection signals. The method is characterized in that phase information of the reflection signals or communication signals are determined. The invention further relates to a corresponding device and to a use of the device. [A581]

"Iterative Kalman filtering"

Several types of noise limit the performance of remote sensing systems, e.g., systems that determine the location, color, or shape of remote objects. When noise detected by sensors of the remote sensing systems is known and well estimated, a Kalman filter can converge on an accurate value without noise. However, non-Gaussian noise bursts can cause the Kalman filter to diverge from an accurate value. Current approaches arbitrarily boost noise with fixed additive or multiplicative factors, which slows filter response and often fails to give timely results. Such noise boosts prevent divergence due to badly corrupted measurements. Disclosed embodiments eliminate a subset of noise measurements having the largest errors from a data set of noise measurements and process the remaining data through the Kalman filter. Advantageously, disclosed embodiments enable a Kalman filter to converge on an accurate value without the introduction of noise boost estimates. [A582]

"Virtual input system"

For a user having a user input actuator, a virtual interface device, such as for a gaming machine, for determining actuation of a virtual input by the input actuator is disclosed. The device comprises a position sensing device for determining a location of the user input actuator and a controller coupled to the position sensing device, the controller determining whether a portion of the user input actuator is within a virtual input location in space defining the virtual input. [A583]

"Peripheral object detection apparatus and peripheral object detection method"

A peripheral object detection apparatus that is installed in a vehicle to detect a peripheral object obstructing travel by a vehicle includes: a radar that obtains a reflection intensity by transmitting an electromagnetic wave and receiving an electromagnetic wave reflected by an object, and a determination unit that calculates an integrated value of an amount of variation in the reflection intensity within a predetermined section, obtained by the radar, and determines on the basis of the integrated value whether or not the object is a low object not obstructing travel by the vehicle. [A584]

"Systems and methods for vehicle position detection"

A system includes a transmission unit, a first reception antenna, a second reception antenna, and a processing unit. The transmission unit is configured to be disposed onboard a vehicle traversing a route, includes a transmission antenna, and is configured to transmit a location signal to a target disposed along the route as the vehicle traverses the route. The first reception antenna is configured to receive at least one reflection signal of the location signal reflected off the target. The second reception antenna is configured to receive the at least one reflection signal. The processing unit is configured to obtain first reception information from the first reception antenna and second reception information from the second reception antenna, perform a comparison of the first and second reception information, and determine a position of the vehicle using the comparison of the first and second reception information. [A585]

"Method for maintaining a warning signal in a motor vehicle on the basis of the presence of a target object in a warning region, in particular a blind spot region, corresponding driver assistance system,

and motor vehicle"

A method for the output of a warning signal for warning the driver of a motor vehicle about the presence of a vehicle-external target object in a warning region, which is prescribed in relation to the motor vehicle, by means of a driver assistance system of the motor vehicle, in which a radar sensor is used to transmit electromagnetic radar signals into a sensing region of the radar sensor in each of successive measurement cycles of the radar sensor and to receive received signals, the received signals are used for detection of the target object by means of the radar sensor and for tracking said target object in the sensing region over the measurement cycles, and, if the target object enters the prescribed warning region, the warning signal is output by means of an output device. [A586]

"Detecting roadway targets across radar beams by creating a filtered comprehensive image"

The present invention extends to methods, systems, and computer program products for detecting targets across beams at roadway intersections. Embodiments of the invention include tracking a target across a plurality of beams of a multiple beam radar system in a roadway intersection and updating track files for targets within a roadway intersection. Returns from a plurality of radar beams monitoring a roadway intersection are divided into range bins. Identified energy in the range bins is used to compute the position of targets within a roadway intersection. When the position of a target is computed, it is determined if the position is a new position for an existing target or if the position is the position of a new target. [A587]

"Use of motion data in the processing of automotive radar image processing"

In an example method, a vehicle configured to operate in an autonomous mode could have a radar system used to aid in vehicle guidance. The method could include a plurality of antennas configured to transmit and receive electromagnetic signals. The method may also include a one or more sensors configured to measure a movement of the vehicle. A portion of the method may be performed by a processor configured to: i) determine adjustments based on the movement of the vehicle, ii) calculate distance and direction information for received electromagnetic signals, and iii) recover distance and direction information for received electromagnetic signals with the adjustments applied. The processor may be further configured to adjust the movement of the autonomous vehicle based on the distance and direction information with adjustments applied. [A588]

"Fusion method for cross traffic application using radars and camera"

A method and system are disclosed for tracking objects which are crossing behind a host vehicle. Target data from a vision system and two radar sensors are provided to an object detection fusion system. Salient points on the target object are identified and tracked using the vision system data. The salient vision points are associated with corresponding radar points, where the radar points provide Doppler radial velocity data. A fusion calculation is performed on the salient vision points and the radar points, yielding an accurate estimate of the velocity of the target object, including its lateral component which is difficult to obtain using radar points only or traditional vision system methods. The position and velocity of the target object are used to trigger warnings or automatic braking in a Rear Cross Traffic Avoidance (RCTA) system. [A589]

"Marine radar based on cylindrical array antennas with other applications"

An all-solid-state marine radar technology based on a non-rotating cylindrical array antenna is described. Multiple transmit and receive modules are used to form the antenna beam, which allows the beam sequencing, the dwell time in each beam position, the resolution, and the beam shape to be varied in order to make best use of the available energy. Waveforms with a high duty ratio can be used on transmit in order to make efficient use of solid-state power amplifiers. High resolution in both range and Doppler provides high measurement accuracy and superior performance in clutter. Alternate embodiments, including continuous waveform embodiments are disclosed. [A590]

"On-demand multi-scan micro doppler for vehicle"

A radar sensing system for a vehicle includes a transmitter, a receiver, a memory, and a processor. The transmitter transmits a radio signal and the receiver receives a reflected radio signal. The processor samples reflected radio signals during a plurality of time slices. The processor produces samples by correlating reflected radio signals to time-delayed replicas of transmitted radio signals. The processor accumulates the time slices into a first radar data cube and stores the first radar data cube in a memory. The processor combines a portion of the first radar data cube with a portion of a previously stored radar data cube. Based at least in part on the combined portions of the radar data cubes, the processor processes a time series that is a time series of the first radar data cube concatenated with a time series from the previously stored radar data cube. [A591]

"System and method for mobile data expansion"

A data expansion system that provides continuum of discrete wireless small cell coverage areas for mobile terminals includes a set of roadway reflectors configured to provide wireless broadband data services to a mobile terminal. Each reflector includes processing circuitry configured to establish communications between the mobile terminal and a backhaul network. Each reflector includes a wireless transceiver configured to transmit and receive data. Each reflector includes a power source that converts solar energy into electricity. Each reflector includes a housing configured to contain the processing circuitry, the transceiver, and the power source. The housing has a raised reflective surface. [A592]

"Detecting sensor degradation by actively controlling an autonomous vehicle"

Methods and systems are disclosed for determining sensor degradation by actively controlling an autonomous vehicle. Determining sensor degradation may include obtaining sensor readings from a sensor of an autonomous vehicle, and determining baseline state information from the obtained sensor readings. A movement characteristic of the autonomous vehicle, such as speed or position, may then be changed. The sensor may then obtain additional sensor readings, and second state information may be determined from these additional sensor readings. Expected state information may be determined from the baseline state information and the change in the movement characteristic of the autonomous vehicle. A comparison of the expected state information and the second state information may then be performed. Based on this comparison, a determination may be made as to whether the sensor has degraded. [A593]

"Hand-held locating appliance and a method of locating objects with the hand-held locating appliance"

A hand-held locating device for locating locatable objects includes a computational unit. The computational unit includes a first locating apparatus and at least one second locating apparatus. The first location apparatus is configured to locate a first subset of the locatable objects in a first locating region. The at least second locating apparatus is configured to locate a second subset of the locatable objects in a second locating region. The computational unit is configured to determine at least one piece of locating information for at least one locatable object of the locatable objects on the basis of a first locating result from the first locating apparatus and a second locating result from the second locating apparatus. [A594]

"Method and apparatus for capturing an image of a speed-violating vehicle"

Methods and devices are provided for recording images of vehicles that pass through a section between an entrance and an exit at excessive speed, comprising the following steps: capturing an entry time of a vehicle at the entrance, generating a unique object identifier for the vehicle and storing the entry time under the object identifier, tracking the movement of the vehicle, which is being continuously referenced by way of the object identifier, over the entire section using a sensor arrangement, capturing an exit time of the vehicle that is referenced by way of the object identifier at the exit, and if a comparison of the captured exit time to the stored entry time indicates a speed that exceeds a threshold value: determining an entry image stored under the object identifier or creating an exit image of the vehicle. [A595]

"Vehicle radar system with trailer detection"

A radar object detection system includes a radar sensor and a controller. The radar sensor is configured to emit a radar signal toward a defined area proximate to the vehicle, and output a reflection signal indicative of a detected target present in the defined area. The controller is configured to receive the reflection signal from the radar sensor, determine if the detected target corresponds to a trailer towed by the vehicle, and define an exclusion zone characterized as occupied by the trailer and thereby excluded from the defined area where objects can be detected. [A596]

"Apparatuses and methods relating to findable balls"

Golf balls for use with a system for finding golf balls and methods for making such golf balls. In the case of one exemplary golf ball, the ball includes a shell, a core material and a tag having a diode which is coupled to an antenna which has at least a portion formed from an elastic conductive material, such as an elastic conductive ink. The core material may include a void for receiving at least part of the diode. Other golf balls are described and methods for making balls are also described. [A597]

"Preceding vehicle selection apparatus"

A preceding vehicle selection apparatus estimates a curvature of a road on which an own vehicle is traveling, detects an object ahead of the own vehicle, and determines a relative position in relation to the own vehicle. Based on the curvature and the relative position, an own vehicle lane probability instantaneous value is determined. This instantaneous value is a probability of the object ahead being present in the same vehicle lane as the own vehicle. By a filter calculation on the instantaneous value, an own vehicle lane probability is determined. Based on the own vehicle lane probability, a preceding vehicle is selected. An inter-vehicle time required for the own vehicle to reach a detection position of the object ahead is calculated. Based on the inter-vehicle time, characteristics of the filter calculation are changed such that an effect of the own vehicle lane instantaneous value increases as the inter-vehicle time decreases. [A598]

"Waste water assessment"

Waste water assessment apparatus, a method and a computer program are provided. The waste water assessment apparatus comprises: transceiver circuitry configured to transmit a microwave signal and to receive one or more reflections of the microwave signal, and processing circuitry configured to process the one or more reflections of the microwave signal to determine one or more characteristics of waste water flowing through a conduit. [A599]

"Measuring whispering-gallery-mode resonator"

A measuring whispering-gallery-mode resonator includes: a dielectric resonating body with a rotation axis, a superconducting sample under test mounted to the resonating body and a coupling unit for coupling a measuring waveguide with the resonating body. One side of the resonating body connected with the coupling unit has a first endplate, in which m coupling holes penetrate through the first endplate, and centers of the m coupling holes are arranged to be evenly spaced along a circle whose center is on the rotation axis. The coupling unit has a feeder line which is a coaxial waveguide, and an axis of the coaxial waveguide coincides with the rotation axis. One end surface of the coaxial waveguide, which is perpendicular to the rotation axis, abuts the first endplate, and the azimuth index of operated whispering gallery mode in the resonator is an integer multiple of the number m of the coupling holes. [A600]

"Modifying adaptive cruise control to mitigate rear-end collisions"

Methods and systems for controlling a host vehicle to mitigate rear-end collisions. One method includes automatically maintaining the host vehicle at least a predetermined following distance from a front vehicle traveling ahead of the host vehicle. The method also includes detecting a rear vehicle traveling behind the host vehicle and determining when the rear vehicle poses a rear-end collision risk with the host vehicle. In addition, the method includes automatically, by a controller, increasing a speed of the host vehicle when the rear vehicle poses a rear-end collision risk with the host vehicle, and automatically reducing the predetermined following distance to decrease a distance between the host vehicle and the front vehicle and increase a distance between the host vehicle and the rear vehicle when the rear vehicle poses a rear-end collision risk with the host vehicle. [A601]

"System for determining position in a work space"

A system for determining the dimensional coordinates of a point of interest in a work space, includes a plurality of fixed-position ranging radios, located at known positions in the work space, and a wand having a first end configured for indicating a point of interest. A pair of ranging radios are mounted on the wand. A measurement circuit, responsive to the pair of ranging radios, determines the position of each of the pair of ranging radios with respect to the plurality of fixed-position ranging radios, and determines the position of the first end of the wand with respect to the plurality of fixed position ranging radios. A robotic total station may be used in lieu of the fixed-position ranging radios to monitor the positions of retroreflective elements on the wand. [A602]

"Circuit arrangement"

A circuit arrangement for converting from a differential signal path (IF.sub.outA - IF.sub.outB) at the output of a mixer to a signal path (S.sub.sin gle) referenced to a reference potential. A controllable switch element is provided in each of the two single signal paths (IF.sub.outA, IF.sub.outB) of the differential signal path (IF.sub.outA-IF.sub.outB) , wherein a first memory element is connected in series with the two switch elements, and wherein there is provided for the two switch elements at least one control, which during a charging phase of the first memory element connects the differential signal path (IF.sub.outA-IF.sub.outB) at the output of the mixer with the first memory element and applies the output signal on the differential output of the mixer for charging the first memory element. During the discharging, respectively reverse charging, phase connects the first memory element with the signal path referenced to the reference potential (GND) , so that charge stored in the first memory element is discharged via the signal path referenced to the reference potential (GND) . [A603]

"Systems and methods for semi-autonomous convoying of vehicles"

The present invention relates to systems and methods for facilitating participants of vehicular convoys to closely follow one another through partial automation. Following closely behind another vehicle has significant fuel savings benefits, but is unsafe when done manually by the driver. On the opposite end of the spectrum, fully autonomous solutions require inordinate amounts of technology, and a level of robustness that is currently not cost effective. [A604]

"Severe weather situational awareness system and related methods"

A severe weather detection and warning method may include collecting atmospheric sounding data from at least one satellite atmospheric sounding device corresponding to a grid of localized regions, with the atmospheric sounding data including geospatial location and elevation components. The method may further include collecting weather radar data for the grid of localized regions from at least one radar station, determining a location and direction of travel of at least one moisture system based upon the weather radar data, and determining respective atmospheric instability levels for the localized regions based upon the atmospheric sounding data. The method may also include determining when the direction of travel of the at least one moisture system is approaching a given localized region having an atmospheric instability level above an instability threshold, and generating a severe weather warning indication based thereon. [A605]

"Evaluating surface data"

Systems, methods, and instructions encoded in a computer-readable medium can perform operations related to evaluating surface data. Geodetic data for a plurality of surface locations are received. The geodetic data may include surface gradient information and/or surface elevation information for multiple surface locations. A set of constraining relationships is generated based on the geodetic data. The set of constraining relationships relates undetermined values of surface elevation movement and/or undetermined values of surface gradient movement to measured surface elevation changes and/or measured surface gradient changes. Some or all of the constraining relationships include multiple undetermined values. Particular values for surface elevation movements and/or particular values for surface gradient movements are calculated for multiple surface locations based on determining a solution to the set of constraining relationships. In some implementations, a minimum curvature surface may be generated deterministically based on the geodetic data and the particular values identified using the constraining relationships. [A606]

"Generating a map using radar data"

Various implementations described herein are directed to generating a map using radar data. In one implementation, a non-transitory computer-readable medium may have stored thereon a plurality of computer-executable instructions which, when executed by a computer, cause the computer to receive radar data for a marine environment proximate to a vessel, where the radar data are received from a radar sensor disposed on or proximate to the vessel. The computer-executable instructions may further be configured to cause the computer to generate a map of one or more substantially stationary objects in the marine environment based on the radar data. [A607]

"System and method for ground penetrating radar communication using antenna crosstalk"

An object detection system (24) is disclosed having a transducer (40, 40') for detecting buried objects (26) . The transducer is encapsulated within a robust, electromagnetically transparent construction (42) . [A608]

"Almost real-time sampling for ground-penetrating radar impulses"

A ground-penetrating RADAR-based system can include a transmitter configured to transmit multiple RADAR impulses and a receiver configured to receive a signal comprising return waves generated responsive to the transmitted RADAR impulses. The signal can include a direct wave portion and a reflected wave portion. The system can also include a processing unit configured to analyze the return waves by determining the direct wave portion, fitting the direct wave portion to determine parametric information corresponding to the return waves, determining the reflected wave portion, determining characteristics of the reflected wave portion based on the parametric information, and comparing the determined characteristics against known characteristics. [A609]

"Detecting an underground object"

In a method of detecting an underground object which is at least partially under a surface of ground, a first view of the object determined by transmitting a first radar signal from a first known geolocation. A second view of the object is determined by transmitting a second radar signal from a second known geolocation. The respective first and second trajectories of the first and second radar signals are oblique with respect to the surface of the ground and the respective first and second trajectories are at a first angle with respect to each other. A position of the object is estimated by maximizing a correlation between the first view and the second view by adjusting an estimated dielectric constant associated with medium between the object and the surface of the ground. [A610]

"Method and apparatus for processing coded aperture radar (CAR) signals"

A radar system in which Coded Aperture Radar processing is performed on received radar signals reflected by one or more objects in a field of view which reflect a transmitted signal which covers a field of view with K sweeps and each sweep including Q frequency changes. for Type II CAR, the transmitted signal also includes N modulated codes per frequency step. The received radar signals are modulated by a plurality of binary modulators the results of which are applied to a mixer. The output of the mixer, for one acquisition results in a set of QK (for Type I CAR) or QKN (for Type II CAR) complex data samples, is distributed among a number of digital channels, each corresponding to a desired beam direction. for each channel, the complex digital samples are multiplied, sample by sample, by a complex signal mask that is different for each channel. [A611]

"Systems and methods for avian mitigation for wind farms"

A wildlife detection system includes a tracking device, a receiver, and a wildlife deterrent system. The tracking device may be mounted to a wildlife. The receiver is configured to track movement of the tracking device relative to an object of danger to the wildlife. The wildlife deterrent system is configured to reduce risk of danger to the wildlife in response to movement of the wildlife within a predetermined distance from the object of danger as tracked by the receiver. [A612]

"System and method for fuel savings and safe operation of marine structure"

A system for monitoring a physical change of a marine structure includes a complex optical measuring instrument configured to detect a behavior and structural change of the marine structure by using at least one optical sensor by means of optical fiber Bragg grating. [A613]

"Preceding vehicle selection apparatus"

A preceding vehicle selection apparatus estimates a curvature of a traveling road on which an own vehicle is traveling, detects an object ahead of the own vehicle, and determines a relative position in relation to the own vehicle, for each object ahead. Based on the estimated curvature and the determined relative position, an own vehicle lane probability instantaneous value for each object ahead is repeatedly determined. An own vehicle lane probability is determined by performing a filter calculation on the calculated own vehicle lane probability instantaneous value. Based on the determined own vehicle lane probability, a preceding vehicle is selected. Characteristics of the filter calculation are set such that an object ahead associated with a preceding vehicle selected in a previous processing cycle is relatively less affected by the own vehicle lane probability instantaneous value than an object ahead associated with an object other than the preceding vehicle. [A614]

"Locating parts with electromagnetic identification (EMID) tags for contextual visualization"

In one or more embodiments, a disclosed method involves transmitting a first transmit signal (s) having a first signal strength and/or a first field of view (FOV) , thereby establishing a first radiation region. The method further involves receiving a first receive signal (s) radiated from an EMID tag (s) . Also, the method involves transmitting a second transmit signal (s) having a second signal strength and/or a second field of view (FOV) , thereby establishing a second radiation region. In addition, the method involves receiving a second receive signal (s) radiated from an EMID tag (s) . Additionally, the method involves subtracting the second radiation region from the first radiation region to determine a difference region. Also, the method involves determining which of the EMID tags are located within the difference region by using the first receive signal (s) and the second receive signal (s) . Further, the method involves determining a location of the EMID tag (s) located within the difference region. [A615]

"Mapping active and inactive construction zones for autonomous driving"

Aspects of the present disclosure relate to differentiating between active and inactive construction zones. In one example, this may include identifying a construction object associated with a construction zone. The identified construction object may be used to map the area of the construction zone. Detailed map information may then be used to classify the activity of the construction zone. The area of the construction zone and the classification may be added to the detailed map information. Subsequent to adding the construction zone and the classification to the detailed map information, the construction object (or another construction object) may be identified. The location of the construction object may be used to identify the construction zone and classification from the detailed map information. The classification of the classification may be used to operate a vehicle having an autonomous mode. [A616]

"Apparatus and method for using radar to evaluate wind flow fields for wind energy applications"

The present invention provides an apparatus and method for obtaining data to determine one or more characteristics of a wind flow field using one or more radars. Data is collected from the one or more radars, and analyzed to determine the one or more characteristics of the wind flow field. The one or more radars are positioned to have a portion of the wind flow field within a scanning sector of the one or more radars. [A617]

"Radar device and target height calculation method"

In an in-vehicle radar device, as a vertical azimuth which is an azimuth of a target in a direction perpendicular to a ground surface, a real image vertical azimuth which is an azimuth of a real image existing above ground is calculated from a reflected wave generated when a transmission signal transmitted from a transmission antenna is reflected from the target, and a virtual image vertical azimuth which is an azimuth of a virtual image existing underground is calculated from a reflected wave generated when the transmission signal transmitted from the transmission antenna is reflected from the target and reflected again from the ground surface. Next, in the in-vehicle radar device, an angle difference between the real image vertical azimuth and the virtual image vertical azimuth is calculated, and a height of the target from the ground surface is calculated using the calculated angle difference. [A618]

"Vehicular radar sensing system utilizing high rate true random number generator"

A radar sensing system for a vehicle includes transmit and receive pipelines. The transmit pipeline includes transmitters able to transmit radio signals. The receive pipeline includes receivers able to receive signals. The received signals are transmitted signals that are reflected from an object. The transmit pipeline phase modulates the signals before transmission, as defined by a first binary sequence. The receive pipeline comprises an analog to digital converter (ADC) for sampling the received signals. The transmit pipeline includes a pseudorandom binary sequence (PRBS) generator for outputting a second binary sequence of bits with an equal probability of 1 and 0. The first binary sequence is defined by least significant bit (LSB) outputs from the ADC and the second binary sequence of bits. The first binary sequence comprises a truly random unbiased sequence of bits with an equal probability of 1 and 0. [A619]

"Spatial recognition of RFID tag placement using antenna multiplexing"

A system to determine the placement of multiple RFID tags uses multiple antennae. The RF communication (or NFC) includes read and/or read/write communication with the RFID tags. [A620]

"Ultra-wide band antenna arrays and related methods in personal emergency response systems"

A non-wearable Personal Emergency Response System (PERS) architecture is provided, implementing RF interferometry using synthetic aperture antenna arrays to derive ultra-wideband echo signals which are analyzed and then processed by a two-stage human state classifier and abnormal states pattern recognition. Systems and methods transmit ultra-wide band radio frequency signals at, and receive echo signals from, the environment, process the received echo signals to yield a range-bin-based slow signal that is spatio-temporally characterized over multiple spatial range bins and multiple temporal sub-frames, respectively, and derive from the slow signal multiple characteristics of human (s) in the environment. The reception antennas may be arranged in several linear baselines, implement virtual displacements, and may be set into multiple communicating sub-arrays. The decision process is carried out based on the instantaneous human state (local decision) followed by abnormal states patterns recognition (global decision) . [A621]

"Human posture feature extraction in personal emergency response systems and methods"

A non-wearable Personal Emergency Response System (PERS) architecture is provided, implementing RF interferometry using synthetic aperture antenna arrays to derive ultra-wideband echo signals which are analyzed and then processed by a two-stage human state classifier and abnormal states pattern recognition. Systems and methods transmit ultra-wide band radio frequency signals at, and receive echo signals from, the environment, process the received echo signals to derive a spatial distribution of echo sources in the environment using spatial parameters of the at least one transmitting and/or receiving antennas, and estimate postures human (s) in the environment by analyzing the spatial distribution with respect to echo intensity. The antennas may be arranged in several linear baselines, implement virtual displacements, and may be set into multiple communicating sub-arrays. The decision process is carried out based on the instantaneous human state (local decision) followed by abnormal states patterns recognition (global decision) . [A622]

"Method, system and calibration target for the automatic calibration of an imaging antenna array"

The system (1) is used for the automatic calibration of an imaging-antenna arrangement (2) using an evaluation unit (4) . The antenna arrangement (2) transmits signals (6) and receives the signals (6') reflected from a calibration object (3) of known shape. The calibration object (3, 31, 32) provides at least one diffuse reflector (8) . In the evaluation method, position coordinates of the calibration object (3) are entered, and the following method steps are implemented after the measurement of the reflected signals (6') : i. Calculation of the reflections of the calibration object (3, 31, 32) , ii. Calculation of calibration data, iii. Preparation of an image of the calibration object with the use of the calibration data, iv. Determination of corrected position coordinates by evaluating the image of the at least one diffuse reflector, v. Implementation of steps i. to iv. with corrected position coordinates. [A623]

"Automotive sensor alignment with external IMU tool"

An inertial measurement unit (IMU) may be used to align a plurality of radar units coupled to a vehicle via a plurality of mounting structures. The IMU may be placed at a reference location and reference-location data may be captured. The IMU may be coupled to each of the mounting structures and, at each mounting structure, respective mounting-location inertial measurement data may be captured using the IMU. for each mounting structure, a measured roll angle, measured elevational angle, and measured azimuthal angle is determined based on at least the mounting-location inertial measurement obtained at the mounting structure and the reference inertial measurement. Further, for each mounting structure, offsets are determined for the measured roll angle, the measured elevational angle, and the measured azimuthal angle. One or more of the mounting structures and/or radar units are adjusted based on one or more of the offsets. [A624]

"System and method for doppler aided navigation using weather radar"

An airborne navigation system that uses Doppler information from an on-board weather radar to improve the system's accuracy and/or fault tolerance. The system can determine a drift angle and ground speed from Doppler information associated with radar returns from the Earth's surface. Alternatively, the system can be configured to determine heading angle using the drift angle and a track angle received from another sensor. [A625]

"Combined radar and GPS localization system"

A localization system within a vehicle in one embodiment includes a global position system (GPS) receiver, a radar sensor, a data storage device including program instructions stored therein, a symbolic map stored within the data storage device, and a controller operatively coupled to the data storage device, the GPS receiver, and the radar sensor, the controller configured to execute the program instructions to analyze data from the GPS receiver, data from the radar sensor, and data from the stored symbolic map, and determine a probabilistic vehicle location based upon the analysis. [A626]

"Predictive reasoning for controlling speed of a vehicle"

Methods and systems for predictive reasoning for controlling speed of a vehicle are described. A computing device may be configured to identify a first and second vehicle travelling ahead of an autonomous vehicle and in a same lane as the autonomous vehicle. The computing device may also be configured to determine a first buffer distance behind the first vehicle at which the autonomous vehicle will substantially reach a speed of the first vehicle and a second buffer distance behind the second vehicle at which the first vehicle will substantially reach a speed of the second vehicle. The computing device may further be configured to determine a distance at which to adjust a speed of the autonomous vehicle based on the first and second buffer distances and the speed of the autonomous vehicle, and then provide instructions to adjust the speed of the autonomous vehicle based on the distance. [A627]

"Method and control unit for monitoring traffic"

The present invention relates to a method of identifying the hand of traffic applicable to a subject vehicle (3) . The subject vehicle (3) travels in a first direction and has a first side and a second side. The method comprises tracking at least a first object vehicle (V) on the first side of the subject vehicle (3) , and/or detecting the presence or absence of at least a first stationary target (T) on the first side of the subject vehicle (3) . A direction of travel of each first object vehicle (V) is determined in relation to the subject vehicle (3) . The hand of traffic is identified based on the direction of travel of each first object vehicle (V) , and/or the presence or absence of each first stationary target (T) . The invention also relates to a method of implementing Adaptive Cruise Control (ACC) using the hand of traffic information. The invention also relates to a control unit (1) for determining the hand of traffic. [A628]

"Radar level measurement"

Disclosed is a method of measuring the level of a liquid in a vessel, such as a chemical reactor, by radar. The method particularly pertains to situations wherein a supercritical fluid is present above the liquid. More particularly, the method serves to cope with the typical vigorous circumstances of a chemical reaction, such as urea synthesis. The invention foresees the use of a tube extending into the liquid, so as to guide the radar waves to the surface level of the liquid. [A629]

"Weather radar with bright band suppression"

This disclosure is directed to methods, devices, and systems for generating a weather radar output with bright band suppression. In one example, a method includes determining, for each of several portions of a vertical column from a weather radar signal, a reflectivity range selected from a highest reflectivity range and one or more lower reflectivity ranges. The method further includes determining, in response to determining that portions of the vertical column are in the highest reflectivity range, whether a combination of the reflectivity ranges of the portions of the vertical column meet criteria indicative of high-reflectivity stratiform weather. The method further includes generating, in response to determining that the combination of the reflectivity ranges of the portions of the vertical column meet the criteria indicative of high-reflectivity stratiform weather, a weather radar output that indicates each of the portions of the vertical column as associated with one of the lower reflectivity ranges. [A630]

"Detection of radar objects using a radar sensor of a motor vehicle"

In a method for detecting radar objects with the aid of a radar sensor of a motor vehicle, a transmitted signal has a sequence of frequency modulations, to each of which a partial signal of a measuring signal is assigned, first information about the relative velocity and the distance of a radar object is ascertained based on a frequency spectrum of at least one of the partial signals, second information about the relative velocity and the distance of the radar object is ascertained based on a frequency spectrum of a time curve of values of frequency spectra of the partial signals at a frequency position of the radar object in these frequency spectra, and the relative velocity and the distance of the radar object are ascertained based on matching of the first information with the second information. [A631]

"Radar device"

A radar transmitting unit Tx transmits a radio-frequency radar transmission signal from a transmission antenna which is inclined in the direction of a depression angle .phi.. A radar receiving unit Rx estimates the height and speed of a vehicle which travels on a road surface using a reflected wave signal from the vehicle. A template generating unit 19 generates a variation in a phase component of the reflected wave signal corresponding to N heights and speeds of the vehicle as N templates. N vehicle height/speed template correlation calculation units #1 to #Nrep calculate correlation on the basis of any one of the N templates and a correlation value between the reflected wave signal and a transmission code of the radar transmission signal. [A632]

"Weather radar"

Weather radar for measuring radar signals in the GHz range with a receiver containing at least one signal path, the receiver comprising a receiving facility for an incoming radar signal, on which a test signal generated by a test signal generator is superimposed in a coupler, and a processing device to amplify, filter and convert both signals to lower frequencies, wherein for filtering a matched filter is provided, and with an evaluation device in which calibration parameters of the signal path are derived from the test signal for the frequency of the test signal in order to determine the signal strength of the received radar signal, wherein the test signal is superimposed with at least one frequency differing from the frequency of the radar signal, so that the radar signal and the test signal are processed separately from one another by the evaluation device, and the calibration parameters of the signal path for the frequency of the radar signal are determinable from the test signal through a modeling of the frequency dependence of the calibration parameters for frequencies around those of the radar signal. [A633]

"Automated setting of cruising speeds"

An approach to setting a cruise control speed based on identifying a vehicle operator and analyzing metadata associated with the vehicle operator. The identity of the vehicle operator and any passengers is determined based on identity sensors in the vehicle or by manual identity entry. Metadata, associated with the vehicle operator, is retrieved from the metadata database, located either locally or remotely. The metadata is analyzed based on factors such as the current route and the identity of any passengers. The cruise control speed is set based on the results of the analysis. Any changes to the setting are updated in the metadata database. [A634]

"Metamaterial-based object-detection system"

An object-detection system for, e.g., a vehicle collision avoidance system, utilizes a metamaterial-based phase shifting element array to generate a scan beam by varying the effective capacitance of each metamaterial structure forming the array in order to control the phases of their radio frequency output signals such that the combined electromagnetic wave generated by the output signals is reinforced in the desired direction and suppressed in undesired directions to produce the scan beam. The metamaterial structures are configured to resonate at the same radio wave frequency as an incident input signal (radiation) , whereby each metamaterial structure emits an associated output signal by way of controlled scattering the input signal. A variable capacitance is applied on each metamaterial structure, e.g., using varicaps that are adjusted by way of phase control voltages, to produce the desired output phase patterns. The metamaterial structures are constructed using inexpensive metal film or PCB fabrication technology. [A635]

"Tsunami monitoring radar system including transmitting antenna for radiating transmission signal for detecting tsunami as radio wave toward sea"

A tsunami monitoring system includes a transmitting antenna configured to radiate a transmission signal to detect a tsunami as a radio wave toward a sea, and a receiving antenna configured to receive reflected waves reflected by the tsunami as a receiving signal. The tsunami monitoring system includes a signal generator circuit configured to generate the transmission signal having a predetermined frequency, a signal processor portion configured to generate a beat signal of a frequency difference between the transmission signal and the receiving signal, and a wave height estimator portion configured to divide a radio wave radiation region into a plurality of regions, calculate a flow velocity of a sea surface of the tsunami for each region on the basis of the beat signal, and estimate a wave height of the tsunami from a calculated flow velocity. [A636]

"Device for monitoring a distance between a vehicle and an object"

A device for monitoring a distance between a vehicle and object, including distance sensors mounted in the front and/or rear vehicle region (s) , an electronic unit connected thereto, and a display device for visually and/or acoustically displaying distances. The electronic unit generating a full warning signal even prior to reaching the predefined minimum limiting value for an ascertained distance at an established first warning distance value which is greater than the minimum limiting value of a first sensor, if a distance, which is smaller than a first limiting value, is ascertained by a direct echo of the first sensor, the first limiting value being greater than the minimum limiting value of the first sensor, and if a distance, which is greater than a second limiting value, is ascertained by a direct echo of the second sensor, the second limiting value being greater than the minimum limiting value of the second sensor. [A637]

"Method of electronically mapping underground utility infrastructures from the surface"

A non-invasive method of buried-utility-mapping includes using a long wavelength gradiometric ground penetrating radar to "see" patches of conductive material below ground and buried pipes and electrical conductors that are all constantly radio-illuminated by local AM radio broadcasts. The underground infrastructure of entire cities can be surveyed this way, point-by-point over time. A short wavelength part of the gradiometric ground penetrating radar operates shoulder-to-shoulder with the magnetic part and is able to improve shallow object resolution, map moisture build-ups under roads, and spot contaminated soils. Two gradiometric ground penetrating radar technologies, cameras, and navigation receivers can be mounted on city vehicles and a daily collection of their data batch transformed by digital processing algorithms into detailed and automatically updating false-color maps of the underground utilities of the whole city and other buried infrastructures. [A638]

"Ground penetrating radar with variable dwell time"

An object detection system may be capable of sensing a buried object and providing an estimate of the object's depth. The object detection system may comprise a signal generator transmitting one or more signals. At least one of the signals may be directed toward the buried object and reflected off of the object back to the system. At least one of the signals may be transmitted along a variable length path. A correlator may then receive the signals and determine an offset between their arrival times at the correlator. The variable length path may then be adjusted over a range which includes a minimum offset indicating a distance to the object. [A639]

"MIMO radar system"

Various exemplary embodiments relate to a method for detecting an object using radar system having M transmit antennas, N receive antennas, and a processor, including: receiving, by the processor, N.times.M digital signals, wherein the N receivers receive M received signals corresponding to M sequences of encoded transmitted signals resulting in N.times.M digital signals, processing the N.times.M digital signals to produce N.times.M first range/relative velocity matrices, applying a phase compensation to N.times. (M-1) first range/relative velocity matrices to compensate for a difference in range between the N.times. (M-1) first range/relative velocity matrices and the Mth range/velocity matrix, decoding the M phase compensated range/relative velocity matrices for the N receivers using an inverse of the transmit encoding to produce M decoded phase range/relative velocity matrices for the N receivers, detecting objects using the M range/relative velocity matrices for the N receivers to produce a detection vector. [A640]

"Self-diagnosing FMCW radar level gauge"

A self-diagnosing FMCW radar level gauge and a method for providing self-diagnosing with a radar level gauge is provided in a radar level gauge comprising a transceiver, a mixer, a signal propagating device and a signal propagation path connecting the transceiver and the signal propagating device, a filter arrangement and processing circuitry. The filter arrangement provides a filtered intermediate frequency signal. The transceiver outputs either a diagnostic sweep configured such that a reference echo from the signal propagation path is detectable in said filtered intermediate frequency signal, or a measurement sweep configured such that the reference echo is suppressed in the filtered intermediate frequency signal and that a surface echo is detectable. The processing circuitry is configured to self-diagnose the radar level gauge based on the reference echo, and to determine the distance to the surface based on the surface echo. [A641]

"Guided wave radar level gauging with probe retaining element"

A GWR level gauge system for determining a filling level in a tank. The system comprises a tank, a transceiver, a surface waveguide comprising a single conductor transmission line probe, connected to the transceiver, arranged extending vertically into the tank and configured to guide the electromagnetic transmission signals towards the surface and to guide the reflected electromagnetic signals back to the transceiver, processing circuitry connected to the transceiver and configured to determine the filing level based on received reflected electromagnetic signals, a plurality of retaining elements arranged in fixed positions in relation to an inside of the tank and spaced apart along the probe, wherein each of the retaining elements circumscribes the probe, and is configured to allow movement of the probe in a vertical direction relative the retaining element, and to restrict movement of the probe in a horizontal direction relative the retaining element. [A642]

"System and method for selecting a Wi-Fi access point for position determination"

Methods, systems, computer-readable media, and apparatuses for position determination are presented. In some embodiments, a method for position determination includes selecting at least one of a plurality of access points based on a measure of response time variability associated with the at least one access point. The method further includes sending, from a device, a communication to the selected at least one access point. The method also includes receiving, from the selected at least one access point, a response to the communication. The method additionally includes calculating a distance from the device to the selected at least one access point based on a round trip time associated with the response to the communication. [A643]

"Rotation based alignment of a group of wireless tags"

A method for determining a location of a wireless tag, the method may include generating or receiving, by a tagged mobile device, an estimated location of another tag that communicates with the tagged mobile device, receiving or generating, by the tagged mobile device, multiple distance measurements that are obtained during different points of time, wherein the multiple distance measurements are obtained during a rotational movement of the tagged mobile device and represent distances between the tagged mobile device and the other tag, finding a certain angle of rotation of the mobile device that corresponds to a minimal distance measurement of the multiple distance measurements, and amending the estimated location of the other tag based upon the certain angle of rotation. [A644]

"Image sensor, image processing system including the same, and method of operating the same"

An image sensor includes a photo gate controller configured to generate a plurality of demodulated signals respectively corresponding to a plurality of rows of a pixel array and a photo gate driver configured to adjust a phase of the demodulated signals using a source clock signal to remove power, voltage and temperature (PVT) noise and to apply the phase-adjusted demodulated signals to the pixel array. The image sensor matches the phases of the respective demodulated signals using the source clock signal generated based on a reference clock signal, thereby increasing the quality of depth images. [A645]

"Coded aperture beam analysis method and apparatus"

A method and apparatus for determining the range, radial velocity, and bearing angles of scattering objects reflecting RF signals or for determining the range, radial velocity, and bearing angles of sources RF signals. An array of antenna elements is utilized, the array of antenna elements each having an associated two state modulator wherein transmitted and/or received energy is phase encoded according to a sequence of multibit codes, the bits of the multibit codes each preferably having two states with approximately a 50% probability for each of the two states occurring within each given multibit code in said sequence of multibit codes, thereby allowing the determination of range, radial velocity, and bearing angles through digital computation after the scattered signals have been received. [A646]

"Method for determining and/or monitoring fill level of a medium in a container"

A method for determining and/or monitoring fill level of a medium in a container with a measuring device, which works according to the travel time measuring method, wherein measurement signals are transmitted toward the medium and are received, wherein from the high-frequency total measurement signal, composed by superimposing the transmitted measurement signals, the reflected wanted echo signals and the disturbance echo signals, a raw echo curve or digitized envelope curve is ascertained. The wanted echo signals and/or the disturbance echo signals in the raw echo curve or the digitized envelope curve are ascertained based on an ideal echo curve, which shows the amplitude of the echo signals of an ideal reflector as a function of the distance from the ideal reflector, and based on the ascertained wanted echo signal the fill level is determined. [A647]

"Decorative member for vehicle"

A vehicular decorative member is curved as a forward-bulging shape, and includes a transparent base, a transferred layer, a metallic layer, and a base layer. The transparent base includes a front face, and a rear face. The transparent base's rear face has an ordinary section, and a recessed section. The transferred layer, the metallic layer, and the base layer are disposed on the transparent base's rear-face side in this order. The vehicular decorative member further includes a transfer sheet turning into the transferred layer. The transfer sheet includes a support film, and an adhesive layer, a decorative layer and a release layer that are formed on the support film in this order. The transfer sheet makes the transferred layer when the support film is removed from the release layer after pressing the transfer sheet onto the transparent base's ordinary section while heating the transfer sheet. [A648]

"Antenna for wireless underground communication"

Systems and methods are disclosed for an underground antenna structure for radiating through a dissipative medium, the antenna structure. The antenna structure includes a dielectric substrate, a feeding structure disposed on the substrate, and one or more electrical conductors. The one or more electrical conductors are disposed on the substrate, oriented, and buried within the dissipative medium. The electrical conductors are also adapted to radiate signals at a frequency in a half-space adjacent to the dissipative medium. The adaptation include a beamwidth state for one or more of the electrical conductors based at least in part on the relative permittivity of the dissipative medium. [A649]

"Evaluating surface data"

Systems, methods, and instructions encoded in a computer-readable medium can perform operations related to evaluating surface data. Geodetic data for a plurality of surface locations are received. The geodetic data may include surface gradient information and/or surface elevation information for multiple surface locations. A set of constraining relationships is generated based on the geodetic data. The set of constraining relationships relates undetermined values of surface elevation movement and/or undetermined values of surface gradient movement to measured surface elevation changes and/or measured surface gradient changes. Some or all of the constraining relationships include multiple undetermined values. Particular values for surface elevation movements and/or particular values for surface gradient movements are calculated for multiple surface locations based on determining a solution to the set of constraining relationships. In some implementations, a minimum curvature surface may be generated deterministically based on the geodetic data and the particular values identified using the constraining relationships. [A650]

"Driver convenience system and method for determining vertical angle abnormality of radar therein"

A driver convenience system for determining a vertical angle abnormality of a radar includes: a radar which is mounted on a vehicle to detect vehicle-ahead information, and an electronic control unit which controls driving of the vehicle based on the vehicle-ahead information detected by the radar. The electronic control unit includes: a monitoring unit configured to monitor a stationary object based on the vehicle-ahead information detected by the radar, an updating unit configured to update a maximum detection distance between the stationary object monitored by the monitoring unit and the vehicle, a vertical angle estimating unit configured to estimate a vertical angle of the radar by using the maximum detection distance updated by the updating unit, and a determining unit configured to determine that a vertical angle abnormality occurs in the radar when the estimated vertical angle is out of a preset required mount angle. [A651]

"Animal health and wellness monitoring using UWB radar"

A collar with an ultra-wideband radar is described. A housing contains sensor electronics and the transmit and receive antennas are located separate from the housing around the circumference of the collar. A first example of the collar includes a first transmit antenna and a first receive antenna. A second example of the collar adds a second transmit antenna and a second receive antenna. [A652]

"Systems and apparatus for the light-based communication of service orders and personal objects identification"

Light-based systems for communicating information associated with service orders and/or the identification of personal objects are disclosed. A personal mobile electronic communication device is used in conjunction with a communication network and a lighting controller to communicate service orders by lighting with one or more individually controllable luminaries in a lighting network. A personal mobile electronic communication device is, alternatively or additionally, used in conjunction with a communication network, a memory, and a lighting controller controlling to indicate by lighting whether there is an association between the personal mobile electronic communication device and a personal item. [A653]

"Alignment method and system for radar of vehicle"

A vertical alignment method for a radar of a vehicle includes the steps of radiating radio wave to a forward ground by a radar which is installed on the vehicle, receiving reflected wave which is reflected from the ground, and determining whether or not a vertical misalignment of the radar occurs, based on the reflected wave. [A654]

"Game console and gaming object with motion prediction modeling and methods for use therewith"

A game console includes a receiver that receives motion data in response to motion of a gaming object. A trajectory generation module generates trajectory data based on the motion data and based on a motion prediction model. A processor executes a gaming application based on the trajectory data to generate display data. [A655]

"Vehicle--mounted transducer"

A communication system, including an apparatus, method and program, is provided for communicating a message from a vehicle to a location. The communication system detects a distance to an object that is located at the location and a speed of the vehicle. A target distance is then calculated on the basis of the detected distance to the object and the detected speed of the vehicle. A determination is made as to whether the object is configured for communication with the vehicle. According to the determination, a message is communicated to the object from the vehicle. [A656]

"Managing a sphere of wireless tags"

A method for managing a sphere of wireless tags, the method comprises programming, by a wireless reader, a group of wireless tags to belong to the sphere of wireless tags, sending by the wireless reader sphere beacons aimed to the wireless tags of the sphere, detecting a loss of a wireless tag of the sphere if the wireless tag did not respond to a predetermined number of sphere beacons, and responding to the detecting of the loss of the wireless tag. [A657]

"Athletic performance monitoring systems and methods in a team sports environment"

Systems, apparatuses, and methods for determining when an athlete is in possession of a ball by analyzing image data are provided. A camera is worn by an athlete and is turned on when the athlete is in proximity of a ball. The camera is used to generate an image of a ball. The size of the ball is determined and compared to a threshold. The athlete is considered to be in possession of the ball when the size of the image exceeds the threshold. [A658]

"Dual-polarization weather radar data system and method"

The present invention essentially comprises a system, method, computer program and combinations thereof to utilize dual-polarization generated data generally associated with weather and non-weather events for mapping data, producing geo-referenced data, producing mosaics, generation of precipitation masks, non-precipitation mask, and classification masks in general, production of vertical cross sections and predetermined fly throughs, producing short term forecasting, prediction of specific weather phenomenon, correcting or adjusting rain gauge data as well as quantitative precipitation estimation, and combining other meteorological data to correct or adjust estimated rainfall accumulation gathered by dual-polarization radar. [A659]

"Radar device and velocity calculation method"

It is an object of the present invention to provide a radar device and a velocity calculation method with which velocity can be calculated more accurately. A radar device 1 comprises a transmitter 23, a first velocity calculator 31a, a second velocity calculator 31b, a first velocity corrector 33a, and a second velocity corrector 33b. The transmitter 23 transmits pulse signals at two or more different pulse repetition frequencies. The first velocity calculator 31a calculates a first Doppler velocity based on a first received signal. The second velocity calculator 31b calculates a second Doppler velocity based on a second received signal. The first velocity corrector 33a calculates a first corrected Doppler velocity by folding correction of the first Doppler velocity. The second velocity corrector 33b calculates a second corrected Doppler velocity by folding correction of the second Doppler velocity. [A660]

"Method for detecting, over several antenna revolutions, slow-moving targets buried in the radar clutter, using a mobile radar having a rotary antenna"

A method for detecting targets using a mobile radar having a rotary antenna, notably small targets buried in radar clutter, without increasing the number of false detections, includes determining pre-detections during N antenna revolutions, including determining pre-detections revolution by revolution, each pre-detection being stored in a grid of cells centered on the position that the radar occupied at the start of the current revolution, each grid cell corresponding to an azimuth range and a distance range. This step also includes, at the end of each revolution, a step of shifting all the pre-detections stored in the grid during the previous revolutions by the movement undergone by the radar during the last revolution. The method also includes determining detections, a target being detected from the moment that a set of pre-detections stored in the grid has its distances to the radar which constitute a linear progression during the N antenna revolutions. [A661]

"Athletic performance monitoring systems and methods in a team sports environment"

Systems, apparatuses, and methods estimate the distance between a player and a ball by transmitting a chirp (sweep signal) to a radio tag located on the ball. During the chirp, the frequency of the transmitted signal is changed in a predetermined fashion. The radio tag doubles the transmitted frequency and returns the processed signal to a transceiver typically located on the player. The currently transmitted frequency is then compared with the received frequency to obtain a difference frequency from which an apparatus may estimate the distance. The apparatus may simultaneously receive the processed signal from the radio tag while transmitting the sweep signal. [A662]

"Forward facing sensing system for vehicle"

A forward facing sensing system for a vehicle includes a radar sensor device disposed within the vehicle and having a sensing direction forward of the vehicle. An image sensor is disposed behind and views through the vehicle windshield. A control includes an image processor that analyzes captured image data to, at least in part, detect a pedestrian present exterior of the vehicle in its direction of forward travel. The control, responsive at least in part to processing of captured image data and to sensing by the radar sensor, determines that a potentially hazardous condition may exist in the vehicle's path of forward travel. The radar sensor device and the image sensor collaborate in a way that enhances determination of existence of the potentially hazardous condition in the vehicle's path of forward travel. The control at least in part controls an adaptive cruise control system of the vehicle. [A663]

"Preceding vehicle selection apparatus"

In a preceding vehicle selection apparatus, for each object ahead, a relative position, a relative speed, and width information indicating a lateral width are determined. A lateral position of the object ahead with reference to a traveling direction of the own vehicle is corrected by using the width information of the object ahead. Based on the relative position of the object ahead of, which the lateral position has been corrected, an own vehicle lane probability is calculated for each object ahead. A preceding vehicle is selected from the objects ahead based on the calculated own vehicle lane probability. Based on a value of a correlated parameter that has correlation with error in the lateral position or error in the width information, a correction amount of the lateral position is reduced as error in the lateral position or error in the width information becomes large. [A664]

"Method and device for detecting a rotating wheel"

A method is described for detecting a rotating wheel of a vehicle that is travelling on a roadway in a travel direction, the wheels of which are at least partially exposed laterally, the method comprising: emitting an electromagnetic measurement beam having a known temporal progression of its frequency onto a first section above the roadway in a direction in a slant with respect to the vertical and normally or at a slant with respect to the travel direction, receiving a reflected measurement beam and recording the temporal progression of its frequencies, relative to the known progression, as a reception frequency mixture progression, and detecting a frequency band, which is continuously inclining or declining over a period of time, in the reception frequency mixture progression as a wheel. A device for conducting the method is also described. [A665]

"Multi-path mitigation in rangefinding and tracking objects using reduced attenuation RF technology"

An autonomous system with no Customer Network Investment is described, wherein the system is configurable to operate on a band other than the LTE band. Such system allows the definition of hybrid operations to accommodate the positioning reference signals (PRS) of LTE and already existing reference signals. The system can operate with PRS, with other reference signals such as cell-specific reference signals (CRS) , or with both signal types. As such, the system provides the advantage of allowing network operator (s) to dynamically choose between modes of operation depending on circumstances, such as network throughput and compatibility. [A666]

"FMCW based guided wave radar level gauge"

An FMCW type radar level gauge configured to transmit an electromagnetic transmit signal and receive an electromagnetic return signal reflected from the surface, the electromagnetic transmit signal having a bandwidth of at least 1 GHz, a relative bandwidth (max frequency/min frequency) of less than 2.5 and an upper frequency limit less than 4 GHz. The gauge comprises a single conductor probe mechanically suspended in the tank and extending into the product in the tank, and a matching arrangement providing an electrically matched connection between an electrical feed-through and the single conductor probe. According to the present invention, the relatively expensive still-pipe is replaced with a relatively inexpensive a single conductor acting as a surface wave-guide (SWG) . [A667]

"Travel distance measurement device"

A travel distance measurement device includes a transmitting antenna that is disposed in a vehicle and emits a transmission signal, as a radio wave, toward a ground surface, a receiving antenna that is disposed in the vicinity of the transmitting antenna, and receives a radio wave reflected from the ground surface and acquires a reflection signal, and a distance calculator (an IQ demodulator and a phase conversion integrator) that calculates the travel distance of the vehicle on the basis of the phase of the acquired reflection signal. [A668]

"Tracking device"

A targetless tracking device has a detector configured to receive scattered radiation indicative of the presence of an object. The device also has a processor which is configured to calculate a positional relationship between the device and the object based on the scattered radiation, receive an indication of a desired positional relationship to the object, and output an error signal indicative of the positional relationship versus the desired positional relationship so that the device position is able to be controlled to reduce the error signal. The processor creates first and second images at first and second points in time, respectively, and compares the first and second images in order to calculate the positional relationship. [A669]

"Radar sensor for motor vehicles"

A radar sensor for motor vehicles, having an antenna system that can be controlled by a control device so that it has a temporally varying directional characteristic, and having an evaluation device for evaluating the radar echoes received by the antenna system and for the location of objects using angular resolution, wherein the antenna system has at least two groups of antenna elements that differ in elevation in their effective direction, and the control device is fashioned to activate and deactivate the two groups in periodically alternating fashion, and the evaluation device is configured to estimate the elevation angle of the objects on the basis of a contrast between the radar echoes received by the various groups. [A670]

"Misalignment processing for a vehicle radar sensor"

The present invention relates to a vehicle radar system (2) arranged to detect objects outside a vehicle (1) . The radar system (2) a radar detector (3) and a processing unit (4) . The processing unit (4) is arranged to obtain values for detected target angle (.theta..sub.err) and detected target Doppler velocity (v.sub.d) relative the radar detector (3) for each detected object (10a', 10b', 10c', 10d', 10e') during a certain time interval. If there is a zero crossing (14) for a derivative (13) of a function (12) describing the progression of detected target Doppler velocity (v.sub.d) as a function of detected target angle (.theta..sub.err) , the processing unit (4) is arranged to detect the zero crossing (14) . This zero crossing (14) is indicative of a radar system misalignment (.theta..sub.m) . The present invention also relates to a corresponding method. [A671]

"Radar apparatus"

A radar apparatus is installed in a vehicle that moves along its direction of travel. A radar transmission unit transmits a high frequency radar transmission signal from a transmit antenna in each transmit period. In a radar reception unit, antenna system processing units each generate a correlation vector by computing the correlation between reflected wave signal from a stationary object or a moving object and the radar transmission signal. A Doppler frequency-azimuth conversion unit converts Doppler frequencies into the components of an azimuth in which the stationary object is present using an estimated vehicle speed vector for the vehicle. A stationary object azimuth estimation unit generates the power profile of the reflected wave signal using the correlation vector and a direction vector corresponding to the components of the azimuth in which the stationary object is present. [A672]

"Comprehensive advanced geological detection system carried on tunnel boring machine"

The present invention presents a comprehensive advanced geological detection system carried on a tunnel boring machine. The comprehensive advanced geological detection system includes a multifunctional combination main frame, an induced polarization detection device, a seismic wave detection device, an integrated junction device, a borehole ground penetrating radar detection device and a comprehensive interpretation and decision system, the multifunctional combination main frame includes a time division multiplexing control module, an excitation source control module and a parallel data acquisition module, the excitation source control module outputs trigger signals to the three detection devices respectively, and the three detection devices respectively output measurement data and feedback signals to the time division multiplexing control module through the parallel data acquisition module, and the comprehensive interpretation and decision system supports geological interpretations and decisions through the inversion/migration imaging joint inversion of three detection methods. [A673]

"Omni-inducer transmitting devices and methods"

Omnidirectional electromagnetic signal inducer (omni-inducer) devices are disclosed. The omni-inducer device may include a housing, which may include a conductive base for coupling signals to ground, and an omnidirectional antenna node including a plurality of antenna coil assemblies, where the node may be disposed on or within the housing. The omni-inducer device may further include one or more transmitter modules for generating ones of a plurality of output signals, which may be generated at ones of a plurality of different frequencies, and one or more control circuits configured to control the transmitters and/or other circuits to selectively switch the ones of the plurality of output signals between ones of the plurality of antenna coil assemblies. [A674]

"Radar weather data signal processing method and signal processing module"

Disclosed is a radar weather data signal processing module comprising: a pulse compression unit for pulse-compressing a received weather signal, a correlation coefficient calculation unit for calculating a correlation coefficient on the basis of the pulse-compressed weather signal, and a weather variable calculation unit for calculating a weather variable on the basis of the calculated correlation coefficient. [A675]

"Apparatus for measuring circular depolarization ratios in a weather radar"

An apparatus and method for the pre and post processing of radar signals to allow for improved measuring of circular depolarization ratio data in a weather radar. The system uses a phase shifter, which is periodically calibrated to ensure proper polarity, to alter the transmission phase of one channel of a radar transmission output. Reflectivity signals are then processed in accordance with rules dependent upon the transmission phase shift to reliably extract circular depolarization ratio ("CDR") data from the reflectivity signals. CDR data is used to enhance hydrometer recognition in a weather radar system. [A676]

"Radar-transparent coating"

The invention relates to a radar-transparent component comprising a plastic body. Said component is characterized in that at least parts of the surface have a coating with a thickness of between 10 nm and 100 nm that comprises a semiconductor. Said coating gives the plastic body the desired metallic appearance without the body losing the characteristic of a radar-transparent component. [A677]

"Method for operating a distance sensor and device for performing the method"

The invention relates to a method for operating a distance sensor (10) . In the method, a transmission signal (S1) is radiated as transmission radiation (S2) , reflected as reflection radiation (S3) by an object (16) , the distance (D) of which is to be measured, and received as a reflection signal (S4) . The reflection signal (S4) present at a receiver input (28) and a reference signal likewise occurring at the receiver input (28) are controlled to a specified ratio, the distance (D) being determined during the adjusting process. The invention further relates to devices for performing the method. The method is characterized in that microwaves are used as the transmission radiation (S2) and a cross-talk signal (S5, S6) from the transmission signal (S1) directly to the receiver input (28) with suppressed radiation of the transmission signal (S1) is used as the reference signal. [A678]

"Vehicle blind spot system operation with trailer tow"

This disclosure generally relates to a vehicle blind spot detection system, method, and module for adjusting parameters of a vehicle blind spot detection algorithm based on a trailer being attached to the back of the vehicle. More specifically, based on a determination that a trailer is attached to the vehicle and the reception of trailer information corresponding to the attached trailer, an adjust to the parameters of a blind spot detection area is disclosed for ensuring the continued operation of the blind spot detection feature will take into account the attached trailer. [A679]

"Method and arrangement for determining a trajectory"

A method and an arrangement are provided for determining a trajectory for a host vehicle H in order to as smoothly as possible avoid or mitigate a collision. The arrangement may include a processor and at least one of a sensor system or a communication system. The method may include identifying positions of one or more external objects in relation to the host vehicle H within a predefined distance, generating a plurality of trajectories that are valid for enabling the host vehicle H to pass any desired number of external objects, removing any trajectories intersecting with any one of the external objects, estimating lateral position, lateral velocity, lateral acceleration and the lateral jerk that will act on the host vehicle H driving along any one of the trajectories, and selecting the trajectory for which the lateral jerk acting on the host vehicle H is minimized. [A680]

"Gen II meter system"

Apparatus for controlling and monitoring vehicle parking meter systems wherein a plurality of programmable single space parking meters enable the resetting of time upon a vehicle departure and the occurrence of any other operational parameter, multiple low power microprocessors for monitoring and initiating changes in the logic for all the devices monitoring the parking meter spaces, a plurality of specialized microprocessors for monitoring the system to assure reliable operation thereof, a master operational microprocessor connected to each of the additional low power microprocessors for monitoring of and control of any changes in the logic to establish new operating parameters for the low power microprocessors, a centralized operational controller accessible to parking personnel to monitor and control the space monitoring units from a remote location, a pass-through radio frequency communication device for passing messages from the centralized operational controller to and from each space monitoring unit by way of the internet, and a power supply comprising a rechargeable battery receiving a charge from any combination of high energy density-low current battery and/or a solar panel mounted onto the power supply. [A681]

"Angle-resolving radar sensor for motor vehicles"

An angle-resolving radar sensor for motor vehicles having multiple antenna elements and multiple receive channels, at least two antenna elements connected to the same receive channel together having a directional characteristic having at least two main lobes having different primary sensitivity directions. [A682]

"Micro-radar, micro-radar sensor nodes, networks and systems"

A micro-radar is disclosed that is operated based upon two Digital to Analog Converter (DAC) outputs that control its internal timing and Intermediate Frequency (IF) signal frequency. Calibration and temperature compensation is done through estimating the duty cycle of the transmit signal and possibly the reception signal that stimulate a pulse generator to create the transmit pulse and the reception pulse and adjusting one or both DAC outputs. Sensor processors, wireless sensor nodes and wireline sensor nodes are disclosed for operating the micro-radar. An integrated circuit is disclosed implementing all or portions of the micro-radar. Access points, servers as well as systems that include but are not limited to a traffic monitoring system, a traffic control system, a parking management system and/or a production management system are also disclosed. [A683]

"Position measurment apparatus for measuring position of mobile object on the basis of refelected wave"

A reflector apparatus includes reflectors, which respectively radiate reflected waves in predetermined polarization directions. A polarized wave information reading circuit fixed to a moving body radiates a radio wave toward the reflecting apparatus from a transmitting antenna, receives reflected waves from the reflecting apparatus, and generates a received level difference signal that corresponds to a polarization direction of the received reflected waves. A position calculating circuit calculates a position of the polarized wave information reading circuit based on the received level difference signal. [A684]

"Systems and methods for adjusting a contour of a vehicle based on a protrusion"

A system for informing a navigation system of a vehicle of a protrusion includes a sensor and a processing circuit.

The sensor is configured to generate sensor data based on a position of cargo. The processing circuit is configured to determine a contour of the vehicle, detect protruding cargo extending outside the contour of the vehicle, where detecting the protruding cargo is based on the sensor data and the contour, and notify the navigation system of the vehicle of the protruding cargo. [A685]

"Sensor system for explosive detection and removal"

A sensor system for detecting one of Improvised Explosive Devices (IEDs) , landmines or other buried explosives, the sensor system is mounted in place of a standard backhoe digging bucket of a backhoe vehicle. The sensor system includes a mounting portion having arc swing points for hanging the sensor system on a backhoe arm, and a holding pin opening for receiving a holding pin when positioned in a mounting position on the backhoe arm, and an electronic sensor wand arm assembly mounted to the mounting portion. [A686]

"Anti-sniper targeting and detection system"

An anti-sniper targeting system where a spherical omni-directional depth stereoscopic multi-lens camera, a radar (e.g., LIDAR) , and microphone identify, detect, and determine target positions and bearings, detect target weapon flash, detect glint, track bullet trajectory, coordinate, track, share, and assign targets. Target bearings and ranges are determined by sound and heat signature detection from an infrared camera, from glint, and radar to rapidly position a fire control arm with a camera onto assigned targets rapidly from calculations on target positions and optimal trajectory. It may account for firing corrections due to target range and wind effects using wind sensors, terrain data, pressure, temperature, and earth curvature accommodating for bullet trajectory over large ranges. It can be an offensive sniper system whereby a target is locked in spite of movements, such as from a vehicle using stabilizing gyros and accelerometers, image processing, or sensor data to adjust for movements. [A687]

"Collision mitigation apparatus"

A collision mitigation apparatus is provided, which is installed in a vehicle and mitigates damage to the vehicle in occurrence of a collision. The apparatus includes an activation control section which detects an object positioned around the vehicle, and activates a collision mitigation part for mitigating damage to the vehicle in occurrence of a collision if a positional relationship between the vehicle and the object meets a predetermined activation condition, a type determining section which determines type of the object, the type being any one of a vehicle, a pedestrian and a roadside object, and an activation condition changing section which consolidates the activation condition compared to a case where the type of the object is not a roadside object, if the type of the object is a roadside object. [A688]

"Collision avoidance assistance device and collision avoidance assistance method"

A collision avoidance assistance device includes an assistance execution unit configured to execute collision avoidance assistance in a case where it is determined that a vehicle will collide with an object, in which, when it is not determined whether the vehicle will collide with the object or not during execution of the automatic braking based on the collision avoidance assistance, the assistance execution unit is configured to inhibit cancellation of the automatic braking in a case where the object is present in front of the vehicle. [A689]

"Process for measuring circular depolarization ratios in a weather radar"

An apparatus and method for the pre and post processing of radar signals to allow for improved measuring of circular depolarization ratio data in a weather radar. The system uses a phase shifter, which is periodically calibrated to ensure proper polarity, to alter the transmission phase of one channel of a radar transmission output. Reflectivity signals are then processed in accordance with rules dependent upon the transmission phase shift to reliably extract circular depolarization ratio ("CDR") data from the reflectivity signals. CDR data is used to enhance hydrometer recognition in a weather radar system. [A690]

"Collision detection system and method of operation"

A system for detecting driver vehicle travelling in an unsafe manner comprising a radar system configured to generate a sequence of frames of radar data. A target trajectory system configured to receive the sequence of frames of radar data and to generate target trajectory data for a vehicle. An alarm system configured to receive the target trajectory data and to generate an alarm as a function of the target trajectory data, a probability of collision, a degree of erratic driving or other suitable data. [A691]

"Vehicle collision shield"

A method for avoiding collisions with an aircraft ground-services vehicle includes using a proximity sensor attached to the ground-services vehicle to generate a proximity signal, and using a processor that stores a three-dimensional map of the ground-services vehicle's outer geometry. The three-dimensional map is modifiable upon in-use changes to the 3-D geometry of the ground-services vehicle. The processor uses the three-dimensional map and the proximity signal to determine whether a predetermined 3-D envelope around the vehicle has been breached, and notifies the vehicle of a breach. [A692]

"Driver assistance device for a vehicle and method for operating a radar device"

The invention relates to a driver assistance device (2) for a vehicle (1) , which driver assistance device has a radar appliance (3, 4) for determining measured variable (.alpha..sub.1, .alpha..sub.2, R.sub.1, R.sub.2) referenced to an object (10) that is external to the vehicle, wherein the radar appliance (3, 4) comprises: at least a first and a second reception antenna (14, 15) , each for receiving signals (S.sub.E1, S.sub.E2) , a first down-converter (17) , which is coupled to the first reception antenna (14) via a first reception path (16) , and a second down-converter (23) , which is coupled to the second reception antenna (15) via a second reception path (21) , for down-converting the received signals (S.sub.E1, S.sub.E2) into respective baseband signals (S.sub.B1, S.sub.B2) , a control device (5) for determining the measured variable (.alpha..sub.1, .alpha..sub.2, R.sub.1, R.sub.2) using the baseband signals (S.sub.B1, S.sub.B2) , and test means (32) for producing a local check signal (S.sub.P) and for coupling the check signal (S.sub.P) into the first reception path (16) and into the second reception path (21) , as a result of which the control device (5) receives the check signal (S.sub.P) that has been down-converted by the first down-converter (17) as a first test signal (S.sub.T1) and the check signal (S.sub.P) that has been down-converted by the second down-converter (23) as a second test signal (S.sub.T2) . The control device (5) uses the test signals (S.sub.T1, S.sub.T2) to determine a frequency-dependent correction variable (.delta. (.sub.F)) for correcting the measured variable (.alpha., .alpha..sub.2, R.sub.1, R.sub.2) . The invention also relates to an appropriate method. [A693]

"Computational systems and methods for locating a mobile device"

Systems and methods are described relating to detecting an indication of a person within a specified proximity to at least one mobile device, and presenting an indication of location of the at least one mobile device at least partially based on the indication of the person within the specified proximity. Additionally, systems and methods are described relating to means for detecting an indication of a person within a specified proximity to at least one mobile device, and means for presenting an indication of location of the at least one mobile device at least partially based on the indication of the person within the specified proximity. [A694]

"Meteorological observation system using vehicles"

Disclosed herein is a meteorological observation system using vehicles. The meteorological observation system using vehicles includes a meteorological observation device embedded in each of the vehicles and configured to periodically detect surrounding weather information and to photograph weather conditions, the vehicle configured to run on a road using radar devices for detecting the front and right and left sides of the vehicle, that is, sensors for supporting driving and prevent a collision, and to provide mobility to the meteorological observation device, a meteorological server configured to collect pieces of the weather information from the meteorological observation devices moving in respective areas through wireless communication and to provide the pieces of weather information to a meteorological observation center, the meteorological observation center configured to use information, received from the meteorological server, as statistical data or meteorological observation and forecast data. [A695]

"Object recognition apparatus and vehicle"

In an object recognition apparatus or a vehicle equipped with the same, a first target area, for judging whether or not a target object is to be treated as a target of a behavior supporting action, is set as one portion of a first detection region, and a second target area, for judging whether or not the target object is to be treated as the target of the behavior supporting action, is set as one portion of a second detection region. If the position of a first peripheral object such as a radar target exists within the first target area and the position of a second peripheral object such as a camera target exists within the second target area, the target object is treated as the target of the behavior supporting action. [A696]

"Non-linear resonating sensor and a method"

Described herein is a passive wireless resonating non-linear sensor that is typically based on a ferroelectric varactor. The sensor replies its data at an intermodulation frequency when a reader device illuminates it at two closely-located frequencies. Furthermore, described herein is a general intermodulation read-out principle for passive wireless sensors. A sensor utilizes a mixing element, such as a varactor and it can be equipped with a capacitive, inductive, or resistive sensor element. When the sensor is illuminated with signals with two frequencies it replies the sensor data at an intermodulation frequency. [A697]

"Method for measuring the position of a surface of a vehicle"

A method for measuring the position of a surface of a vehicle on a roadway comprising the following steps: transmitting and receiving radar beams at transmitting and receiving positions in various primary transmitting and primary receiving directions and converting these beams into received signals, selecting the received signal having the greatest signal strength, and determining the aforementioned position from the transmitting and receiving positions and the primary transmitting and primary receiving directions of the received signal having the greatest signal strength. [A698]

"Detection apparatus and vehicle"

A detection apparatus attachable to a structure includes a transmission unit to transmit a transmission signal, a receiving unit to receive a reflection signal of the transmission signal reflected from a detection target, and a detection processing unit to detect the detection target based on the reflection signal. The structure includes a transmission translucent portion and a receiving translucent portion. The transmission signal having a given wavelength range passes through the transmission translucent portion, and the reflection signal having a given wavelength range passes through the receiving translucent portion. [A699]

"Device, system and method of determining whether a mobile device is located in an indoor location or an outdoor location"

Some demonstrative embodiments include devices, systems and/or methods of determining whether a mobile device is located in an indoor location or an outdoor location. for example, an apparatus may include a controller to control a mobile device to transmit a wireless transmission and to listen for one or more received echoes of the wireless transmission received from one or more directions. The controller may determine whether the mobile device is located in an indoor location or an outdoor location, for example, based on the received echoes. [A700]

"Sensor device"

A sensor device for monitoring the environment of a vehicle includes at least two sensors, each with a signal generator, a transmitting antenna, and at least two receiving antennas, characterized in that at least one reference clock pulse generator for generating a common reference clock pulse for the signal generators of the at least two sensors is provided. [A701]

"Collision determination device and collision determination method"

A collision determination device includes a radar detection unit that detects an object in front of a vehicle by a radar wave, an image detection unit that images in front of the vehicle and detects the object by the imaged image, and a collision determination unit that determines a collision between the vehicle and the object based on a combined target generated using a detection result of the radar detection unit and a detection result of the image detection unit. The collision determination unit performs collision determination with a speed of the object in the traveling direction of the vehicle as zero when the vehicle decelerates. [A702]

"Sensor cart positioning system and method"

A movable platform has a front end, a back end, a longitudinal axis, and at least one axle oriented generally transverse to the longitudinal axis and located between the front and back ends for supporting wheels of the platform. A position sensor is affixed on the platform at a location other than at a location defined by a plane passing through the axle and normal to the longitudinal axis. The position sensor provides position data as the platform traverses a path. A sensor arrangement is supported by the platform and configured to provide subsurface sensor data as the platform traverses the path. A processor is configured to associate the position data with the sensor data relative to a reference frame and in a manner that accounts for dynamic motion of the platform. [A703]

"Lane recognition method and system"

Disclosed herein is a method of recognizing the location of a current lane in which a vehicle is traveling, using a radar and an imaging device. The method includes: detecting the locations of the fixed objects using an object detector, capturing a photograph of the road surface ahead using an imaging device, calculating, by a controller, the entire width of a traveling road based on the locations of the fixed objects at the left side and the right side, calculating, by the controller the width of a traveling lane from the photograph of the road surface, and calculating, by the controller, the lane in which the vehicle is traveling based on the calculated width of the traveling lane and the entire width of the traveling road. [A704]

"Method of detecting oil spill at the sea by means of an oil spill radar, and such an oil spill radar"

A method for detecting oil at the sea by means of a coherent oil spill radar with a transmitter and a receiver antenna includes the transmitter and receiver antenna being directed towards a sea surface in the near area out to a given distance of 1000-4000 m under a grazing angle of between 0.5 and 30 degrees, the transmitter antenna transmits at a frequency between 2 GHz and 18 GHz, and frequency modulated with an adjustable bandwidth and with a given transmitted effect less than 10 W. The transmitter antenna has a horizontal antenna lobe smaller than its vertical antenna lob. The transmitter and receiver antenna are controlled electronically to transmit and detect vertical polarization and horizontal polarization, with an adjustable modulation time of less than 4 ms between the polarizations. [A705]

"Radar system for automated vehicle with phase change based target catagorization"

A radar system suitable for an automated vehicle includes a plurality of antennas configured to detect a reflected radar signal reflected by an object in a field-of-view of the system. Each antenna of the plurality of antennas is configured to output detected signals indicative of the reflected radar signal detected by each of the plurality of antennas. The system also includes a controller configured to receive the detected signals from the plurality of antennas, determine if the object is present in the field-of-view based on the detected signals, and determine a phase-difference between symmetrical-frequency-bins for each antenna. The symmetrical-frequency-bins are symmetrically offset from a maximum-amplitude non-coherent-integration detection-frequency-bin (max-NCI-bin) . The controller is further configured to determine a classification of the object based on a time-domain-analysis of the phase differences across the plurality of antennas. [A706]

"System and method for providing situational awareness in a vehicle"

A method and system for providing situational awareness in a vehicle. The method and system include receiving environmental sensor data and vehicle performance sensor data. The method and system also include compiling the environmental sensor data and the vehicle performance data. The method and system additionally include determining one or more situational risks that are posed to the vehicle that occur within a surrounding environment of the vehicle based on the compiled environmental sensor data and the vehicle performance data. The method and system further include generating one or more projected graphical objects that represent the one or more situational risks that are determined to be posed to the vehicle. [A707]

"Multi-surface model-based tracking"

Systems and methods for detecting a vehicle. One system includes a controller. The controller is configured to receive images from a camera mounted on a first vehicle, identify a surface of a second vehicle located around the first vehicle based on the images, and generate a three-dimensional model associated with the second vehicle. The model includes a first plane and a second plane approximately perpendicular to the first plane. The first plane of the model is associated with the identified surface of the second vehicle. The controller is further configured to track a position of the second vehicle using the three-dimensional model after the identified surface falls at least partially outside of a field-of-view of the at least one camera. [A708]

"Processing of signals to provide a delay Doppler map"

An apparatus is disclosed for processing a sequence of samples of a received signal R reflected by a target surface and having a delay and a frequency shift relative to a reference signal D to obtain a delay Doppler map for the reflected signal. A first correlation module can obtain partial correlations z (n', k) between samples corresponding to the reflected signal R and a samples corresponding to the reference signal D, across a set of delays. An inverse discrete fourier transform (DFT) of a sequence of samples can be derived from at least DFTs of a first reflected signal sequence and second reference signal sequence. [A709]

"System and method for target doppler estimation and range bias compensation using high duty cycle linear frequency modulated signals"

A method involves using an echo-ranging system to transmit a continuously repeating linear frequency modulated (LFM) signal through a propagation medium and receive a return signal reflected off of a target, performing signal processing on the return signal for processing intervals shorter in duration than the return signal waveform cycle, extracting detected echo sets from the processing intervals, estimating a time versus delay slope for each of the detected echo sets, estimating a target range-rate using the estimated time versus delay slopes, computing a bias error using the estimated target range-rate, applying timing correction to the detected echo sets to remove the bias error, and using the echo ranging system to transmit the detected echo set to a target tracker system. [A710]

"Robust attenuation correction system for radar reflectivity and differential reflectivity"

Embodiments of the invention are directed toward attenuation correction of radar data. Atmospheric attenuation is a function of atmospheric water drop size and temperature. A number of different theoretical models are available to mathematically describe the particle drop shape that influences attenuation estimation. Each of these models has proven effective in different scenarios. It can be difficult, however, to predict which theoretical model to use. The total differential phase gives an idea of the attenuation, but it depends on the model. Moreover, the total attenuation along a rain path must be apportioned to different parts of the radar path in order to correct for attenuation along a radar path. Embodiments of this invention allows for a system to apportion the attenuation to different parts of the radar beam. Embodiments of the invention also allow for optimization of a number of different theoretical models for both drop size and temperature. [A711]

"V2V communication-based vehicle identification apparatus and identification method thereof"

Disclosed herein are a vehicle-to-vehicle (V2V) communication-based vehicle identification apparatus and an identification method thereof. The V2V communication-based vehicle identification apparatus includes a radar sensor unit sensing radar information corresponding to relative distances to object vehicles, a GPS module unit generating GPS information from GPS satellites, a V2V communication unit transmitting the generated GPS information to the object vehicles and receiving GPS information of the object vehicles from the object vehicles through vehicle to vehicle (V2V) communication, and a controller calculating probabilities that the GPS information of the object vehicles will be located at areas, set based on the sensed radar information, and identifying vehicles corresponding to the radar information and the GPS information of the object vehicles based on the calculated probabilities. [A712]

"Method and system for target detection"

A method of detecting a physical target in a region-of-interest is disclosed. The method comprises: transmitting a pulse of radiation into the region-of-interest, receiving an echo signal from the region-of-interest, accessing a computer readable medium storing a dictionary defined over a plurality of dictionary atoms each describing a dictionary function corresponding to at least a time delay and a Doppler shift, calculating a coefficient for each dictionary function using the echo signal, thereby providing a plurality of coefficients, wherein a linear combination of all dictionary functions respectively weighted by the coefficients does not reconstruct the echo signal, and determining at least one of a range and a speed of the target based on the coefficients. [A713]

"Driver assistance system for a vehicle"

A driver assistance system for a vehicle includes a forward facing camera and a control comprising an image processor that processes image data captured by the forward facing camera. The control receives vehicle data relating to the vehicle, including vehicle speed and vehicle steering angle, via a vehicle bus of the vehicle. Via processing by the image processor of image data captured by the forward facing camera, the control is operable to detect a road marking on the road being traveled by the vehicle and to the left of the vehicle. Responsive at least in part to processing of captured image data by the image processor, the control determines a driving condition of the vehicle, such as the type of lane markers present ahead of the vehicle, a traffic condition at or ahead of the vehicle, and/or a hazardous condition at or ahead of the vehicle. [A714]

"Stop sign intersection decision system"

An intersection decision system for autonomously navigating an autonomous vehicle through a stop sign intersection. The intersection decision system includes an intersection arrival detector configured to automatically detect that the vehicle has arrived at the stop sign intersection, a vehicle detector for automatically detecting previously-arrived vehicles at the stop sign intersection, and a pedestrian detector for automatically detecting pedestrians crossing at the stop sign intersection. The intersection decision system determines whether the detected pedestrians are obstructing the previously-arrived vehicles from proceeding through the stop sign intersection. If so, the intersection decision system determines that the autonomous vehicle should proceed through the stop sign intersection without waiting for the previously-arrived vehicles to proceed through the stop sign intersection. [A715]

"Derivative imaging for subsurface object detection"

A series of scans is generated for a subsurface and a derivative image is created using the series of subsurface images. One or more tests are performed on the derivative image, and a subsurface object is detected based on the one or more tests. A sensor is configured to generate a series of scans for a subsurface and a processor is coupled to the sensor. The processor is configured to execute stored program instructions that cause the processor to generate a series of images of the subsurface using the series of scans, create a derivative image using the series of subsurface images, perform one or more tests on the derivative image, and detect a subsurface object based on the one or more tests. [A716]

"Millimeter wave radar system for and method of weather detection"

A system and method relates to a weather detection system using millimeter wave radar data. Processing electronics receives millimeter wave radar (MMWR) data and senses a presence of weather spatial extent using return strength data associated with the MMWR data. The processing electronics uses spectral width data associated with the MMWR data to assign a level to the weather in the spatial extent. [A717]

"Ship position and velocity using satellite ephemerides and radar range measurement of satellite"

There may be situations in which a ship at sea is lost and GPS is not available due to jamming, and neither a position fix nor GPS is available. A system and method allow estimation of ship position (SPOS) using only single radar range measurements and satellite ephemeris data. The same radar can determine ship velocity using radar range rate information. [A718]

"Method and system for a head unit application host for a radar detector"

A vehicle computer system comprises one or more transceivers in communication with a radar-detector and an off-board server. The vehicle computer system further comprises a processor in the vehicle computer system in communication with the one or more transceivers. The processor is configured to receive a message from the radar-detector that includes information related to an alert, send data to the off-board server utilizing the one or more transceivers, the data including information related to the alert, and output at the VCS a notification based upon the message received from the radar-detector. [A719]

"Methods and systems for enhanced round trip time (RTT) exchange"

Disclosed are systems, methods and devices for obtaining round trip time measurements for use in location based services. In particular implementations, a fine timing measurement request message wirelessly transmitted by a first transceiver device to a second transceiver device may permit additional processing features in computing or applying a signal round trip time measurement. Such a signal round trip time measurement may be used in positioning operations. [A720]

"Collision possibility determination apparatus, drive assist apparatus, collision possibility determination method, and collision possibility determination program"

A collision possibility determination apparatus includes: an identifying part configured to detect an object and identify a location of the object, a first analysis part configured to predict a future location of the object based on information relating to the object output from the identifying part and generate first information indicating a possibility of colliding with the object based on the predicted future location of the object, a second analysis part configured to generate second information indicating a possibility of colliding with the object based on the location of the object identified by the identifying part, and a determination part configured to determine a possibility of colliding with the object based on both of the first information and the second information. [A721]

"Device and vehicle with tilt compensation for an environment sensor"

A device for a vehicle, particularly a motor vehicle, includes an environment sensor system which has at least one environment sensor for contactlessly detecting at least one environment region, means for adjusting the environment region to be detected, and a device for determining the environment region to be detected. The device has a position sensor which detects the tilting of the vehicle in respect of a vehicle base, and the means adjust the environment region to be detected depending on the tilt of the vehicle. [A722]

"Driver assistance system for a vehicle"

A driver assistance system for a vehicle for monitoring cross-traffic includes a transmitting device for transmitting electromagnetic signals and operable for monitoring a kidney-shaped area in both a first monitoring direction and in a second monitoring direction and a receiving device for receiving electromagnetic signals. [A723]

"System and method for tornado prediction and detection"

The presently disclosed inventive concepts are directed, in at least one non-limiting embodiment, to a computer system and method for issuing a tornado-indicative notification, such as a warning. In one embodiment the method includes receiving time sequential radar reflectivity data from an area undergoing a weather event, via at least one computer port and at least one processor executing processor executable code, analyzing the radar reflectivity data of the area to determine if an entropic source and an entropic sink are present in the area, determining a distance between the entropic source and the entropic sink when the entropic source and the entropic sink are present in the area, and outputting a tornado-indicative notification for the area when the distance between the entropic source and the entropic sink is less than or equal to a predetermined distance. [A724]

"Device and method for displaying ship perimeter information"

A ship perimeter information display device is provided. The device includes a sensor information input unit connected with a sensor equipped in a first ship and for receiving an input of a detection result of the sensor, an AIS information input unit for receiving an input of VDO information that is a VHF data link own-ship message contained in AIS information transmitted from the first ship to a second ship, a display unit for displaying a situational image illustrating a situation around the first ship, and a control unit for displaying, on the display unit, information indicating a difference between first state information of the first ship obtained based on the detection result of the sensor and second state information of the first ship obtained based on the VDO information. [A725]

"Detecting radar blockage based on drive history"

A vehicle includes a radar sensor for detecting objects in the vehicle path. The radar sensor may become blocked by contaminants or debris. A controller monitoring the radar system may detect a radar blockage when a return signal magnitude is less than a threshold. A typical response may be to set a radar blockage diagnostic under such a condition. The controller may inhibit setting a radar blockage diagnostic when other data indicates that the radar sensor is not blocked. Data such as vehicle position, traffic information, camera images, and historical radar returns may be used. A controller may confirm a radar blockage diagnostic when other data indicates that the radar sensor may be blocked. Data such as temperature, vehicle position, surface roughness, automated brake interventions, and heating system status may be used. Return signal dependent functions may be operated based on the radar blockage diagnostic. [A726]

"TDR fluid level sensor"

A system and method for accurately measuring fluid level in a vessel is provided. Generally, the system contains an elongated portion being a coaxial tube having a hollow center, an arm being coaxial in shape, and a sensor containing a transmitter capable of creating and transmitting an excitation electromagnetic pulse for traversing the elongated portion and the arm, and a receiver for receiving reflected pulses, wherein a proximate end of the elongated portion joins a distal end of the arm in a manner to create a waveguide for an electromagnetic pulse provided by the sensor. [A727]

"Athletic performance monitoring systems and methods in a team sports environment"

Systems, apparatuses, and methods estimate the distance between a player and a ball by transmitting a chirp (sweep signal) to a radio tag located on the ball. During the chirp, the frequency of the transmitted signal is changed in a predetermined fashion. The radio tag doubles the transmitted frequency and returns the processed signal to a transceiver typically located on the player. The currently transmitted frequency is then compared with the received frequency to obtain a difference frequency from which an apparatus may estimate the distance. The apparatus may simultaneously receive the processed signal from the radio tag while transmitting the sweep signal. [A728]

"Surface scattering antenna array"

An array of scattering and/or reflector antennas are configured to produce a series of beam patterns, where in some embodiments the scattering antenna and/or the reflector antenna includes complementary metamaterial elements. In some embodiments control circuitry is operably connected to the array to produce an image of an object in the beam pattern. [A729]

"Ground moving target indicator (GMTI) radar that converts radar tracks to directed graphs (DG) , and creates weighted DGs aligned with superimposed with digital maps"

The present invention is directed to a system that includes a semantic reasoning engine that is configured to convert radar track data into a directed graph representation (DGR) of the predetermined surveillance region and iteratively combine the DGRs to create a weighted directed graph (WDG) aligned and superimposed with the digital map data. The WDG includes first WDG elements corresponding to moving objects detected by a radar system. The WDG is compared to historical data to obtain a surveillance detection parameter. An alarm message is generated if the surveillance detection parameter deviates from the historical data by a predetermined amount. An output device is coupled to the semantic reasoning engine and is configured to provide a representation of the digital map data, the WDG and the at least one alarm message. [A730]

"Signal-based data compression"

Aspects of the present disclosure are directed to apparatuses and methods involving the detection of signal characteristics. As may be implemented in accordance with one or more embodiments, an apparatus includes a radar or sonar transceiver that transmits signals and receives reflections of the transmitted signals. A data compression circuit determines a compression factor based on characteristics of the signals, such as may relate to a channel over which the signal passes and/or related aspects of an object from which the signals are reflected (e.g., velocity, trajectory and distance) . Data representing the signals is compressed as a function of the determined compression factor. [A731]

"Arrangement to measure the deflection of a blade of a wind turbine"

An arrangement to measure deflection of a blade of a wind turbine is provided. A transmitter is arranged close to the tip end of the blade, while a receiver is arranged close to the root end of the blade. The transmitter and receiver are prepared for a wireless transfer of a monitoring signal, which is sent from the transmitter to the receiver. A monitoring system is arranged close to the root end of the blade. The monitoring system is adapted to generate the monitoring signal. The monitoring system is connected with the transmitter by a cable-bound communication line, thus the monitoring signal is transferred from the monitoring system to the transmitter. The monitoring system is connected with the receiver, thus the monitoring signal is transferred from the receiver to the monitoring system. The monitoring system is adapted to determine the deflection of the blade based on the transferred monitoring signal. [A732]

"Proximity sensing using EHF signals"

A system for sensing proximity using EHF signals may include a communication circuit configured to transmit via a transducer an EM signal at an EHF frequency, and a proximity sensing circuit configured to sense a nearby transducer field-modifying object by detecting characteristics of a signal within the communication circuit. A system for determining distance using EHF signals may include a detecting circuit coupled to a transmitting communication circuit and a receiving communication circuit, both communication circuits being mounted on a first surface. The transmitting communication circuit may transmit a signal toward a second surface, and the receiving communication circuit may receive a signal relayed from the second surface. The detecting circuit may determine distance between the first surface and a second surface based on propagation characteristics of the signals. [A733]

"Docking and undocking mechanism for remote devices"

Apparatus, system and method for docking and/or undocking a remote device, A docking body includes a docking cavity and an access cavity, for providing lateral support, guidance and access for the remote device. Communications is configured to receive a control signal based on a sensed condition, wherein the sensed condition may include a proximity and/or position of a user's hand relative to the docking body, and/or an operating parameter of a vehicle. A coupling apparatus is provided for magnetically coupling the body of the remote device to at least a portion of the docking body. The coupling apparatus may be configured to modify the strength of the magnetic coupling based on the control signal to assist in insertion/removal. Under illustrative configurations, the docking body and the coupling apparatus allow for oblique insertion and oblique removal of the body of the remote device. [A734]

"Method and apparatus for location determination using reflected interferometry"

A system (200) and method (400) for determining the location of an object is provided. A plurality of radio transceivers (101,201,203,205) are disposed about a location of interest (221) . One or more tags (102) are coupled to an object. The radio transceivers (101,201,203,205) transmit radio frequency signals (115,215,217,219) to the tag (102) , which backscatters a return signal (116,216,218,220) having a unique identifier modulated therein due to a switch (108) switching between two or more loads (110,112) in accordance with a unique identification code (118) . A location determination module (107) then determines the location of the tag (102) by using a course location estimate (502) , a fine location estimate (503) , or combinations thereof. A object modeling module (109) can create multidimensional models using the locations of the tags (102) . [A735]

"Multichannel UWB-based radar life detector and positioning method thereof"

A multichannel UWB-based radar life detector includes a transmitting antenna and three receiving antennas for forming three radar echo signal channels. A 2-dimensional positioning method thereof includes: a1) amplifying weak life signals of stationary human by the channels, providing an 8-point integration method with an interval of 4 points to radar echo signals by distance, then breaking the integrated signals for decomposition and reconstruction in such a manner that target echo signals and three distance signals are formed, providing digital filtering and differential to the target echo signals for amplifying the weak but useful life signals, a2) 1-dimensionally distinguishing the signals by distance, analyzing spatial frequency according to the filtered and differentiated target echo signals as well as the distance signals for obtaining three target projection signals in the three channels, and a3) identifying the 2-dimensional position information of the targets according to the projection signals, forming an image. [A736]

"Negative pseudo-range processing with multi-static FMCW radars"

A multi-static radar system for monitoring water surface targets is provided. The multi-static radar system may include a first and second radar, a state machine, and a signal processor. The radars may be located in separate locations and synchronized using timing signals. The state machine may be configured to determine, using the timing signals, start times and end times of radio frequency signal modulations for each radar. A concept of negative pseudo-range is provided, whereby the modulation start times are configured to allow pseudo-negative time delays at as many as half of the radar receivers, thereby doubling the multi-static echo detections. The signal processor may be configured to simultaneously receive and process the echoes of the radar signals received at the radars to determine position and velocity vectors for the monitored water surface targets. [A737]

"Method for generating M demodulation signals using at least one primary interferometer"

A method for generating M demodulation signals is disclosed. In one aspect, the method includes: providing M input signals, injecting each input signal into at least one first interferometer, and detecting M demodulation signals. The method also includes choosing M positive integers that are not all equal to zero and computing M demodulation signals. The i.sup.th demodulation signal being the product of R.sub.i+1 functions, R.sub.i being the chosen integer that corresponds to the first delay of the i.sup.th first interferometer, and the p.sup.th function being equal to S.sub.t,p (t) =S (t=p.tau..sub.i) , where p is an integer between 0 and R.sub.i, .tau..sub.i is the first delay introduced by the delay line of the i.sup.th first interferometer, and S is a transform of the signal at the output of the i.sup.th first interferometer. [A738]

"Vehicle safety apparatus"

When a pedestrian or the like in an area that is ahead in the direction of movement of a vehicle travelling on a road and is adjacent to the road is moving in an direction to cross the road, a system ECU varies the time of execution of a safety operation for ensuring the safety of the pedestrian in accordance with a road condition in the area where the pedestrian or the like is present. Specifically, the time of execution of the safety operation is delayed in the order of a first road condition, in which the area in which the pedestrian is present is not in a roadway, a second road condition, in which the area is in a roadway and not in an opposing traffic lane, and a third road condition, in which the area is in a roadway and in an opposing traffic lane. [A739]

"Systems and apparatus for the light-based communication of service orders and personal objects identification"

Light-based systems for communicating information associated with service orders and/or the identification of personal objects are disclosed. A personal mobile electronic communication device is used in conjunction with a communication network and a lighting controller to communicate service orders by lighting with one or more individually controllable luminaires in a lighting network. A personal mobile electronic communication device is, alternatively or additionally, used in conjunction with a communication network, and a lighting controller controlling an illumination proximate to the personal mobile electronic communication device such that the illumination proximate to the personal mobile electronic communication device visually indicates the service order. [A740]

"Simple and precise radio frequency locating system and method"

Disclosed are a radio frequency locating system and method, which efficiently solve the problem of precise locating a moving target tag in a complex environment by using a method where location information is provided for a mobile tag by using low-cost fixed active RFID tags in place of a plurality of readers requiring network connection, and the location information of the mobile tag is directly transferred to a reader at the center of a locating area from a long distance by using a mobile or fixed location tag. The present invention uses a long-distance coordinator and clock information in a transmission instruction to coordinate and schedule communication time between the mobile tag and the location tag, thereby ensuring a super long battery life of the mobile tag and the location tag. [A741]

"Road-terrain detection method and system for driver assistance systems"

The present invention describes a road terrain detection system that comprises a method for classifying selected locations in the environment of a vehicle based on sensory input signals such as pixel values of a camera image. The method comprises a high level spatial feature generation for selected locations in the environment called base points. The spatial feature generation of the base points is based on a value-continuous confidence representation that captures visual and physical properties of the environment, generated by so called base classifiers operating on raw sensory data. Consequently, the road terrain detection incorporates both local properties of sensor data and their spatial relationship in a two-step feature extraction process. [A742]

"Alert display device and alert display method"

Disclosed is an alert display device which highlights a display image for highlighting an object to be alerted in an actual scene in front of a driver of a vehicle or around the vehicle in a superimposing manner. The object to be alerted in front of the vehicle or around the vehicle is detected by a detection unit, and the display image for highlighting the object to be alerted in the actual scene in front of the driver of the vehicle or around the vehicle is displayed in a superimposing manner. At this time, the size of the display image is adjusted based on the position of the object to be alerted detected by the detection unit or/and a range in which the eyes of the driver are likely to be present. [A743]

"Sensor-aided vehicle positioning system"

A method and system for localizing a vehicle in a digital map includes generating GPS coordinates of the vehicle on the traveled road and retrieving from a database a digital map of a region traveled by the vehicle based on the location of the GPS coordinates. The digital map includes a geographic mapping of a traveled road and registered roadside objects. The registered roadside objects are positionally identified in the digital map by longitudinal and lateral coordinates. Roadside objects in the region traveled are sensed by the vehicle. The sensed roadside objects are identified on the digital map. A vehicle position on the traveled road is determined utilizing coordinates of the sensed roadside objects identified in the digital map. The position of the vehicle is localized in the road as a function of the GPS coordinates and the determined vehicle position utilizing the coordinates of the sensed roadside objects. [A744]

"Fusion of obstacle detection using radar and camera"

A vehicle obstacle detection system includes an imaging system for capturing objects in a field of view and a radar device for sensing objects in a substantially same field of view. The substantially same field of view is partitioned into an occupancy grid having a plurality of observation cells. A fusion module receives radar data from the radar device and imaging data from the imaging system. The fusion module projects the occupancy grid and associated radar data onto the captured image. The fusion module extracts features from each corresponding cell using sensor data from the radar device and imaging data from the imaging system. A primary classifier determines whether an extracted feature extracted from a respective observation cell is an obstacle. [A745]

"Radar apparatus and computer-readable storage medium"

A radar apparatus includes a detection unit to detect objects within a scan range based on a reflected wave received with respect to a transmission wave and to output detection results of the objects, and an adjusting unit to narrow the scan range so as not to detect an object other than a target object, when the detection results include the object other than the target object detected in the scan range within a predetermined time. The adjusting unit judges an object having a velocity less than a first value as the object other than the target object. [A746]

"Athletic performance monitoring systems and methods in a team sports environment"

Systems, apparatuses, and methods estimate the distance between a player and a ball by transmitting a chirp (sweep signal) to a radio tag located on the ball. During the chirp, the frequency of the transmitted signal is changed in a predetermined fashion. The radio tag doubles the transmitted frequency and returns the processed signal to a transceiver typically located on the player. The currently transmitted frequency is then compared with the received frequency to obtain a difference frequency from which an apparatus may estimate the distance. The apparatus may simultaneously receive the processed signal from the radio tag while transmitting the sweep signal. [A747]

"Vehicle control system, specific object determination device, specific object determination method, and non-transitory storage medium storing specific object determination program"

A vehicle control system includes: an anti-collision safety control unit executing anti-collision safety control for avoiding or alleviating a collision with an object including a reflection point on the basis of positional information about the reflection point, output from a positional information output unit, and a cancellation unit calculating an index value that increases with a duration of a state where a variation in a position of the reflection point in a direction perpendicular to a vehicle travelling direction is smaller than a predetermined amount and that, when the index value exceeds a threshold, issues a command such that the anti-collision safety control unit does not execute anti-collision safety control over the reflection point. When it is determined that the vehicle is travelling near a curve entrance, the cancellation unit increases the threshold as compared with when it is determined that the vehicle is not travelling near a curve entrance. [A748]

"Control system for travel in a platoon"

The present invention relates to a control system for travel in a platoon (1) , the platoon comprising a lead vehicle (L) and one or more following vehicles (F.sub.1, F.sub.2, . . ., F.sub.i-1, F.sub.i, . . ., F.sub.n) automatically following the lead vehicle, the lead vehicle controlling the movement of the following vehicles, each of the following vehicles and the lead vehicle comprising communication means (10, 12) , wherein the control system comprises a common time base, which allows a control command proposing an action to be communicated from the lead vehicle (L) to at least one of the following vehicles (F.sub.1, F.sub.2, . . ., F.sub.i-1, F.sub.i, . . ., F.sub.n) in advance of a control point (t.sub.c) . The invention further relates to the use of a common time base in a platoon and to a method to control travelling in a platoon. [A749]

"Use of motion data in the processing of automotive radar image processing"

In an example method, a vehicle configured to operate in an autonomous mode could have a radar system used to aid in vehicle guidance. The method could include a plurality of antennas configured to transmit and receive electromagnetic signals. The method may also include a one or more sensors configured to measure a movement of the vehicle. A portion of the method may be performed by a processor configured to: i) determine adjustments based on the movement of the vehicle, ii) calculate distance and direction information for received electromagnetic signals, and iii) recover distance and direction information for received electromagnetic signals with the adjustments applied. The processor may be further configured to adjust the movement of the autonomous vehicle based on the distance and direction information with adjustments applied. [A750]

"Obstacle map reconstruction system and method"

A method for obstacle detection, the method may include receiving or generating, by a computerized system, detection information about input radio frequency (RF) signals detected by a RF receiver as a result of a transmission of RF output signals towards a space that comprises potential obstacles, and detecting, by the computerized system, obstacles by associating agent behaviors with clusters of input RF signals. [A751]

"Lighting device with microwave detection function"

A lighting device includes a microwave sensor for adjusting its sensing range based on a range gate selected from multiple range gates. An active antenna module transmits first FMCW signal toward a target based on the selected range gate and for receiving second FMCW signal reflected from the target. The microwave sensor demodulates the first FMCW signal and the second FMCW signal to generate beat frequency signal. Then another demodulator demodulates the beat frequency signal to generate Doppler signal. The microwave sensor calculates a range between the microwave sensor and the target based on the beat frequency signal, calculates velocity of the target according to frequency of the Doppler signal, and determine whether to generate triggering signal according to the calculated velocity and the calculated range, when the object located within the range gate. The power module enables a lamp based on the triggering signal. [A752]

"Antenna assembly for piston accumulators"

A replaceable antenna assembly for use with a piston accumulator configured for supplying fluid to a hydraulic cylinder is provided. The antenna assembly includes a hollow manifold for flow of fluid and an antenna connected into or onto the manifold for emitting and receiving electromagnetic waves. The hollow manifold is connectable to and configured to be in fluid communication with both the piston accumulator at one end and a pressure line at the other end. The pressure line is connectable to an external high pressure gas bank. The antenna assembly further includes at least one first bore for transferring signals to and from the antenna and at least two fluid channels symmetrically displaced around the circumference of the antenna, thereby ensuring that most of, or all, fluid flows on the radial outside of the antenna during use. [A753]

"Position and/or distance measurement, parking and/or vehicle detection, apparatus, networks, operations and/or systems"

The following are disclosed: Vehicle parking detection, sensors and an On-Board Device (OBD) to create a parking session. Radars, microwave antennas, rechargeable power supplies and their power management circuits. A localized communications protocol between the wireless nodes and repeaters within a wireless network is disclosed. Wireless sensors and wireline sensors. The networks and/or systems may support parking spot management/monitoring, vehicle traffic analysis and/or management of stationary and/or moving vehicles, monitor storage areas and/or manage production facilities. These networks and/or systems may be operated to generate reports of incorrectly parked vehicles, such as reserved parking spots for other vehicles, vehicles parked in multiple parking spots and/or overstaying the time they are permitted to park. [A754]

"Measurement of charge bank level in a metallurgical furnace"

Various systems and methods for monitoring the level of a feed material layer in a metallurgical furnace are described. At least one non-contact sensor is used to sense a distance between the feed layer and a reference position. A process controller linked to the sensor provides a control signal based upon the sensed distance. The control signal may be used to control various factors in the operation of the metallurgical furnace. [A755]

"Measurement of charge bank level in a metallurgical furnace"

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"Game device that generates a display with a simulated body image and methods for use therewith"

A game device includes a first receiver that receives body motion signals from a plurality of remote motion sensing device coupled to a user's body. A user data generation module generates simulated body image data. A processor executes a game application that generates display signals for display on a display device, wherein the display signals are generated based on the simulated body image data. [A757]

"Method and arrangement for detecting traffic violations in a traffic light zone through rear end measurement by a radar device"

The invention is directed to a method and an arrangement for detecting a traffic violation in a traffic light zone through rear end measurement by a FMCW radar device. for this purpose, a vehicle driving through a radar beam of a FMCW radar device, whose first outer edge beam horizontally forms an obtuse angle with the roadway edge, is measured at its front end, flank and rear end. The vehicle length is determined from the obtained measurement signals and added to the specific radial distance of the vehicle, which is determined close to a stop line through the vehicle rear, and a prediction is made based on the vehicle speed about the vehicle front driving over the stop line. [A758]

"Device and method for displaying objects in the surroundings of a vehicle"

The invention relates to a device and a method for displaying objects in the surroundings of a vehicle having a sensor arrangement, in order to sense objects in the surroundings of the vehicle and to determine the position thereof relative to the vehicle, wherein the sensor arrangement covers, with its detection range, only a partial area of the surroundings of the vehicle, in order to improve the assistance provided to the driver during parking processes and the processes of removing a vehicle from a parking space, the processing device is designed to determine the area of the surroundings of the vehicle for which no object information is yet available, since said area has not yet been passed over by the detection range of the sensor arrangement, and the display device is designed to display the extent of this area. [A759]

"Vehicle control apparatus including an obstacle detection device"

A vehicle control device basically includes a first risk computation unit, a second risk computing unit and a first risk adjustment unit. The first risk computation unit calculates a first risk with respect to a nearby obstacle located in a nearby detection region near a host vehicle. The second risk computing unit calculates a second risk with respect to a remote obstacle located further from the nearby detection region. The first risk adjustment unit adjusts at least one of the first and the second risks to preferentially execute a warning or vehicle control based on one of the first risk or the second risk versus a warning or vehicle control based on the other of the first risk or the second risk based on an entry state of the host vehicle of entering a planned parking place, or an exit state of the host vehicle of exiting from a parking place. [A760]

"Working vehicle perimeter monitoring system and working vehicle"

A working vehicle perimeter monitoring system includes: a plurality of object detecting devices which are attached to a working vehicle and detect an object existing in a periphery of the working vehicle, and a controller which enables or disables of a generation of an alarm notifying an existence of the object based on a detection value of the object detecting device and a predetermined threshold value and sets the predetermined threshold value to be different inside and outside a predetermined region set in the periphery of the working vehicle based on an operation range of the working vehicle. [A761]

"Synchronization of a real-time UWB locating system"

In a UWB real time locating system, UWB readers (12) are synchronized by adjusting a clock of a UWB slave reader (12) until the UWB reader (12) receives each UWB pulse (34) of a sequence of UWB pulses (34) having a predetermined pulse period (Tp) and encoding a master UWB reader unique identifier at an expected time slot (35) within each predetermined pulse period (Tp) , the expected time slot (35) being related to the distance between the UWB tag reader (12) and a master UWB reader (12) . [A762]

"Device and method for generating and evaluating ultrasound signals, particularly for determining the distance of a vehicle from an obstacle"

In the device and method for generating and evaluating ultrasound signals, particularly for determining the distance of a vehicle from an obstacle, an ultrasound received signal is received by at least one ultrasound receiver subscriber of a data bus, after a burst transmission signal comprising a plurality of ultrasound pulses and having a burst length has been transmitted by at least one ultrasound transmitter subscriber of the data bus. The ultrasound received signal is subdivided into time sections which are substantially equal to half the burst length. The peak value for each time section of the ultrasound received signal is transmitted via the data bus to a central control and evaluation unit. On the basis of the peak values of the received signal for each time section, taking into account threshold value tracking, it is determined in the control and evaluation unit whether the ultrasound received signal has time sections in which the ultrasound received signal is greater than the tracked threshold value or equal to the tracked threshold value. [A763]

"Multi-sensor compressive imaging"

Multi-sensor compressive imaging systems can include an imaging component (such an RF, microwave, or mmW metamaterial surface antenna) and an auxiliary sensing component (such as an EO/IR sensor) . In some approaches, the auxiliary sensing component includes a structured light sensor configured to identify the location or posture of an imaging target within a field of view of the imaging component. In some approaches, a reconstructed RF, microwave, or mmW image may be combined with a visual image of a region of interest to provide a multi-spectral representation of the region of interest. [A764]

"Systems, methods, and apparatus for detection of metal objects in a predetermined space"

This disclosure provides systems, methods and apparatus for detecting foreign objects. In one aspect an apparatus for detecting a presence of an object in a magnetic field is provided. The apparatus includes a power circuit configured to generate the magnetic field and transfer power wirelessly at a level sufficient to power or charge a load via the magnetic field. The apparatus further includes a detection circuit configured to transmit signals and detect, based on a reflection of the transmitted signals, a frequency of vibration of the object caused by the magnetic field. [A765]

"Detection device for vehicle, abnormality detection method, and abnormality detection program"

The present invention relates to a detection device 100 for a vehicle, which can prevent damage to the vehicle by detecting occurrence of abnormality before the vehicle is damaged, and can accurately detect abnormality inside and outside the vehicle. The detection device 100 for a vehicle of the present invention includes: a transmission antenna 1, installed inside a vehicle 50, for transmitting a radio wave, reception antennae 2, 3, 4, and 5, installed inside the vehicle 50, for receiving the radio wave, and an abnormality detection calculation section 6 that calculates a spatial feature amount P (t) based on the radio wave received by each of the reception antennae 2, 3, 4, and 5, and detects, based on the calculated spatial feature amount P (t) , a motion of a person outside the vehicle 50 and a motion of a person intruding into the vehicle 50. [A766]

"Mobile radar and visual tracking coordinate transformation"

A system for generating video data comprising a mobile radar system operating on a processor and configured to generate vertically tilted radar frame data for a plurality of vehicles. A mobile video system operating on a processor and configured to generate video data of the plurality of vehicles. A dynamic plane rotation system operating on a processor and coupled to the mobile radar system and configured to map the vertically tilted radar frame data onto a flat plane parallel to a roadway to generate mapped data. [A767]

"System for interrogating a remotely interrogatable passive sensor integrated into a metal cavity with reduced system loss and interrogation method"

A system comprises a cavity being reflecting for RF waves and comprises at least one acoustic wave sensor exhibiting a resonance frequency band, coupled to a sensor antenna, and an interrogation/reception device for the sensor. The interrogation/reception device comprises: means for transmitting/receiving an RF signal transmitting within an interrogation frequency band comprising the resonance frequency band of the sensor, at least a first transmission/reception antenna and a second transmission antenna/reception, positioned within the cavity, means for dividing the signal into at least a first RF signal and a second RF signal, the first signal being transmitted to the first transmission/reception antenna and the second signal being transmitted to the second transmission/reception antenna, means for creating a phase-shift between the first RF signal and the second RF signal, means for analysing the power level of the received signal. An interrogation method used in the system is also provided. [A768]

"Proximity detection systems and methods"

A proximity detection system at least one processor. The processor configured to detect a location of an object, determine a velocity of the object, define a zone around the object based on the location and the velocity, and automatically perform at least one action if the zone around the object overlaps with a location of a piece of equipment. [A769]

"Athletic performance monitoring systems and methods in a team sports environment"

Systems, apparatuses, and methods estimate the distance between a player and a ball by transmitting a chirp (sweep signal) to a radio tag located on the ball. During the chirp, the frequency of the transmitted signal is changed in a predetermined fashion. The radio tag doubles the transmitted frequency and returns the processed signal to a transceiver typically located on the player. The currently transmitted frequency is then compared with the received frequency to obtain a difference frequency from which an apparatus may estimate the distance. The apparatus may simultaneously receive the processed signal from the radio tag while transmitting the sweep signal. [A770]

"Moving multi-polarization multi-transmitter/receiver ground penetrating radar system and signal processing for buried target detection"

A moving ground penetrating radar is comprised of multiple transmitters and receivers with multiple, e.g., Horizontal and Vertical, polarizations to detect buried targets with standoff capability. Novel signal and imaging techniques are used to form high quality radar imagery with low artifacts that are due to various sources of self-induced resonances, e.g., transmitter-receiver coupling, calibration errors, and motion errors in the multi transmitter/receiver channels of the radar system. The irradiated target area image is formed via exploiting both the spatial diversity of the physical multi-transmitter and multi-receiver array and synthetic aperture/array that is generated by the motion of the platform that carries the radar system. The images that are formed from the multiple polarizations are combined to remove surface targets/clutter and, thus, enhance signatures of buried targets. [A771]

"Feature in antenna pattern for pointing and orientation determination"

Systems and methods for antenna pointing are disclosed. A transmit antenna system having an adjustable boresight transmits a signal exhibiting a far-field pattern including a feature (e.g. a V-Notch) in a polarization of the signal disposed at a fixed position off a beam peak of the far-field pattern of the signal. A receive antenna system scans across the far-field pattern of the signal in the polarization to locate the feature and determine a pointing error of the adjustable boresight therefrom. The system may be applied to a cross-polarization of the signal where a co-polarization of the signal is simultaneously used for telecommunication. [A772]

"Vehicle-installation intersection judgment apparatus and program"

A vehicle-installation intersection judgment apparatus determines whether a target object such as a pedestrian is located ahead and to one side of the vehicle, and if so, judges whether the object is moving laterally to intersect with the advancement of the vehicle. Successive amounts of lateral displacement of the object are periodically derived, each amount is compared with a displacement threshold, a count is made of the number of times that the displacement threshold is exceeded, and the count is compared with a predetermined count threshold. The judgment concerning the target object is made based upon whether the count threshold is attained. [A773]

"Movable body display device and movable body display method"

A movable body display device includes an acquisition component, a memory component, an input component, a length adjuster, and a display controller. The acquisition component acquires position and speed of a movable body. The memory component stores a plurality of display ranges, a number of range rings for each display range, and a reference speed. The input component receives input designating one of the display ranges. The length adjuster adjusts length of a speed vector on a screen such that length of a speed vector indicating the reference speed on the screen is the same as a spacing of the range rings on the screen based on the display range. The display controller displays the movable body on the screen according to the position, and displays adjacent to the movable body a speed vector for which heading and length have been set based on the length and the speed. [A774]

"Location measurments using a mesh of wireless tags"

A method for determining a location of a group of wireless tags, the method may include receiving first information indicative of distances between each wireless tag of the group and between at least three other wireless tags of the group, tracking a first movement of a certain tag of the group of wireless tag in relation to other wireless tags of the group to provide first movement information, receiving, after the performing of the first movement, second information indicative of distances between each wireless tag of the group and between at least three other wireless tags of the group, and determining locations of the wireless tags of the group in response to the first information, second information and the first movement information. [A775]

"Subsurface imaging system and method for inspecting the condition of a structure"

In a method and system for inspecting the condition of a structure, the structure is scanned with a three-dimensional (3D) scanner. The 3D scanner includes a sensing system having one of a radar sensing device or an ultrasonic detection device. The sensing system detects 3D information about a subsurface of the structure, and the 3D scanner generates 3D data points based on the information detected by one or more of the radar sensing device and the ultrasonic detection device. A 3D model is constructed from the 3D data and is then analyzed to determine the condition of the subsurface of the structure. [A776]

"Parking assistance device"

Provided is a parking assistance device that can obtain information regarding the height from a parking road surface of an object without acquiring height information of an object in advance. The parking assistance device includes: an emission unit configured to emit ultrasonic waves in at least an outward lateral direction of a vehicle, a reception unit configured to receive reflection waves from an object reflecting the emitted ultrasonic waves, and an object determination unit configured to receive the reflection waves from an object existing on a far side of a target parking region as the vehicle enters the target parking region, and determine a feature relating to the height of the object based on a change in a detection state of the object, which was specified based on the obtained reflection wave data. [A777]

"Radar sensor for a motor vehicle, motor vehicle and communication method"

A radar sensor for a motor vehicle has at least one antenna arrangement for transmitting and receiving radar signals and a controller for controlling the operation of the antenna arrangement. The controller evaluates the received radar signals. The controller also operates the antenna arrangement to transmit and/or receive messages in a car-to-car communication. [A778]

"Method and arrangement for estimating at least one parameter of an intruder"

A method for estimating, from a platform, at least one parameter of an intruder. Consecutive frames of image data at different times of the intruder utilizing at least one passive sensor are generated. A direction from the platform to the intruder is determined based on the generated consecutive frames of image data. A time period remaining until a potential collision between the platform and the intruder is estimated. An angular extent of the intruder, as viewed by the passive sensor, is estimated based on the image data. At least one of a first relative location vector to a minimum intruder associated with the intruder or a second relative location vector to a maximum intruder associated with the intruder is estimated. An arrangement for generating input data to a sense-and-avoid system on-board a platform, a computer program, a computer program product and a platform carrying the arrangement are also provided. [A779]

"Indoor position location using delayed scanned directional reflectors"

A mobile device determines its location accurately by measuring the range to a position reflector as well as azimuth and elevation angles of arrival (AOA) at the reflector. The mobile can transmit a coded radar signal and process reflections to determine its location. The reflectors may include internal delays that can identify the reflector and provide transmit/receive separation for the mobile. The reflection can include a primary and further delayed secondary reflection. The mobile can determine the internal delay of the reflector based on the delay between primary and secondary reflections. The range and AOA information can be combined with information about the position, orientation, and characteristics of the reflectors to determine location. In some systems, the mobile device can determine its location in a three-dimensional space using reflections from only one reflector. The reflectors, which can be economically produced, can be unpowered and low profile for easy installation. [A780]

"Detection of conductive material in a thin film"

Provided are products used to detect and methods for detecting conductive materials in the presence of non-conductive materials, including non-conductive materials having dielectric properties. Specifically, the product is a conductive thin film detector, which is, preferably, a hand-held device designed to detect the presence of metal in, on, or under an object. This detection occurs even in the presence of non-conductive materials and other nearby conductive materials on objects that are not being tested. The device preferably includes: a power source, such as a battery, a method for activation, such as a press button, the necessary components to send and receive a radio frequency, e.g., a radio frequency generator, an antenna, and a radio frequency detector, and an indicator, such as a light or a meter, to, for example, indicate the strength of the radio frequency signal received. [A781]

"Real-time, two dimensional (2-D) tracking of first responders with identification inside premises"

A combination of active reader tags and ultra wideband (UWB) radar systems provide real-time monitoring of first responders, with identification of each team member using active tags, and detection of victims or other subjects using motion or breathing detection, in a field of operations such as a building affected by fire or hazardous material or search and rescue mission area. Initially, a cluster of miniaturized radars (sensors) act in a static mode of operation, gathering static radar information used to depict a constructed layout of the premises. The cluster of radars then operate in a dynamic mode that detects motion or breathing of multiple subjects inside the field of operations. With dual mode operation the system can read the active tags identification, and by triangulation, display the position of each first responder with its identification and positions of subjects on a composite image of the constructed layout. [A782]

"Predictive reasoning for controlling speed of a vehicle"

Methods and systems for predictive reasoning for controlling speed of a vehicle are described. A computing device may be configured to identify a first and second vehicle travelling ahead of an autonomous vehicle and in a same lane as the autonomous vehicle. The computing device may also be configured to determine a first buffer distance behind the first vehicle at which the autonomous vehicle will substantially reach a speed of the first vehicle and a second buffer distance behind the second vehicle at which the first vehicle will substantially reach a speed of the second vehicle. The computing device may further be configured to determine a distance at which to adjust a speed of the autonomous vehicle based on the first and second buffer distances and the speed of the autonomous vehicle, and then provide instructions to adjust the speed of the autonomous vehicle based on the distance. [A783]

"System and method for predicting behaviors of detected objects through environment representation"

Aspects of the invention relate generally to autonomous vehicles. The features described improve the safety, use, driver experience, and performance of these vehicles by performing a behavior analysis on mobile objects in the vicinity of an autonomous vehicle. Specifically, the autonomous vehicle is capable of detecting nearby objects, such as vehicles and pedestrians, and is able to determine how the detected vehicles and pedestrians perceive their surroundings. The autonomous vehicle may then use this information to safely maneuver around all nearby objects. [A784]

"Coaxially-fed slot array antenna and vehicle radar apparatus"

In a coaxially-fed slot array antenna including a coaxial line unit configured with a coaxial inner conductor and a coaxial outer conductor that incorporates the coaxial inner conductor, a feeding waveguide for feeding an electromagnetic wave to the coaxial line unit by way of a feeding slot, and a sub-array configured, corresponding to the coaxial line unit, with a plurality of emission slots formed on the external wall surface of the coaxial outer conductor, the space enclosed by the coaxial inner conductor and the coaxial outer conductor is filled with a foamed dielectric having a predetermined foaming rate. As a result, provision is made for a coaxially-fed slot array antenna that can enhance the flexibility in arranging the emission slots, change the width and the gradient of the main beam, and suppress a grating lobe. [A785]

"Roaming mobile sensor platform for collecting geo-referenced data and creating thematic maps"

A roaming sensor system collects data on the condition of roads and bridge decks and identifies and maps defects, including cracks, potholes, debonding, tracking, delamination, surface ice, surface water, and rebar corrosion. Data are collected by a vehicle or a fleet of vehicles driven at normal traffic speeds. The vehicle is outfitted with sensors that collect data using acoustic surface waves, ground penetrating radar, mm wave surface radar, and/or video images. The data are transmitted to a control center for analysis and distribution. [A786]

"Method and apparatus for enhanced multi-node utilization of an electromagnetic state space"

Methods and systems are provided for efficiently packing nodes within an electromagnetic state space. [A787]

"Associative object tracking systems and methods"

Systems and methods track a first object when continuous tracking information for the first object is not available. The systems and methods detect when the tracking information for the first object is not available. A last time of a last determined location of the first object is determined and a second object closest to the last determined location at the last time is determined. The location of the first object is associated with a location of the second object if tracking information for the first object is not available. [A788]

"Vehicle information recording apparatus"

A vehicle information recording apparatus for a vehicle includes a collision determination section and an information management section. The collision determination section determines the presence or absence of a collision between the vehicle and an object based on (i) detection values of impact sensors which detect impacts applied to the vehicle and (ii) detection values by proximity sensors which detect an approach of the object to the vehicle. The information management section records collision data concerning the collision based on a determination result by the collision determination section. This enables a detection of a collision with an object as a recording target while reducing influence of vibration or noise. [A789]

"Radar system and method"

A radar system for discriminating between sources of radar interference and targets of interest. The system includes a transmitter for transmitting radar signals into a region, a receiver for receiving return signals of the radar signals returned from within the region, and a processor for processing the return signals to discriminate between return signals returned from a first object and return signals returned from a second object where the return signals from the second object comprise both zero and non-zero Doppler components and interfere with the return signals from the first object. The radar system is operable for discriminating between the return signals when the return signals are received at a distance from the second object which is less than a proximity limit based on the geometry of the object. [A790]

"Device and method for judging likelihood of collision between vehicle and target, vehicle collision avoidance system, and method for avoiding collision between vehicle and target"

A device for judging a likelihood of a collision between a vehicle and a target is provided. The device comprises: a target detection sensor and an ECU. The ECU comprises: a CPU, an orientation determining unit configured to enable the CPU to determine the orientation of a target relative to a reference vehicle in which the device for judging a likelihood of a collision is mounted, using information which is detected by the target detection sensor, a change-amount detecting unit configured to enable the CPU to detect an amount of temporal change in the orientation of the target, and a determining unit configured to enable the CPU to determine a likelihood of a collision between the reference vehicle and the target under a condition that the amount of temporal change in the orientation of the target is a predetermined threshold or less. [A791]

"Radar device and method of processing signal"

A radar device according to an embodiment includes a transmission unit, a reception unit, and a processing unit. The transmission unit emits a transmission wave relating to a frequency-modulated transmission signal. The reception unit receives a reflected wave acquired by reflecting the transmission wave on an object as a reception signal. The processing unit detects object data corresponding to the object from the reception signal, outputs the object data to the vehicle control device that controls the vehicle, and removes object data satisfying the removal condition that is a condition used for determining whether or not object data is to be removed from an output target for the vehicle control device and includes at least the distance and the relative speed of the object data with respect to the speed of the vehicle as conditions from output targets for the vehicle control device. [A792]

"Object detecting device, object detecting method, object detecting program, and motion control system"

An object detecting device includes a signal transmitting and receiving unit configured to generate an intermediate frequency signal based on a transmission signal and a reception signal which is a reflected wave thereof, a processing unit configured to determine that an image of a target peak frequency is a virtual image based on noise when it is determined that a peak frequency of predetermined n times the target peak frequency is not present in information based on the intermediate frequency signal generated by the signal transmitting and receiving unit and to detect an object based on the determination result, where n is an integer of 2 or greater. [A793]

"Wafer scale sensor ultra-wideband array for tissue diagnosis"

Radar imaging for medical diagnosis addresses the need for non-ionizing and low-cost alternatives to conventional medical diagnosis methods, such as mammography x-ray techniques, which expose patients to ionizing radiation for cancer detection. An ultra wide band (UWB) sensor can produce very fine beams at the V- or W-bands using beam forming techniques developed specifically for wafer scale antenna arrays. The high bandwidth radio waves can penetrate tissue and resolve tissue anomalies with high-resolution. Pseudo-random coding creates a signal that allows the correlating receiver to extract very low energy reflected signals from background noise providing coding gain. An integrated panel of sensor antenna arrays enables rapid scanning of the subject area, such as breast tissue, to detect anomalies by eliminating the need for mechanical scanning (e.g., moving the sensors relative to the subject) because the wafer scale antenna array can instantaneously take the desired topographic picture of the subject area. [A794]

"RF tag reader for accurate position determination"

A system for accurate positioning using radio frequency tags and corresponding method thereof. The system comprises at least two antennas in phased array combination and an RF tag position determination unit coupled with the at least two antennas. The system also comprises a main RF output and a position detection output. The RF tag position determination unit arranged to generate a position detection signal at the position detection output responsive to comparison of a signal received by each of the at least two antennas. [A795]

"Method and device for ascertaining and compensating for a misalignment angle of a radar sensor of a vehicle"

A method for ascertaining and compensating for a misalignment angle of a radar sensor of a vehicle, includes generating a first set of data which contains information about a measured alignment of the radar sensor with respect to an instantaneous movement of the vehicle, generating a second set of data which contains information about a measured alignment of the reference axes defined at the vehicle with respect to the instantaneous movement of the vehicle, ascertaining a misalignment angle by comparing the generated first set of data to the generated second set of data, compensating for the ascertained misalignment angle by changing an emission direction of the main lobe of the antenna characteristic as a function of the ascertained misalignment angle. [A796]

"Methods and systems for determining the location of an electronic device using multi-tone frequency signals"

Embodiments of the present invention include a method of determining a location of a mobile device. The method comprises transmitting a signal between a plurality of known locations and receiving signal at device of unknown location such as a mobile device. The signal may include multiple tones having different frequencies and resulting in sets of residual phase differences. The location of the mobile device may be determined using the known locations and the frequency and phase differences between the transmitted tones. In one embodiment, OFDM signals may be used between an access point and mobile device, for example, to determine the location of the mobile device. [A797]

"Vehicle travel assist apparatus"

A collision avoidance ECU sets a model deceleration change amount to smaller value in a state in which it is difficult to reduce the speed of a host vehicle than in a state in which it is easy to reduce the speed of the host vehicle. The collision avoidance ECU calculates a first target value by multiplying the model deceleration change amount by the elapsed time. The collision avoidance ECU obtains a subtraction value by subtracting the current reference relative deceleration from the first target value. Then, the collision avoidance ECU determines a target relative deceleration to be a greater value when the subtraction value is large than when the subtraction value is small, and carries out brake control so that the reference relative deceleration approaches the target relative deceleration. [A798]

"Advanced warning and risk evasion system and method"

This invention relates in general to the field of safety devices, and more particularly, but not by way of limitation, to systems and methods for providing advanced warning and risk evasion when hazardous conditions exist. In one embodiment, a vicinity monitoring unit is provided for monitoring, for example, oncoming traffic near a construction zone. In some embodiments, the vicinity monitoring unit may be mounted onto a construction vehicle to monitor nearby traffic and send a warning signal if hazardous conditions exist. In some embodiments, personnel tracking units may be worn by construction workers and the personnel tracking units may be in communication with the vicinity monitoring unit. In some embodiments, a base station is provided for monitoring activities taking place in or near a construction site including monitoring the locations of various personnel and vehicles within the construction site. [A799]

"System and method for detecting the presence of a moving object below a vehicle"

This disclosure provides systems, methods and apparatus for detecting the presence of an object or living being below a vehicle. In one aspect a wireless charging system for an electric vehicle is provided. The system includes a vehicle charging pad configured to wirelessly receive power from a base charging pad spaced from the vehicle charging pad. The system further includes a detection apparatus on a surface of the vehicle. The detection apparatus is configured to detect existence of a moving object within an exclusion zone underneath the vehicle.

The detection apparatus includes at least one antenna assembly configured to transmit radiation and to receive radiation reflected from material within the exclusion zone. The at least one antenna assembly has a radiation pattern for at least one of the transmitted radiation and the received radiation, the radiation pattern having a maximum gain and having a first gain along a first line perpendicular to the surface less than half of the maximum gain on a linear scale. [A800]

"Apparatus for measuring vehicle queue length, method for measuring vehicle queue length, and computer-readable recording medium storing computer program for measuring vehicle queue length"

An apparatus includes: a processor that executed a procedure, the procedure including: detecting a moving vehicle as the moving vehicle approaches a vehicle queue based on a signal from a sensor, acquiring a position and a speed of the moving vehicle based on the signal, calculating a stop position of the moving vehicle based on a change in the position and the speed of the moving vehicle, and calculating a length of the vehicle queue based on the stop position of the moving vehicle. [A801]

"Synchronization of vehicle sensor information"

A method includes receiving and storing sensor data including a first plurality of data points indicative of a plurality of respective states of the environment external to a vehicle at a plurality of respective times, operational data including a second plurality of data points indicative of a plurality of respective states of an operational parameter of the vehicle at a plurality of respective times, and synchronization data. The method also includes generating a virtual model of an event involving the vehicle using the stored data, at least by generating a first visual representation of the plurality of respective states of the external environment, generating a second visual representation of the plurality of respective states of the operational parameter, and using the synchronization data to cause the first visual representation to be displayed simultaneously with, and in a time-aligned manner with, the second visual representation. [A802]

"Point pattern match-based change detection in a constellation of previously detected objects"

A method and system is provided that applies attribute- and topology-based change detection to objects that were detected on previous scans of a medium. The attributes capture properties or characteristics of the previously detected objects, such as location, time of detection, detection strength, size, elongation, orientation, etc. The locations define a three-dimensional network topology forming a constellation of previously detected objects. The change detection system stores attributes of the previously detected objects in a constellation database. The change detection system detects changes by comparing the attributes and topological consistency of newly detected objects encountered during a new scan of the medium to previously detected objects in the constellation database. The change detection system may receive the attributes of the newly detected objects as the objects are detected by an object detection system in real time. [A803]

"Device for signature adaptation and object provided with such a device"

The invention pertains to a device for signature adaptation, comprising at least one surface element (100, 300, 500) arranged to assume a determined thermal distribution, wherein said surface element comprises at least one temperature generating element (150, 450a, 450b, 450c) arranged to generate at least one predetermined temperature gradient to a portion of said at least one surface element. Said at least one surface element (100, 300, 500) comprises at least one radar suppressing element (190) , wherein said at least one radar suppressing element (190) is arranged to suppress reflections of incident radio waves. The invention also concerns an object provided with a device for signature adaptation. [A804]

"Motor vehicle safety arrangement and method"

A safety arrangement and method are described for controlling automatic travel of a fully automated vehicle. One or more forward-looking detection systems are provided for detecting objects in a future path of the vehicle. A control unit is configured to determine a detection confidence for the detected objects. The control unit is further operable to, upon low confidence for existence of a detected object, control a brake system of the vehicle to apply a predetermined limited amount of braking until high confidence is obtained for existence or non-existence of the previously detected object. Thereafter the control unit is further operable to apply full braking if high confidence is obtained for existence of the previously detected object and to discontinue braking if high confidence is obtained for non-existence of the previously detected object. [A805]

"System and method for modeling advanced automotive safety systems"

A system and methods are disclosed for providing integrated software development environment for the design, verification and validation of advanced automotive safety systems. The system allows automotive software to be developed on a host computer using a collection of computer programs running simultaneously as processes and synchronized by a central process. The software disclosed uses separate synchronized processes, permitting signals from disparate sources to be generated by a simulation running on the host computer or from actual sensors and data bus signals coming from and going to actual vehicle hardware which is connected to their bus counterparts in the host computer on a real-time basis. The methods provide a data model that first extends the capabilities of the physical data model and then translates, gates, optimizes, fuses, filters and manages the physical representation of the logical model into a state estimation of the situation around the vehicle. [A806]

"Display device, display program and display method"

A touch panel device (display device) acquires a first sensor image, a second sensor image, and a third sensor image. The touch panel device displays acquired images in respective divided areas of a display screen. The touch panel device detects a predetermined touch gesture and detects an operated location of the touch gesture. The touch panel device identifies which image the operated location indicates. The touch panel device performing processing corresponding to the identified touch gesture (scrolling or zooming of a display image) , and changes a direction or a motion range of the processing according to the identified sensor image. [A807]

"Micro climate corrections for radar interferometry measurements"

A method for monitoring movement of a surface using ground based radar interferometry measurements includes identifying micro climates on the surface and determining boundaries of the micro climates on the surface. One or more first sensors are arranged at a measurement site for measuring first atmospheric conditions at the measurement site. One or more additional sensors are arranged in each of the micro climates for measuring atmospheric conditions in the micro climates. An atmospheric correction is determined for each of the micro climates. The atmospheric correction for each micro climate is based on the first atmospheric conditions at the measurement site and the atmospheric conditions at the micro climate. The ground based radar interferometry measurements are performed across the surface, and the ground based radar interferometry measurements within the boundary of each micro climate are corrected using the atmospheric correction for the micro climate. [A808]

"Method for cyclically measuring distances and velocities of objects using an FMCW radar sensor"

In a method for cyclically measuring distances (d) and relative velocities (v) of objects using an FMCW radar sensor, the frequency (f) of a transmitted signal of the radar sensor is periodically modulated, each period (P) including at least two differing modulation patterns, a relationship between distance (d) and velocity (v) of the object being derived from a signal received for a single modulation pattern, and the signals received for multiple modulation patterns being adjusted to one another in order to determine one value each for the distance and the velocity per each measuring cycle. for the adjustment between a signal obtained for a modulation pattern in the instantaneous measuring cycle and the signal (s) obtained for other modulation patterns, the signals from at least one previous measuring cycle are utilized. [A809]

"Device and method for determining media characteristics and container characteristics"

A fill-level measuring device includes a self-learn device that is able to automatically determine the length of the dome shaft of the container. To this effect the self-learn device uses a multiple echo classified as such by a multiple-echo detection device. In this manner the result of fill level measuring may be improved. [A810]

"Device and method for lateral environment detection of a motor vehicle"

A device for lateral environment detection of a motor vehicle and a method for the substantially simultaneous operation of a parking support device and a door protection device is provided. The parking support device and the door protection device perform an environment detection with structurally identical environmental sensors. In order to be able to operate these simultaneously or overlapping in time, without interference by cross echo pulse occurring, it is provided to operate the simultaneously operated environmental sensors at frequencies that are shifted relative to one another and of which at least one of the frequencies is also shifted with respect to a resonance frequency of the environmental sensors. [A811]

"Methods and apparatus for adaptive motion compensation to remove translational movement between a sensor and a target"

Methods and apparatus for performing adaptive motion compensation to remove translational movement between a sensor and a target using data from the sensor. After whitening, data can be processed to select a target and focus frequency components. Dynamic sliding window processing can be performed on processed time domain data to estimate an instantaneous range rate for the target. [A812]

"Offset frequency homodyne ground penetrating radar"

Systems and methods involve generating a baseband signal, up-converting the baseband signal to a radar signal frequency, filtering a lower sideband of the up-converted signal, and transmitting the filtered up-converted signal. Systems and methods also involve receiving a return signal, down-converting the return signal using a signal having a frequency offset from the up-converted signal, filtering the upper sideband of the down-converted return signal, and producing a baseband return signal. [A813]

"Method and device for ascertaining a misalignment of a radar sensor of a vehicle"

A method for ascertaining a misalignment of a radar sensor of a vehicle ascertains a misalignment angle of the misalignment using a weighted averaging of calculated differences between first and second angles of radar reflectors relative to various axes. Also described is a device for ascertaining this misalignment. [A814]

"Integrated rainfall estimation method using X-band dual-polarimetric radar measurement data"

An integrated rainfall calculation method using X-band dual-polarimetric radar measurement data includes a precipitation classification step of classifying hydrometeors into four types of snow, rain/snow, rain and non-meteorological target through a fuzzy logic technique using a correlation coefficient (cross correlation coefficient, .rho..sub.hv) , features of a measured differential propagation phase (.PSI..sub.dp (r)) or differential propagation phase (.phi..sub.dp) and a signal-to-noise ratio (SNR) as input variables (input feature vector) , a specific differential phase calculation step of separately calculating a specific differential phase by applying a specific differential phase using a total difference of differential phase and signal-attenuation corrected reflectivity for the rain among the classified hydrometeors and applying a specific differential phase calculated using a filtering method for the other hydrometeors, and a rainfall calculation step of calculating rainfall by using a relation between the specific differential phase and the rainfall and using the separately calculated specific differential phase. [A815]

"Radar apparatus for vehicle"

A radar apparatus for a vehicle includes a radar unit provided at an inner side of a radiator grill for a vehicle, a multi-layer transmission cover which is fitted into the radar unit and on a front surface of which a plurality of transmission layers through which a radar beam radiated through the radar unit transmits are formed, and a mounting portion in which a connection body formed by connecting the multi-layer transmission cover to the radar unit is connected to a vehicle body. [A816]

"Electromagnetic emitter emitting simultaneously along three orthogonal axes to detect object position and orientation"

An electromagnetic emission device for helmet position detection systems includes an electromagnetic emitter and control electronics, the emitter comprising three windings arranged perpendicularly, the processing electronics comprising three electronic chains each associated to a given winding and working simultaneously. Each electronic chain comprises closed-loop control means arranged such that the related signal generated comprises three analogue components: a first component, being the stimulus component, modulated at an "emission" frequency of the winding, each of the three emission frequencies being different from one winding to the next, and a second and a third component, referred to as correction components, modulated at an emission frequency of another winding, the phase and amplitude of which are calculated such as to compensate the parasitic signals received by said winding from the other two windings. Each winding in steady-state only emits electromagnetic radiation at its own emission frequency and at a predetermined phase and intensity. [A817]

"Wave dielectric transmission device, manufacturing method thereof, and in-millimeter wave dielectric transmission method"

A millimeter wave transmission device, the millimeter wave transmission device with (a) a first signal processing board for processing a millimeter wave signal, (b) a second signal processing board signal-coupled to the first signal processing board to receive the millimeter wave signal and perform signal processing with respect to the millimeter wave signal, and (c) a member provided between the first signal processing board and the second signal processing board and having a predetermined relative dielectric constant and a predetermined dielectric dissipation factor. The member constitutes a dielectric transmission path via which the millimeter wave signal is transmitted between the first signal processing board and the signal processing board. [A818]

"Method and device for determining a linear terrain profile along a lateral approach trajectory of an airport"

A device comprising a computation unit for computing, for each of a plurality of different distances relative to a threshold of a landing runway along a lateral approach trajectory, a geometric altitude, using a measured and stored barometric altitude, a computation unit for computing a terrain height, by subtracting, from the computed geometric altitude, a measured and stored height, and a computation unit for determining a terrain profile from the set of terrain heights computed for the set of different distances. [A819]

"Apparatus for position notification of vehicle, method and computer-readable medium"

A vehicle position notification apparatus include a main body unit which includes at least a detection unit, an attachment unit and a communication unit, wherein the detection unit detects a body under detection, the attachment unit makes the main body unit adhere to the body under detection detected, and the communication unit transmits position information of the main body unit. [A820]

"Method for detecting traffic infractions in a traffic light zone through rear end measurement by a radar device"

A method for detecting a traffic violation in a traffic light zone through rear end measurement by a FMCW radar device (1) . A specific position (sP.sub.1) assigned to the front of a vehicle (3) and the radial velocity are derived from the measurement signal obtained at a first measurement time (t.sub.1) , and a first anticipated position (eP.sub.1) for the front of the vehicle is calculated by the distance-time rule at the second measurement time (t.sub.2) by means of the time period between the first measurement time (t.sub.1) and the second measurement time (t.sub.2) . Through repeated calculation of an anticipated position for the front of the vehicle at further measurement times, an anticipated time when the front of the vehicle crosses a stop line (5) defining the traffic light zone is predicted iteratively with the determined vehicle velocity. [A821]

"Road surface condition detection device and road surface condition detection method"

A radio waves receiving unit receives horizontally polarized waves and vertically polarized waves of radio waves radiated from an object at a radiation angle. An image generation unit generates a horizontally polarized waves image and a vertically polarized waves image based on the horizontally polarized waves and the vertically polarized waves, respectively. A polarization ratio calculation unit calculates, for each radiation angle, a polarization ratio which is a ratio of intensity of the horizontally polarized waves to the vertically polarized waves based on the horizontally polarized waves image and the vertically polarized waves image. A refractive index calculation unit calculates a refractive index of the object based on a change between polarization ratios of two different radiation angles. A road surface condition recognition unit recognizes a condition of a road surface based on the refractive index. [A822]

"Method for classifying moving vehicles"

A method for classifying vehicles in which an angle-resolving radar device yields measurement signals which have frequencies corresponding to a Doppler shift and which originate from measured vehicles and from which radial distances, object angles and radial velocities can be derived. The frequencies of the acquired measurement signals are stored as functions over the measurement time period, and a spectrogram is formed for every vehicle therefrom. Subsequently, the spectrograms are checked for assessment regions with maximum bandwidth of the frequency. These assessment regions are compared with assessment regions of stored spectrograms for different vehicle classes and associated with the most similar such that the measured vehicles are classified. [A823]

"Radar system"

A component is disclosed for a radar system that comprises a main antenna operable to move azimuthally to sweep an area, a transmitter for transmitting pulses from the antenna and a receiver for receiving return signals. The component is operable to enable the radar system to detect a target in the presence of a wind turbine located in the area. The component comprises a plurality of auxiliary antennas and a processor for processing the return signals, the processor being operable to generate a signature of the wind turbine from return signals received by the main and auxiliary antennas in a training process, to generate model data of a target or to receive model data of the target from memory, and to test returned data for the presence of a target, and, if a target is detected, to generate data representing a detected target. A method of detecting the position of a target in the presence of a wind turbine using the radar system is also described. [A824]

"Method of distance measurement"

A method, device, system and use for determining a distance, location and/or orientation including the at least relative determination of a position of at least one object using at least two active anchors. A first signal is emitted by a first of the two anchors and is received at the object and by a second of said two anchors. A phase measurement is performed at said second anchor and wherein a distance determination with respect to said first anchor is performed and/or the distance from said first anchor to said second anchor is known. A second, particularly electromagnetic, signal is emitted from said second anchor, and information on phase measurement and distance between said first and second anchors is made available to a computation unit and at least one phase measurement respectively of said first and second signal is performed at said object and made available to said computation unit. [A825]

"Waste water assessment"

Waste water assessment apparatus, a method and a computer program are provided. The waste water assessment apparatus comprises: transceiver circuitry configured to transmit a microwave signal and to receive one or more reflections of the microwave signal, and processing circuitry configured to process the one or more reflections of the microwave signal to determine one or more characteristics of waste water flowing through a conduit. [A826]

"Calibrated hardware sensors for estimating real-world distances"

In some embodiments, methods and systems are provided for assisting a user in determining a real-world distance. Hardware-based sensors (e.g., present in a mobile electronic device) may allow for a fast low-power determination of distances. In one embodiment, one or more telemetry-related sensors may be incorporated into a device. for example, data detected by a frequently-calibrated integrated accelerometer may be used to determine a tilt of the device. A device height may be estimated based on empirical data or based on a time difference between a signal (e.g., a sonar signal) emitted towards the ground and a corresponding detected signal. A triangulation technique may use the estimated tilt and height to estimate other real-world distances (e.g., from the device to an endpoint or between endpoints) . [A827]

"Collision avoidance in vehicular networks"

A method and nodes for collision avoidance in a vehicular network comprising a plurality of vehicles and lower-speed users. Data from a plurality of position notification messages sent from the lower-speed-node is received (directly from the lower-speed-node or through a road-side-node) and processed, in a vehicle-on-board-node of a moving vehicle, with positioning data of the moving vehicle into collision avoidance instructions. The collision avoidance instructions may be provided inside the vehicle by displaying the instructions on a screen and/or broadcasting the instructions through a speaker in the vehicle. The collision avoidance instructions may also be automatically applied by modifying dynamic parameters of the vehicle (e.g., affecting the vehicle speed and/or changing direction of the vehicle) . The position notification message may comprise a sequential number value, a temporary ID value, a geographic latitude value, a geographic longitude value, and a class-speed value. [A828]

"Travel distance measurement device"

A travel distance measurement device includes a transmitting antenna that is disposed in a vehicle and emits a transmission signal, as a radio wave, toward a ground surface, a receiving antenna that is disposed in the vicinity of the transmitting antenna, and receives a radio wave reflected from the ground surface and acquires a reflection signal, a distance calculator (an IQ demodulator and a phase conversion integrator) that calculates the travel distance of the vehicle on the basis of the acquired reflection signal, a gyro sensor that measures a predetermined parameter regarding curve traveling of the vehicle, and a correcting operation unit that corrects the calculated travel distance on the basis of the measured parameter. [A829]

"Method for detecting a wheel of a vehicle"

A rotating wheel of a vehicle is detected by evaluating the Doppler shift of a measuring beam emitted by a detector unit passed by the vehicle, reflected by the wheel and returned in Doppler-shifted form. In a relative position to the wheel, the vehicle comprises an onboard unit, which can establish a radio communication with a transceiver having a known location in the detector unit. The direction and distance of the onboard unit from the transceiver are measured on the basis of at least one radio communication between the same. The radiation direction or radiation position of the measuring beam is controlled in accordance with the measured direction and distance and taking into consideration the aforementioned relative position and location. The relative position is stored in the onboard unit and is read from the onboard unit by way of a radio communication for the purpose of the aforementioned consideration. [A830]

"Creating a model of a scanned surface for comparison to a reference-surface model"

Generating a scanned-surface model representing a scanned surface includes various steps. for example, instrument model coordinates may be obtained that represent a position of the instrument in the 3D model. In addition, surface-distance measurements may be derived describing a distance from the scanned surface. Inertial measurements are also recorded. The instrument model coordinates, surface-distance measurements, and inertial measurements are correlated and filtered by a rules based selection process to determine scanned-surface model coordinates. [A831]

"Forward facing sensing system for vehicle"

A forward facing sensing system for a vehicle includes a radar sensor device disposed at the vehicle and having a sensing direction forward of the vehicle and an image sensor disposed behind the vehicle windshield so as to view forward of the vehicle through the windshield. A control includes an image processor operable to analyze image data captured by the image sensor in order to, at least in part, detect an object present forward of the vehicle. The control, responsive at least in part to processing of captured image data by the image processor and to sensing by the radar sensor, determines that a potentially hazardous condition may exist in the path of forward travel of the vehicle. The radar sensor device and the image sensor collaborate in a way that enhances determination of existence of the potentially hazardous condition in the path of forward travel of the vehicle. [A832]

"Enhanced RF detection system"

A radio frequency (RF) obstacle detection system of a vehicle includes an RF radar module that transmits an initial RF signal having a first signal strength and to receive at least one reflected RF signal having a second signal strength based on the initial RF signal. A radar reflector module is coupled to the vehicle and disposed at a first distance remotely located from the RF radar module. The radar reflector module receives the RF signal generated by the RF radar module and efficiently retroreflects the RF signal to generate a reflected signal having a second signal strength back to the RF radar module. A control module determines a second distance between the radar reflector module and at least one obstacle remotely located from the vehicle based on the reflected signal provided by the radar reflector module and a received signal induced by the at least one obstacle. [A833]

"Full analog microwave sensor for multiple range selection and ultra-low power consumption"

A microwave sensor adjusts its sensing range based on a range gate selected from multiple range gates. An active antenna module transmits a first FMCW signal toward a target based on the selected range gate and for receiving second FMCW signal reflected from the target. A modulating module is used for generating modulation signal. The bandwidth of the first FMCW signal depends on an amplitude of the modulation signal. A first demodulator is used for demodulating the first FMCW signal and the second FMCW signal to generate beat frequency. A second demodulator is used to demodulate the beat frequency signal to generate a Doppler signal. An indentifying circuit is used for generating a triggering signal based on a voltage difference between integral of the Doppler signal from an object within the rage gate and an integral of clutter. [A834]

"Manual positioning device"

A manual positioning device includes at least one receiver, a reference network, a first switch, and at least one second switch. The at least one second switch, together with the first switch, is configured to switch at least two different reference signal paths for determining reference signals on the reference network. [A835]

"Driver assistance system for a motor vehicle"

A driver assistance system and method are disclosed which provide improved determination of possible collision objects. The system includes at least one sensor and a classification device. The threshold value of the classification device for classifying an object sensed by the at least one sensor as a possible collision object is lowered when a possible hazard situation in a region of surrounding located in front of the motor vehicle is determined based on data received from an inter-vehicular communication device. As a result, hazard situations which may not yet be determined by means of sensors belonging to conventional vehicles because of the distance or the position of the possible hazard situation with respect to the motor vehicle can be detected earlier. [A836]

"Time of arrival based positioning system"

A TOA positioning system can be implemented that employs a calculated initial location of a wireless network device. for each of a plurality of reference wireless network devices, a distance between the wireless network device and the reference wireless network device is determined based, at least in part, on a round trip transit time between the wireless network device and the reference wireless network device. An initial location of the wireless network device can be calculated based, at least in part, on a location of each of the plurality of reference wireless network devices. A location of the wireless network device can be estimated based, at least in part, on the calculated initial location, the distance to each of the reference wireless network devices, and an initial distance calibration constant. [A837]

"User interfaces"

A first electronic device is operated in the presence of a second electronic device. Both are configured to transmit acoustic signals, the first being configured to transmit signals with a first characteristic. The first device determines the presence of the second device and thereafter transmits acoustic signals having a second, signal characteristic, different from the first characteristic, and giving a reduced interference between signals transmitted from the first and second devices respectively than the first signal characteristic. Acoustic signals comprising reflections of the transmitted signals from an object are received at the first device, and are used to characterise the motion of the object and thereby control a function of the first device. [A838]

"Weather radar apparatus, observation sequence generation method, and observation sequence generation program"

According to one embodiment, a weather radar apparatus includes an antenna apparatus, a signal processing apparatus, a data converter, a forecasting unit, a state determination unit, and radar controller. The antenna apparatus radiates a radar pulse and receives a reflection pulse. The signal processing apparatus calculates a reception intensity, a Doppler speed, and a speed width. The data converter calculates rainfall intensity data and wind direction/speed data. The forecasting unit generates forecasting data based on the rainfall intensity data and on the wind direction/speed data. The state determination unit generates an observation sequence. The radar controller controls the antenna apparatus in accordance with the observation sequence. [A839]

"Receiver with programmable gain for UWB radar"

A receiver for an ultra wideband (UWB) pulse radar system includes a programmable gain network (PGN) block coupled to process a received UWB radar signal. The programmable PGN block includes programmable attenuator having an output coupled to an input node of a UWB low noise amplifier (LNA) , and a fast acting power limiter is between the input node and a system ground and/or a power supply node for the radar system. A sampling unit is coupled between an output of the LNA and a processor. The processor implements an attenuation algorithm, wherein the processor is coupled to the programmable attenuator, and provides attenuation control signals to dynamically control a gain or attenuation of the programmable attenuator, such as based on a distance from a transmitting antenna to the product material. [A840]

"Transportable radar utilizing a fiber optic rotary joint for communication of radar reflectivity data and harmonic drives for positioning the antenna"

A transportable weather radar, including radar electronics functionally located above the elevational joint, a frame superstructure rotationally connected to an elevational assembly supporting the elevational joint, a rotational drive assembly mounted below and supporting the elevational assembly, and at least one harmonic drive for positioning the radar antenna. The radar includes a fiber optic rotary joint positioned above a slip ring assembly which is positioned within a lower portion of the elevational assembly so that as the elevational assembly rotates a fiber optic cable connected to the lower end of the fiber optic rotary joint is stationary relative to the rotating elevational assembly. The slip ring assembly permits electrical signals to traverse through traditional metal cables from the pedestal to the frame superstructure where electronics are held. [A841]

"Transportable radar utilizing harmonic drives for anti-backlash antenna movement"

A transportable weather radar having radar electronics functionally located above the elevational joint and a frame superstructure rotationally connected to the elevational joint onto which is mounted a parabolic radar antenna adapted for Doppler weather radar use. The radar has a rotational drive assembly mounted below and supporting the elevational joint and a harmonic drive unit positioned inside the elevational joint so that the antennae may be rotated without significant backlash during rotational changes. A hollow center in the rotational joint allows for the passing of electronics cable through the middle of the joint and down through rotating assemblies and to electronics in or adjacent to the radar pedestal. [A842]

"Method of real time subsurface imaging using electromagnetic data acquired from moving platforms"

A method for the real time volume imaging of geological structures and/or man-made objects having electrical conductivity is described, using electromagnetic (EM) sources and/or EM sensors mounted from at least one moving platform. The EM sources may include natural EM sources and/or man-made inductive sources and/or man-made galvanic sources. The EM sensors may measure at least one component of the EM field at the at least one sensor position. The EM fields measured for each combination of EM source and EM sensor may be volume imaged in real time using a moving sensitivity domain that captures the finite spatial sensitivity of each combination of EM sources and EM sensors. At least one desired property, such as conductivity, dielectric permittivity and/or induced polarization parameters, may be derived from the volume image, providing a reconstruction or classification of the physical properties of the geological structures and/or man-made objects. [A843]

"Negative obstacle detection with stereo camera and long range radar"

A negative obstacle detection system for a vehicle comprises a stereo camera mountable to the vehicle to provide a forward facing image and a long range radar mountable to the vehicle to emit a signal in a forward direction from the vehicle. An electronic control unit receives data from the stereo camera and the long range radar to determine if a negative obstacle may be located in a forward proximity to the vehicle. [A844]

"Behavior based friend foe neutral determination method"

A method for behavior based Friend/Foe/Neutral determination is disclosed. The method receives RF communications from a plurality of perceived entities and records a plurality of first level characteristics of the RF communications. The method determines, from an analysis of the first level characteristics a plurality of second level characteristics of the RF communications. From these second level characteristics, the method determines transmission patterns of the entities over time which lead to an ultimate classification of the perceived entity as a Friend/Foe/Neutral based on the patterns. [A845]

"Radar device"

A radar transmitting unit Tx transmits a radio-frequency radar transmission signal from a transmission antenna which is inclined in the direction of a depression angle .phi.. A radar receiving unit Rx estimates the height and speed of a vehicle which travels on a road surface using a reflected wave signal from the vehicle. A template generating unit generates a variation in a phase component of the reflected wave signal corresponding to N heights and speeds of the vehicle as N templates. N vehicle height/speed template correlation calculation units #1 to #Nrep calculate correlation on the basis of any one of the N templates and a correlation value between the reflected wave signal and a transmission code of the radar transmission signal. [A846]

"Proximity sensing using EHF signals"

A system for sensing proximity using EHF signals may include a communication circuit configured to transmit via a transducer an EM signal at an EHF frequency, and a proximity sensing circuit configured to sense a nearby transducer field-modifying object by detecting characteristics of a signal within the communication circuit. A system for determining distance using EHF signals may include a detecting circuit coupled to a transmitting communication circuit and a receiving communication circuit, both communication circuits being mounted on a first surface. The transmitting communication circuit may transmit a signal toward a second surface, and the receiving communication circuit may receive a signal relayed from the second surface. The detecting circuit may determine distance between the first surface and a second surface based on propagation characteristics of the signals. [A847]

"Railroad crossing barrier estimating apparatus and vehicle"

A railroad crossing barrier estimating apparatus and a vehicle that incorporates therein such a railroad crossing barrier estimating apparatus are provided. When at least one of an external object the transverse width of which increases over time and an external object having a given length at a certain height from the ground is detected, the vehicle or the railroad crossing barrier estimating apparatus estimates the detected external object as a railroad crossing barrier. [A848]

"System and method for collision avoidance maneuver path determination with jerk limit"

In a vehicle, an optimal path curvature limited by one or more constraints may be determined. The constraints may be related to lateral jerk and one or more vehicle dynamics constraints. Based on the optimal path curvature, an optimal vehicle path around an object may be determined. The optimal vehicle path may be output to a collision avoidance control system. The collision avoidance control system may cause the vehicle to take a certain path. [A849]

"W-band, ultra-wide band (UWB) trajectory detector"

An ultra-wideband (UWB) radar imaging system is carried by a mobile platform--such as an aircraft--the UWB radar imaging system including multiple UWB radar sensors, the UWB radar sensors transmitting a high resolution radar signal using an array of power amplifiers and corresponding polarizing antenna arrays to form spatial power combining and beam forming from each UWB radar sensor, and receiving reflections using an array of low noise amplifiers and corresponding antenna arrays to form spatial power combining from the reflections at each. UWB radar sensor, processing the radar sensor data from the UWB radar sensors by an imaging processor for detecting a ballistic projectile, and providing trajectory information of a detected ballistic projectile on a display. Trajectory modeling enables fusing the radar sensor data with optical or thermal imaging data and the trajectory information to display a probable source location of the detected ballistic projectile. [A850]

"Standoff screening apparatus for detection of concealed weapons"

A walk-through screening station scans individuals to detect contraband such as a concealed weapon or improvised explosive device (IED) using ultra wideband (UWB) radar sensing and imaging systems employing wafer scale active array antennas. UWB radar and advanced imaging technology enable automated threat recognition and display for monitoring personnel. The station may scan subjects passing close to or within an aperture width of an array of radar transceivers. Direct calibration by use of reflectors positioned at known locations in the image may be used to implement scanning and imaging so close to the array. The scanning station may employ an easy-to-set-up pair of panels that may be readily deployed by security providers wherever access control--such as to a meeting place or transportation boarding--is needed. Imaging and display processing may provide an abstract display--such as a stick figure representation of anatomy--to address privacy issues and concerns. [A851]

"Monitoring device and monitoring method"

A monitoring device includes a memory configured to store first and second background information related to positional information of a fixed object existing in a detection area of a radar device that receives a reflected wave from an object existing at an emission destination of an emitted radar wave and detects position and moving velocity information of the object as detection information of the object, and a processor configured to detect, upon receiving a first specified signal, a temporary fixed object existing in a detection area of the radar device by using the detection information and the first background information stored in the memory, and to detect, upon receiving a second specified signal, a movement object existing in the detection area of the radar device by using the detection information and the second background information stored in the memory. [A852]

"System and method for estimating range to an RFID tag"

The a system for measuring distance between an RFID reader and tag, including an adaptive linear combiner, which is a tapped delay line with controllable weights on each tap, and outputs that are summed and subtracted from a reference to produce an error signal. After a sufficient number of cycles, the weight distribution indicates the delay of the received signal with respect to the reference, and by extension determines the distance between the tag and receiver. [A853]

"Driver assist system for vehicle"

A driver assist system for a vehicle includes at least one non-visual sensor and a color video rear backup camera having a field of view rearward of the vehicle, with the field of view of the camera encompassing a ground area to the rear of the vehicle. An image processor processes image data captured by the camera. A video display screen is viewable by a driver of the vehicle. During a reversing or parking maneuver of the vehicle, images derived, at least in part, from image data captured by the camera are displayed by the video display screen to assist the driver in operating the vehicle. At least one indication is provided to a driver of the vehicle, at least in part, responsive to detection by the non-visual sensor of at least one object external of the vehicle. [A854]

"Wireless localisation system"

Disclosed is an apparatus for estimating the location of a remote node. The apparatus comprises an antenna array comprising a plurality of elements in a fixed spatial arrangement, at least one element being a transmitting element configured to transmit a first wireless signal to the remote node, and at least two elements being receiving elements configured to receive a second wireless signal transmitted by the remote node in response to the first wireless signal. The apparatus further comprises a signal processing unit connected to the antenna array, the signal processing unit being configured to: estimate a plurality of round trip distances using the wireless signals, each round trip distance being from a transmitting element to the remote node and back to a receiving element, and estimate the location of the remote node using the round trip distance estimates. [A855]

"Vehicle with improved traffic-object position detection using symmetric search"

A method for detecting the position of a target object in the environment of a host vehicle. The method may include receiving a first position of the target object as detected by an object position sensor which emits waves and receives the waves that are reflected back by the target object, and receiving an image containing the target object as detected by an image sensor. The method may also include projecting the first position on the image, and refining the first position by computing a second refined position of the target object on the basis of a symmetry search within the image. [A856]

"Power harvesting device"

Techniques are described to harvest power from a single current carrying conductor to furnish power to a powered device. The techniques employ a power harvesting device that is coupled to the conductor. In implementations, the conductor has a first path and a second path. The power harvesting device includes a first switch coupled to the second path. An energy storing element is coupled to the first path and configured to store energy based upon the direct current flowing through the first path. The power harvesting device also includes a power condition and management device coupled to the energy storing element configured to switch the first switch to a closed configuration when the energy storing element is measured to have a predefined high voltage threshold, and to switch the first switch to an open configuration when the energy storing element is measured to have a predefined low voltage threshold. [A857]

"Techniques for reporting on or tracking ground vehicles"

Ground vehicle reporting and tracking techniques are provided to track vehicles associated with a particular area (e.g., an airport, a military base, etc.) . Ground vehicles may regularly report information about the vehicle to one or more control stations via corresponding communication links. The communication links may include, for example, an Automatic Dependent Surveillance-Broadcast (ADS-B) link and a non-ADS-B link. [A858]

"Method and arrangement for removing ground clutter"

A digital radar receiver generates the input signal which is a stream of complex numbers. The input signal is rearranged and sorted by measurement volumes, resulting in Doppler data vectors. Doppler data vectors are filtered using a number of different digital filters. The output Doppler data vectors of the filters together with the original Doppler data vector are the candidate signals. Each candidate signal is analyzed using several criteria in order to find the one signal which is most likely to be caused by precipitation and has the ground clutter removed by the filtering. The selected signal is then used to calculate the meteorological products. The selected signal is also used to derive a velocity value or velocity distribution while taking into account the effects of the filtering performed earlier. [A859]

"Transportable X-band radar having antenna mounted electronics"

A transportable weather radar having radar electronics functionally located above the elevational joint and a frame superstructure rotationally connected to the elevational joint onto which is mounted a parabolic radar antenna adapted for Doppler weather radar use. The radar has a rotational drive assembly mounted below and supporting the elevational joint and a harmonic drive unit positioned inside the elevational joint so that the antennae may be rotated without significant backlash during rotational changes. A hollow center in the rotational joint allows for the passing of electronics cable through the middle of the joint and down through rotating assemblies and to electronics in or adjacent to the radar pedestal. [A860]

"Method for detecting a distance, a radar system and a computer program product"

The invention relates to a method for detecting a distance between a radar system and a reflecting surface. The method comprises the steps of transmitting a frequency modulated continuous wave (FMCW) radar signal from the radar system and receiving a reflected FMCW radar signal being the transmitted signal that has been reflected by the reflecting surface. Further, the method comprises the steps of providing a beat signal having a frequency that is equal to the frequency difference between the transmitted signal and the received signal and determining harmonics of the beat signal. The method also comprises the step of using phase shift information of at least one of said harmonics for determining a distance between the radar system and the reflecting surface. [A861]

"Radar apparatus and signal processing method"

There is provided a radar apparatus. A derivation unit derives this time-decided transverse distance of the target of this time processing, by filtering, with a predetermined filter constant, this time transverse distance of paired data of this time processing, and a predicted transverse distance. A change unit changes, when the transverse distance of an object moving target moving in a traveling direction of a vehicle mounted with the radar apparatus and the transverse distance of a specific target satisfy a predetermined relation, the filter constant for filtering this time transverse distance and the predicted transverse distance of the object moving target so that a reflection amount of this time transverse distance is reduced in comparison to before the change. [A862]

"Sensor mounting for a sensor for object detection"

A sensor mounting for a sensor for object detection includes a housing for the sensor, a holder on which the housing is pivotably held, an adjusting device for an angular orientation of the housing and an angular gear mechanism for controlling the adjusting device. The angular gear mechanism includes a drive wheel and a driven wheel, the drive wheel being connected to an engagement contour for the transmission of torque to the drive wheel, and a gear mechanism housing of the angular gear mechanism being set up so as to permit mounting of the drive wheel at different sides of the angular gear mechanism. [A863]

"Photoconductive antenna, terahertz wave generating device, camera, imaging device, and measuring device"

A photoconductive antenna is adapted to generate terahertz waves when irradiated by pulsed light. The photoconductive antenna includes first and second conductive layers, a semiconductor layer positioned between the first and second conductive layers, first and second electrodes, and a dielectric layer. The semiconductor layer is made of a semiconductor material having a carrier density that is lower than a carrier density of the semiconductor material of the first conductive layer or the second conducive layer. The first and second electrodes are electrically connected to the first and second conductive layers, respectively. The second electrode has an aperture through which the pulsed light passes. The dielectric layer is made of a dielectric material, and is in contact with a surface of the semiconductor layer having a normal direction extending orthogonal to a lamination direction of the first conductive layer, the semiconductor layer, and the second conductive layer. [A864]

"Methods, devices, and systems for improving dynamic range of signal receiver"

Methods, devices, and systems that may help improve the dynamic range of a signal receiver. The method includes (i) causing a signal emitter to emit a signal during a first period of time, (ii) receiving, at the signal receiver, a reflected signal during a second period of time, where the received reflected signal corresponds to the emitted signal, and where the second period of time begins after a beginning of the first period of time, and (iii) increasing a signal gain that is applied to the received reflected signal during a third period of time, where the third period of time begins not earlier than a beginning of the second period of time. [A865]

"Motor vehicle with a radar mechanism and procedure for the operation of a radar mechanism"

The invention relates to a motor vehicle with a radar device (3, 4) which is designed for detecting an object (25) located in a detection zone (7, 8) of the radar device (3, 4) , wherein the detection zone (7, 8) is defined by an elevation angle zone (.delta..sub.1, .delta..sub.2) and an azimuth angle zone (.alpha.) , wherein the elevation angle zone (.delta..sub.1, .delta..sub.2) also covers at least such a partial angle zone (.delta..sub.1) which lies within an angle interval of 15.degree. to 90.degree. above a horizontal (33) defined with respect to the motor vehicle (1) . [A866]

"Range rate based stopped detection"

Methods, devices, and systems are described for determining whether a mobile device is in a stopped state based at least in part on round trip time (RTT) measurements between the device and at least one access point. The stopped state determination may be based on RTT measurements alone, or on RTT measurements in combination with other positioning and movement measurements. Further, filtering such as particle and Kalman filtering may be used to improve determination of whether the device is in a stopped state. [A867]

"Gesturing architecture using proximity sensing"

Proximity based system and method for detecting user gestures. Each of a plurality of proximity sensing circuits may collect digital data. Each proximity sensing circuit may include an antenna configured to transmit and receive electromagnetic signals and a shield driver configured to shield signals transmitted by the antenna in one or more directions. The digital data may be collected based on electromagnetic signals received from another proximity sensing circuit via the antenna. The received electromagnetic signals may be modified by one or more user proximity gestures. The digital data from each of the plurality of proximity sensing circuits may be received by a coordinating circuit. The coordinating circuit may produce coordinated digital data from the digital data received from each of the plurality of proximity sensing circuits. The coordinated digital data may be configured for use in determining that a user performed the one or more user proximity gestures. [A868]

"Electronically steered weather radar"

An electronically steered weather radar system comprises a plurality of transmit/receive modules, a plurality of antenna modules, and a system signal processor. Each transmit/receive module may be configured to adjust a phase characteristic of a radio frequency (RF) signal to be transmitted and received. Antenna modules may be in communication with transmit/receive modules and may form an antenna array configured to transmit a system beam in a direction determined by the phase of the RF signal from each transmit/receive module and to generate the RF signal from the received system beam. The system signal processor may be configured to perform a first scan to detect meteorological formations wherein the system signal processor communicates with each transmit/receive module to adjust a phase characteristic of the RF signals such that the antenna array transmits and receives the system beam through a plurality of azimuth angles and a plurality of elevation angles. [A869]

"System and method for collecting and organizing information related to utility assets"

A method and system for collecting information related to utility assets include determining a position of an underground utility asset by a location determining device, integrating location data from a Global positioning system (GPS) receiver with the determined position of the underground utility asset to provide information about coordinates of the position of the underground utility asset, adding characteristics of the underground utility asset including a size of the underground utility asset, to the integrated data to generate one or more data records including the information about coordinates of the position of the underground utility asset, integrating landbase data with the data records for the underground utility asset, and displaying a scrolling map including the data records and a portion of the landbase data. [A870]

"Method and apparatus for detecting subsurface targets using data inversion and a temporal transmission line model"

A method and apparatus for detects one or more subsurface targets by receiving a reflectivity data from two or more subsurface reflectors using a ground penetrating radar. The two or more subsurface reflectors may include the one or more subsurface targets and a medium surrounding the one or more subsurface targets. An impedance data for the two or more subsurface reflectors is calculated by inverting the reflectivity data using a temporal transmission line model with a "layer-peeling" method. One or more constitutive parameters of the two or more subsurface reflectors are calculated based on the impedance data. The one or more subsurface targets are detected based on a change in the one or more constitutive parameters. [A871]

"Antenna blockage detection"

A system includes an antenna having a substrate and a plurality of antenna elements disposed on the substrate. A processing device is configured to measure an aperture function across an aperture of the antenna and determine whether at least one of the antenna elements is blocked based at least in part on the measured aperture function. [A872]

"Multi-path mitigation in rangefinding and tracking objects using reduced attenuation RF technology"

An autonomous system with no Customer Network Investment is described, wherein the system is configurable to operate on in a band in addition to the LTE band. Such system allows the definition of hybrid operations to accommodate the positioning reference signals (PRS) of LTE and already existing reference signals. The system can operate with PRS, with other reference signals such as cell-specific reference signals (CRS) , or with both signal types. As such, the system provides the advantage of allowing network operator (s) to dynamically choose between modes of operation depending on circumstances, such as network throughput and compatibility. [A873]

"Traffic flow measuring apparatus and method, and computer-readable storage medium for judging

size of vehicle depending on number of times reflected wave from vehicle is detected within detection time"

A traffic flow measuring apparatus includes a processor configured to judge a size of a vehicle, depending on a detection frequency or a non-detection frequency of a reflected wave from the vehicle with respect to a transmission wave transmitted from a radar apparatus, within a detection time of the reflected wave from the vehicle, set according to the detection of the reflected wave. [A874]

"Method and apparatus for localization of RFID tags"

A method and apparatus for an RFID tag to facilitate the determination of its location while at the same time minimizing the energy drain on the tag's battery. At predetermined intervals, the tag transmits its identifier along with status information. If the status indicates that the tag is in a new location, the tag will then expend additional battery energy by participating in the determination of its location. The distance from an interrogator to the tag is determined by transmitting two signals from the interrogator that propagate at different velocities. By determining the difference in arrival times at the tag of the two signals, the distance from the interrogator to the tag can be determined. [A875]

"Multiplatform GMTI radar with enhanced SNR, monopulse"

The present invention is directed to a ground moving target (GMTI) radar that can detect targets, including dismounts, with very small minimum detectable velocities by combining signals from antennas on different spatially separated platforms in a main beam clutter-suppressing spatially adaptive process without requiring that the relative positions of the antenna phase centers be accurately tracked. The clutter nulling is in addition to that provided by the Doppler filters. The spatial displacement provides a narrow mainbeam clutter null reducing undesired target suppression. The clutter-suppressing spatially adaptive structure is used in both the sum and delta channels of the monopulse processor so that the beam distortion caused by the spatial nulling is compensated for, and the monopulse look-up process is preserved to maintain angle accuracy. Noncoherent integration is employed to recover signal to noise loss resulting from the uncertain relative locations of the platforms. [A876]

"Radar apparatus, vehicle control system, and signal processing method"

There is provided a radar apparatus. A setting unit is configured to set a first range including at least a reference target. A deriving unit is configured to derive a representative position of targets included in the first range on the basis of position information of the targets included in the first range. An acquiring unit is configured to acquire vehicle information indicating that the vehicle is running in a curve-shaped lane or a road shape in front of the vehicle is a curve shape. When the acquiring unit acquires the vehicle information, the setting unit sets a second range wider than the first range and the deriving unit derives a representative position of targets included in the second range on the basis of position information of the targets included in the second range. [A877]

"Object detection assembly"

A object detection assembly for remotely sensing an underground object includes a mount that is operationally coupled to an excavator bucket. An upper plate is coupled to the mount. A transceiver is coupled to the upper plate. The transceiver may detect an object when the excavator bucket excavates Earth. The transceiver is operationally coupled to a vehicle. The transceiver alerts a driver of the vehicle to the presence of the object. A lower plate is coupled to the mount. [A878]

"Method and device for estimating direction of arrival"

A method for determining a DOA (Direction of Arrival) comprises the following steps: (a) providing at least two antennas arranged with a squint angle, (b) producing at least two base beams between two adjacent base beams, (c) every two virtual beams of the multiple virtual beams which cross together at a specific angle are define to a virtual beam set, (d) synthesizing the two virtual beams of each one of the virtual beam sets to be a monopulse, and (e) determining the DOA of the object according to comparison between magnitude of demodulated signals corresponding to the monopulses. A device for estimating a DOA is also disclosed. [A879]

"Radar false alert reduction"

A radar detector suppresses alerts from vehicle guidance systems, by sweeping for a consistent radar signal, the center frequency of the signal is stored and the detector suppresses warnings of radar signals near that frequency. The detector uses an enhanced method for suppression of signals near a known location of a false signal source, in the event the detector detects a radar signal and finds a matching stored false signal, the detector will first compare the strength of the received signal to a threshold strength that is computed based upon the distance of the detector from the stored false signal, and will only suppress signals below threshold. The detector includes a camera directed to the road in the vicinity of the vehicle. Image data from the camera is processed to identify police vehicles as identified by flashing lights, a profile including a rooftop light bar and/or highly contrasting colored panels. [A880]

"Method and device for calibrating and adjusting a vehicle surroundings sensor"

A method for adjusting and/or calibrating a surroundings sensor in a vehicle using a measuring unit and a calibration panel. [A881]

"Adjustable holding device for sensors"

An adjustable holding device for sensors includes a main body, on and opposite of which, a bearing body supporting a sensor is adjustably held by a spherical joint. The spherical joint includes a threaded stud, fastened to the main body, that protrudes through an opening in the bearing body, and to which an opening in a body having a spherical outer surface is screwed. The outer surface is held pivotably in and co-rotatably with, about an axis coaxial with the threaded stud, complementarily spherical inner surfaces of two combined half-shells. Through rotation under external force of the combined half-shells, the body having the spherical outer surface can be screwed relative to the threaded stud by displacing the half-shells and the bearing body in the threaded stud direction. [A882]

"Autonomous mobile robot"

A robot includes a robot body having forward and rearward portions, a sonar system, a drive system, and a control system. The sonar system is disposed on the robot body and has an array of emitters and an array of receivers arranged along a forward surface of the forward portion of the robot body. The emitters emit a sound wave and the receivers receive reflections of the sound wave. The array of emitters includes an odd number of emitters and the array of receivers includes an even number of receivers. The drive system supports the robot body and is configured to maneuver the robot across a floor surface along a path. The control system is supports by the robot body and is in communication with the drive system and the sonar system. The control system processes sensor signals received from the array of receivers. [A883]

"Sound source detection apparatus"

In a sound source detection apparatus that detects a sound source of a detection subject on the basis of collected sounds, sounds are collected by at least one sound collector, an autocorrelation between sounds collected in time series by the sound collector is calculated, and a determination as to whether or not the sound source of the detection subject exists is made on the basis of the autocorrelation. More particularly, sounds are preferably collected respectively by two or more sound collectors such that the existence of the sound source of the detection subject is determined by determining whether or not the autocorrelations of the sounds collected by the two or more sound collectors satisfy a predetermined condition. By using the autocorrelation to detect the sound source of the detection subject in this manner, high robustness against an S/N ratio is exhibited, leading to an improved detection performance when detecting the sound source of the detection subject. [A884]

"Method and device for detecting a starting intention of a stopped vehicle"

In a method for detecting a starting intention of a stopped vehicle, a starting intention criterion is ascertained upon detection of a stopped vehicle, and decision data are formed based on the starting intention criterion, which decision data include an item of information on whether or not the stopped vehicle will start. [A885]

"Synchronization of vehicle sensor information"

A method includes receiving and storing sensor data including a first plurality of data points indicative of a plurality of respective states of the environment external to a vehicle at a plurality of respective times, external data including a second plurality of data points indicative of an additional plurality of respective states of the external environment, and synchronization data. The external data is data that was received by the vehicle from a handheld mobile communication device of a pedestrian external to the vehicle via a wireless link, and is indicative of objects sensed by the handheld mobile communication device. The method also includes generating an animated re-creation of an event involving the vehicle using the stored data, and causing the animated re-creation of the event to be displayed. [A886]

"System for determining the distance from and the direction to an object"

A system for determining the distance from and the direction to an object includes an emitter and at least two receiver elements for receiving a signal which is transmitted by the emitter and reflected by the object. The receiver elements are arranged as a linear array, as two linear arrays situated at an angle to one another, as an array which surrounds the emitter and forms a circle, or as a two-dimensional array. The diameter of the array may be greater than one-half the wavelength of the signal, and the receiver elements each have an individual surface area whose height or diameter corresponds at most to one-half the wavelength of the signal, and the emitter has a height or a diameter which is greater than one-half the wavelength of the signal. [A887]

"Method and apparatus for remote object sensing employing compressive sensing"

A method for remote object sensing on-board a vehicle includes employing compressive sensing to analyze a waveform originating from an on-vehicle low-resolution radar imaging system and reflected from a remote object. The compressive sensing includes generating a matrix including a temporal projection, a Fourier transform, and an integral term configured to analyze the reflected waveform. Leading and trailing edges of the remote object are identified by employing a norm minimization procedure to reconstruct a range profile based upon the reflected waveform analyzed by the compressive sensing. [A888]

"Microwave sensor having function of range gates"

A microwave sensor is disclosed. The microwave sensor includes an active antenna module, a first low pass filter, a second demodulator, a modulation module, and a discrimination control module. The active antenna module is utilized for transmitting a first FMCW signal towards a target and receiving a second FMCW signal reflected back from the target according to a sweep period. The active antenna module includes a loop antenna and a radio frequency transistor. The first low pass filter and the radio frequency transistor form a first demodulator. The first demodulator and the second demodulator perform two-stage down converting and demodulating to extract information for calculating range and velocity, respectively. The present invention adjusts a radio frequency bandwidth of the FMCW signal by first adjusting an amplitude of a modulation signal generated by the modulation module to control various detection ranges. [A889]

"Method for calibrating a plurality of environment sensors in a vehicle"

A method and a device are provided for calibrating a plurality of environment sensors in a vehicle. Traffic light signals are detected and identified from the data of at least one environment sensor or from data received by a car-2-X communication unit. A calibration of the plurality of environment sensors is activated and performed in response to a determination that a traffic light signal pertaining to the vehicle has turned red. [A890]

"Target object detecting device and echo signal processing method"

A target object detection device is provided. The device includes a transmitter for transmitting at least one transmission wave in a predetermined azimuth, an echo signal receiver for receiving echo signals of the transmission waves, an echo signal suppressor for suppressing levels of the echo signals corresponding to sampling positions, a target object detector for detecting the target object (s) based on the level-suppressed echo signals, a first updater for comparing amplitude level (s) of echo signals of sampling positions, with the threshold that is set in association with the first distance, and determining to update the values with a new threshold and a new suppression value, and a second updater for comparing amplitude level (s) of echo signals of sampling positions, with the threshold that is set in association with the second distance, and determining to update the values with a new threshold and a new suppression value. [A891]

"Indoor radio ranging based on a subset of subcarriers employed by orthogonal frequency division multiplexing (OFDM)"

Systems, apparatus and methods for determining a set of ranges from selected subcarriers of an OFDM signal sent between a receiver (e.g., first transceiver or a local receiver of a local unit at a first location) and a transmitter (e.g., second transceiver or remote transmitter of a remote unit at a second location) are presented. The set of ranges is ambiguous as to the correct range. Each range in this set of ambiguous ranges represents a possible range between the transmitter and the receiver. Range ambiguities may be resolved by using additional subcarriers from the OFDM signal and/or using a last know position of a receiver and/or finding ranges to two, three or more transmitters. The range may be used with other ranges to find a location estimate of the receiver. [A892]

"Congestion-friendly adaptive cruise control"

A congestion-based adaptive cruise control (ACC) system for a vehicle. A processor may provide control signals for the vehicle to modify at least one of acceleration, deceleration and braking in the vehicle. A radar sensor arrangement, operatively coupled to the processor, is configured to determine (i) a distance value for a front vehicle based on a front vehicle velocity, and (ii) a distance value for a rear vehicle based on a rear vehicle velocity. The processor may be configured to process (i) and (ii) from the radar sensor arrangement to determine a velocity value for the vehicle, and generate at least one control signal based on the velocity value to alter the velocity of the vehicle using at least one of acceleration, deceleration and braking to position the vehicle substantially at a mid-point between the front vehicle and rear vehicle. [A893]

"Worksite proximity warning"

Systems and methods for warning of proximity in a worksite are disclosed. A second transceiver is detected at a first transceiver, wherein the first transceiver is a mobile wearable device, and wherein the first transceiver and the second transceiver are located at a worksite. An ad-hoc network is established, at the first transceiver, between the first transceiver and the second transceiver. A distance is calculated, at the first transceiver, in three dimensions between the first transceiver and the second transceiver based on the detecting the second transceiver. A first safety envelope is defined, at the first transceiver, about the first transceiver and a second safety envelope about the second transceiver. An alarm is issued, at the first transceiver, when the first safety envelope comes in contact with the second safety envelope. [A894]

"Metamaterial devices and methods of using the same"

Compressive imaging captures images in compressed form, where each sensor does not directly correspond with a pixel, as opposed to standard image capture techniques. This can lead to faster image capture rates due to lower I/O bandwidth requirements, and avoids the need for image compression hardware, as the image is captured in compressed form. Measuring the transformation of an emitted multimodal signal is one method of compressive imaging. Metamaterial antennas and transceivers are well suited for both emitting and receiving multimodal signals, and are thus prime candidates for compressive imaging. [A895]

"Vehicle control apparatus"

A vehicle control apparatus for implementing inter-vehicle distance control of a subject vehicle carrying the apparatus behind a preceding vehicle based on reflected waves from a target of the preceding vehicle. A target-pair distance is a distance between the target and a non-target reflection point that is closer to the subject vehicle than the target. A corrected distance calculator is configured to, in the presence of the target-pair distance being recognized, calculate a first corrected distance by subtracting the target-pair distance from a detected distance between the target and the subject vehicle, and in the absence of the target-pair distance being recognized, calculate a second corrected distance by subtracting an offset that is the previously set target-pair distance from the detected distance. A controller is configured to implement the inter-vehicle distance control based on the first or second corrected distance depending on the presence or absence of the target-pair distance being recognized. [A896]

"Systems and methods for detecting soil characteristics"

A soil detection and planting apparatus. The apparatus includes a vehicle and a controller coupled to the vehicle. The apparatus further includes a planting device coupled to the vehicle, the planting device configured to plant seeds or plants into a soil material. The apparatus includes a ground penetrating radar sensor coupled to the vehicle. The ground penetrating radar soil sensor is configured to scan the soil material up to a designated depth beneath a surface of the soil material, wherein the ground penetrating radar soil sensor is further configured to provide a sensor feedback signal to the controller with respect to an intrinsic characteristic of the soil material. The controller is configured to instruct placement of a seed or a plant into the soil material based on the feedback signal. [A897]

"Composites for antennas and other applications"

Composite material, devices incorporating the composite material and methods of forming the composite material are provided. The composite material includes interstitial material that has at least one of a select relative permittivity property value and a select relative permeability property value. The composite material further includes inclusion material within the interstitial material. The inclusion material has at least one of a select relative permeability property value and a select relative permittivity property value. The select relative permeability and permittivity property values of the interstitial and the inclusion materials are selected so that the effective intrinsic impedance of the interstitial material and the inclusion material match the intrinsic impedance of air. Devices made from the composite include metamaterial and/or metamaterial-inspired (e.g., near-field LC-type parasitic) substrates and/or lenses, front-end protection, stealth absorbers, filters and mixers. Beyond the intrinsic, applications include miniature antennas and antenna arrays, directed energy weapons, EMI filters, RF and optical circuit components, among others. [A898]

"Blind spot detection system"

A blind spot detection system for a vehicle includes a vehicle information detecting module for obtaining at least one vehicle information of the vehicle corresponding to an external environment, an alarm for generating an alarm signal, a plurality of sensors each for emitting a radio signal and receiving a reflecting signal of the transmitted radio signal to detect whether an object exists within a specific range and generate a detection result accordingly, and a control module for controlling the alarm to generate the alarm signal according to the at least one vehicle information and a plurality of detection results generated by the plurality of sensors. [A899]

"Adaptive algorithms for interrogating the viewable scene of an automotive radar"

A radar system in an autonomous vehicle may be operated in various modes and with various configurations. In one example, the radar system determines a target range for further interrogation. The target range may be determined based on the radar system transmitting a first electromagnetic radiation signal and receiving a first reflected electromagnetic signal radiation signal. After the radar system determines a target range, it transmits an electromagnetic radiation signal according to a Frequency Modulated Continuous-wave (FMCW) operating mode. Additionally, the radar system receives a reflected electromagnetic signal radiation based on the transmission.

After receiving the reflected signal, the radar system can process the reflected signal to only have components associated with the target range. The processing of the reflected signal may create a processed signal. Finally, the radar system may determine at least one parameter of a target object based on the processed signal. [A900]

"Signal processing device, radar device, vehicle control system, and signal processing method"

There is provided a signal processing device. Data indicative of a past sensing point, and a counter value indicative of existence possibility of the past sensing point are stored in a storage. Whether the past sensing point has continuity to a recent sensing point is determined. The counter value associated with the past sensing point determined as having no continuity to the recent sensing point is decreased. The data is deleted from the storage means when the counter value becomes less than a first threshold value. The sensing point possibly detected by pairing peak signals obtained in first and second periods in a wrong manner is identified as a specific sensing point. A first value is decreased from the counter value associated with the past sensing point, and a second value different from the first value is decreased from the counter value associated with the specific sensing point. [A901]

"Systems and methods for calibrating dual polarization radar systems"

A dual polarization radar system is calibrated based on real-time data measurements, such as measured horizontal and vertical reflectivities, Z.sub.H and Z.sub.V. In this regard, the radar system analyzes the reflected power measurements to identify which measurements are associated with reflections from a respective spherical object. Using such measurements, the system determines a system differential reflectivity value, and combines such value with reflected power measurements for calibration. Since the calibration is based on real-time data measurements, the calibration process may run simultaneously with the collection of weather data. Thus, it is unnecessary to suspend weather monitoring activities in order to perform the calibration, and the calibration can be run as often as is desired without interfering with such weather monitoring activities. Further, the calibration process is immune to the weather events within range of the radar system. Accordingly, it is possible for the calibration to be performed at any time and without interfering with the weather monitoring activities regardless of the types of weather events occurring within the vicinity of the radar system. [A902]

"Vehicle control apparatus"

A vehicle control apparatus for implementing inter-vehicle distance control of a subject vehicle carrying the apparatus behind a preceding vehicle based on reflected waves from a target that is a reflecting portion of the preceding vehicle. In the apparatus, a distance estimator is configured to calculate an estimated distance as an inter-vehicle distance between a rear end of the preceding vehicle and the subject vehicle based on an inter-vehicle distance variation calculated based on a relative speed of the target. A target determiner is configured to determine whether or not the target is displaced forward of the rear end of the preceding vehicle. A controller is configured to, when the target of the preceding vehicle is displaced forward of the rear end of the preceding vehicle, implement the inter-vehicle distance control based on the estimated distance calculated by the distance estimator. [A903]

"Vehicle control apparatus"

A vehicle control apparatus for implementing inter-vehicle distance control of a vehicle carrying the apparatus behind a preceding vehicle. In the apparatus, an offset storage is configured to calculate an offset that is a difference between detected distances to first and second targets, and store the offset associated with the first target forward of the second target. The inter-vehicle distance control may be implemented based on a distance calculated by subtracting the offset from the detected distance to the first target. An offset eraser is configured to, based on the presence or absence of relative displacement between the first and second targets, determine whether or not the first and second targets belong to different vehicles, and when the first and second targets belong to different vehicles, erase the offset stored by the offset storage. [A904]

"False warning reduction using location data"

A collision warning system for a host vehicle includes a false warning reduction arrangement. A collision sensor senses a presence of a target object within a forward path of a vehicle and a navigation system senses the global position of the vehicle. The collision warning system receives the location information and the target object to provide a collision warning to a vehicle operator. To avoid false alerts, the collision warning system compares target object and location to target objects and locations stored in a false alert database. When the target object is provided in the database, a warning is delayed or suppressed. The collision warning system also senses driver reactions to a warning. When a warning results in no reaction by a vehicle operator, the warning is considered a false alert, and the target object and location are stored in the false alert database. [A905]

"Tracking on-road vehicles with sensors of different modalities"

A vehicle system includes a first sensor and a second sensor, each having, respectively, different first and second modalities. A controller includes a processor configured to: receive a first sensor input from the first sensor and a second sensor input from the second sensor, detect, synchronously, first and second observations from, respectively, the first and second sensor inputs, project the detected first and second observations onto a graph network, associate the first and second observations with a target on the graph network, the target having a trajectory on the graph network, select either the first or the second observation as a best observation based on characteristics of the first and second sensors, and estimate a current position of the target by performing a prediction based on the best observation and a current timestamp. [A906]

"Object fusion system of multiple radar imaging sensors"

A method of detecting and tracking objects using multiple radar sensors. Objects relative to a host vehicle are detected from radar data generated by a sensing device. The radar data includes Doppler measurement data. Clusters are formed, by a processor, as a function of the radar data. Each cluster represents a respective object. Each respective object is classified, by the processor, as stationary or non-stationary based on the Doppler measurement data of each object and a vehicle speed of the host vehicle. Target tracking is applied, by the processor, on an object using Doppler measurement data over time in response to the object classified as a non-stationary object, otherwise, updating an occupancy grid in response to classifying the object as a stationary object. [A907]

"Predictive reasoning for controlling speed of a vehicle"

Methods and systems for predictive reasoning for controlling speed of a vehicle are described. A computing device may be configured to identify a first and second vehicle travelling ahead of an autonomous vehicle and in a same lane as the autonomous vehicle. The computing device may also be configured to determine a first buffer distance behind the first vehicle at which the autonomous vehicle will substantially reach a speed of the first vehicle and a second buffer distance behind the second vehicle at which the first vehicle will substantially reach a speed of the second vehicle. The computing device may further be configured to determine a distance at which to adjust a speed of the autonomous vehicle based on the first and second buffer distances and the speed of the autonomous vehicle, and then provide instructions to adjust the speed of the autonomous vehicle based on the distance. [A908]

"Removable dashboard instrument system"

An instrument system for a vehicle in which information regarding the operation of the vehicle is displayed on the display of a portable communication device. Information regarding the operation of the vehicle may be sensed by at least one sensor. The sensed information may be communicated to a vehicle controller and/or transmitted to the portable communication device. The sensed information may be used by the vehicle controller and/or the portable communication device to derive information regarding the performance or operation of the vehicle and displayed on the display. The portable communication device may also retrieve or derive other information relating to the operation of the vehicle, such as information obtained from a remote server, and display the additional information for the user of the vehicle. The vehicle may be configured to receive the secure placement of the portable communication device in the vehicle, such as on a dashboard. [A909]

"Probabilistic target selection and threat assessment method and application to intersection collision alert system"

A system and method for providing target selection and threat assessment for vehicle collision avoidance purposes that employ probability analysis of radar scan returns. The system determines a travel path of a host vehicle and provides a radar signal transmitted from a sensor on the host vehicle. The system receives multiple scan return points from detected objects, processes the scan return points to generate a distribution signal defining a contour of each detected object, and processes the scan return points to provide a position, a translation velocity and an angular velocity of each detected object. The system selects the objects that may enter the travel path of the host vehicle, and makes a threat assessment of those objects by comparing a number of scan return points that indicate that the object may enter the travel path to the number of the scan points that are received for that object. [A910]

"Target detection utilizing image array comparison"

A method and system for forming an image comprising at least one processor for performing the following: initializing an N by P image array I.sub.O by setting all values to a large number, inputting at least one image frame, randomly selecting and removing a subset of pixel locations from the total number of available pixel locations to form a preliminary image array I.sub.C, for each pixel location comparing the complex magnitude of each pixel in the image array I.sub.O with the magnitude of the corresponding pixel in image array I.sub.C, and if the pixel value in the image array I.sub.C is smaller than the corresponding pixel in the image array I.sub.O or if the I.sub.C value equals 0, then the current pixel value in image array I.sub.O is replaced by the pixel value in the image array I.sub.C, and repeating for a number of iterations to form an image. [A911]

"Methods and apparatus for 3D radar data from 2D primary surveillance radar and passive adjunct radar"

Methods and apparatus for combining radar signals of a two-dimensional primary radar covering a surveillance area and a passive adjunct radar to provide three-dimensional data for targets and weather. In exemplary embodiments, high beam and low beam data from the primary radar and elevation data from the adjunct radar can be used to mitigate interference from clutter, such as wind farms. [A912]

"Driver assistance system for a vehicle"

A driver assistance system for a vehicle includes a forward facing and a control having an image processor that processes image data captured by the camera. At least in part responsive to processing by the image processor, an alert to a driver of the equipped vehicle is generated based upon at least one of (i) detection of an inappropriate lane change maneuver of the equipped vehicle and (ii) a detection of a potential impact with another vehicle. The image processor processes image data captured by the forward facing camera to detect a traffic control device present within the field of view of the forward facing camera, and the system may generate an alert to the driver when it is determined that the vehicle is not appropriately responding to the detected traffic control device. [A913]

"Method and device for the position determination of objects in road traffic, based on communication signals, and use of the device"

The invention relates to a method for the communication signal-based position determination of objects in road traffic, in which at least one data transporting communication signal is wirelessly transmitted from at least one sender (217, 218, 219, 220, 221, 34) and is reflected at least proportionally as a reflection signal on at least one object (211, 212, 213, 214, 215, 216, 35) , wherein the at least one communication signal and the reflection signal are received by a receiver (222, 33) , and wherein the of at least one sender (217, 218, 219, 220, 221, 34) . The method is characterized in that a propagation time difference of the communication signal and the reflection signal is determined by the received (222, 33) . The invention further relates to a corresponding device (100) and to the use thereof. [A914]

"Method for unambiguously determining a range and/or a relative speed of an object, driver assistance device and motor vehicle"

A method for unambiguous determination of a range to and/or of a relative velocity of an object with respect to a motor vehicle is disclosed. An unambiguity area (RUn) for the range and/or an unambiguity area (VUn) for the relative velocity may be determined by means of a frequency-modulation continuous-wave radar in the motor vehicle, with a predetermined sequence of frequency-modulated signal pulses being transmitted by the frequency-modulation continuous-wave radar in a measurement cycle. Mutually different unambiguity areas (RUn) for the range and/or mutually different unambiguity areas (VUn) for the relative velocity are defined for at least two successive measurement cycles, and the range and/or the relative velocity are/is determined on the basis of, in each case, at least one measured value for the range and/or for the relative velocity from each measurement cycle. [A915]

"Weather radar threat depiction system and method"

A method and system can display images associated with core threats, associated threats, and/or predictive overflight threats. The images of the weather can be displayed using at least a first color, a second color, and a third color associated with a respective first precipitation rate range, a second respective precipitation rate range, and a third respective precipitation rate range. The first precipitation rate range is less than the second precipitation rate range and the third precipitation rate range is more than the second precipitation rate range. The core threats, associated threats and predictive overflight threats can be displayed using the first, second and third colors, speckled areas, and wedge-shaped symbols. [A916]

"Radio frequency identification in safety applications"

Aspects of the present invention provide an RFID system for safely controlling an auto guided vehicle, an automated robot or other moving object ("AGV") . The system may include a plurality of radio frequency identification ("RFID") tags, and each may store a unique identification in a first memory location, a position in a second memory location and/or an instruction in a third memory location. An AGV having an RFID transceiver or antenna and a computer with a non-transitory computer-readable storage medium containing a predetermined table may read one or more of the memory locations. The table comprises a plurality of data elements with certain data elements associated with particular RFID tags. The AGV safely determines its location upon matching the one or more memory locations read with one or more data elements, or triggers a fault upon failing to match. The AGV may also predict the next RFID tag. [A917]

"Detecting roadway targets across beams"

The present invention extends to methods, systems, and computer program products for detecting targets across beams at roadway intersections. Embodiments of the invention include tracking a target across a plurality of beams of a multiple beam radar system in a roadway intersection and updating track files for targets within a roadway intersection. Returns from a plurality of radar beams monitoring a roadway intersection are divided into range bins.

Identified energy in the range bins is used to compute the position of targets within a roadway intersection. When the position of a target is computed, it is determined if the position is a new position for an existing target or if the position is the position of a new target. [A918]

"Target tracking"

An apparatus and a method are disclosed for tracking a plurality of targets (e.g. land-based vehicles) . The method can include: for a first time-step, estimating a state of each respective target, at a second time-step, measuring values for a state of each target, for the second time-step, estimating a state of each target using the estimated target states for the first time-step, updating the estimated target states for the second time-step by performing a Joint Probabilistic Data Association process using the measured values, and performing an identity management process to estimate a probability that a particular state measurement corresponds to a particular. [A919]

"Attribute and topology based change detection in a constellation of previously detected objects"

A system that applies attribute and topology based change detection to networks of objects that were detected on previous scans of a structure, roadway, or area of interest. The attributes capture properties or characteristics of the previously detected objects, such as location, time of detection, size, elongation, orientation, etc. The topology of the network of previously detected objects is maintained in a constellation database that stores attributes of previously detected objects and implicitly captures the geometrical structure of the network. A change detection system detects change by comparing the attributes and topology of new objects detected on the latest scan to the constellation database of previously detected objects. [A920]

"Driver assistance system for avoiding collisions of a vehicle with pedestrians"

A driver assistance system for avoiding collisions of a vehicle with pedestrians, the system including a camera sensor and/or a beam sensor. When an object moving at a given speed on a pedestrian crossing is detected, the object is detected as being a pedestrian with a probability that is sufficiently high to output a warning to the driver, reducing the likelihood of a potential collision. [A921]

"Method and devices for processing radar signals"

A method for processing signals received by a plurality of receiving antennas in a radar system, for example for road safety, which emits sequences of chirp-modulated signals, wherein the received signals are mixed with local replicas of the transmitted signals so as to generate, for each receiving antenna, a sequence of detection signals. The detection signals are subjected to Fourier-transform processing and beam-forming processing for generating values of range, azimuth, and speed for at least one obstacle or "target" detected by the radar system. The method includes an acquisition process for yielding approximate values of range and azimuth of the obstacle, and a tracking process for yielding accurate range, azimuth and speed values of the obstacle itself. [A922]

"Methods, apparatus, and systems for providing an enhanced positive response for underground facility locate and marking operations based on an electronic manifest documenting physical locate marks on ground, pavement or other surface"

A positive response notification to provide information regarding locate and/or marking operations for underground facilities may include time-stamp information to provide proof of a time at which the locate and/or marking operation was completed by a locate technician, and/or place-stamp information to provide proof of a presence of the locate technician at or near a work site. An electronic manifest image and/or a virtual white line image similarly may be included in a positive response notification. In one example, such images may be bundled together based on respective descriptor files (or descriptor metadata) that associates the corresponding images with a locate request ticket for the operation. In another example, a positive response notification may include environmental information regarding one or more environmental conditions present at or near the work site during the locate and/or marking operation. [A923]

"Method and system for predictive vehicle systems performance selection for enhanced maneuverability"

A predictive enhanced maneuverability system providing enhanced timely delivery of vehicle performance selection of chassis, and steering modes for potential predicted safety collisions is disclosed. The primary inputs of the disclosed invention include a determination of the proximity to a preceding vehicle, the density of the surrounding traffic, a forward collision warning alert, and the predictive enhanced maneuverability decision sub-system for vehicle mode selection. The system of the disclosed invention provides a customized vehicle dynamics chassis and steering dynamic mode output, based on a predicted decision about vehicle potential for collision, for improved driver maneuverability and safety. In addition, the disclosed invention provides an improved system and method for incorporating the time dependent headway, forward collision warning alert, and the traffic density for chassis collision-mode embedded decision-making. The predictive enhanced maneuverability decision-module allows vehicle dynamics mode selection to be tailored based on proximity to a potential collision. [A924]

"Systems and methods for adaptive vehicle sensing systems"

An adaptive sensing system is configured to acquire sensor data pertaining to objects in the vicinity of a land vehicle. The adaptive sensing system may be configured to identify objects that are at least partially obscured by other objects and, in response, the adaptive sensing system may be configured to modify the configuration of one or more sensors to obtain additional information pertaining to the obscured objects. The adaptive sensing system may comprise and/or be communicatively coupled to a collision detection module, which may use the sensor data acquired by the adaptive sensing system to detect potential collisions. [A925]

"Method and apparatus for matching vehicle ECU programming to current vehicle operating conditions"

Disclosed herein are techniques for implementing vehicle ECU reprogramming, so the ECU programming, which plays a large role in vehicle performance characteristics, is tailored to current operational requirements, which may be different than the operational characteristics selected by the manufacturer when initially programming the vehicle ECU (or ECUs) with specific instruction sets, such as fuel maps. In one embodiment, a controller monitors the current operational characteristics of the vehicle, determines the current ECU programming, and determines if a different programming set would better suited to the current operating conditions. In the event that the current programming set should be replaced, the controller implements the ECU reprogramming. In a related embodiment, users are enabled to specify the ECU programming to change, such as changing speed limiter settings. [A926]

"Sensor assembly for driver assistance systems in motor vehicles"

A sensor assembly is described for driver assistance systems in motor vehicles, having a radar sensor and a video camera, in which the radar sensor and the video camera are integrated into a common housing. [A927]

"Systems and methods for performing wingtip protection"

Systems and methods for creating a narrow vertical pathway of detection that permits the enforcement of a fixed "exclusion zone" that is narrow and does not widen with range. An advantage to this approach is that the zone or corridor does not widen with range, permitting a fixed exclusion zone that will ignore items that will pass above or below the wing. An exemplary system located on a vehicle includes at least two vertically separated antennas that receive radar reflection signals, a processor, and an output device. The processor receives the radar reflection signals received by the antennas, determines vertical position of any obstacles identified in the radar reflection signals and determines if the obstacles are within a predefined alert zone. The output device outputs an alert if any obstacle is within the alert zone. The predefined alert zone is related to a protruding portion of the vehicle. [A928]

"Omnidirectional retrodirective antennas"

Embodiments of the invention are directed to retrodirective radio-frequency systems wherein a transmit antenna array includes at least one row of N transmit elements and a receive antenna array includes at least one row of N receive elements that correspond one-to-one to the transmit elements and wherein the transmit and receive elements are located on spaced planes, and centered about a common axis and located at common transmit distance and a common receive distance, respectively. In some embodiments the one row of transmit and receive elements comprises "n" rows of elements, where "n" is an integer greater than one, thereby forming a two-dimensional array. In some embodiments the total transmit radiation pattern provides an azimuth coverage of 360 degrees. In other embodiments, it may provide less coverage but be operable as independent sectors. In some embodiments, the desired transmit wave form will be identical between all transmit elements of the array, one possible example being pseudo random noise imparted on a sinusoidal carrier. [A929]

"Detection of radar objects with the aid of a radar sensor of a motor vehicle"

A method and a system for detecting radar objects with the aid of an angle-resolving radar sensor of a motor vehicle in the presence of an object which extends in the driving direction laterally next to the motor vehicle's own lane and reflects radar waves, a measured position distribution which corresponds to a distribution of azimuth angles of received radar signals of the radar sensor reflected off a radar object being compared to a model of a position distribution which is expected taking into account the presence of the object extending in the driving direction next to the vehicle's own lane, and is a function of a distance from the radar object and a position of a radar object being determined based on the result of the comparison. [A930]

"Adaptive passive scanning and/or active probing techniques for mobile device positioning"

Various methods, apparatuses and/or articles of manufacture are provided which may be implemented to support mobile device positioning through the use of adaptive passive scanning and/or adaptive active probing techniques. for example, a mobile device may acquire signals from wireless transceivers, identify wireless transceivers based, at least in part, on the acquired signal (s) , determine a received signal strength measurement for each of the wireless transceivers based, at least in part, on the acquired signal (s) , and determine a transmission power of a probe signal to be transmitted to at least one of the wireless transceivers based, at least in part, on at least one of the received signal strength measurements. [A931]

"Method for adjusting a self mixing laser sensor system for measuring the velocity of a vehicle"

The method is based on a determination of the orientation of the sensor to the surface moving with respect to the sensor and then acquiring data where the lateral velocity is small and the forward velocity is large. Then, the orientation of the sensor with respect to the direction of the forward velocity is determined and the velocity data subsequently measured are corrected using the measured orientation of the sensor with respect to the reference surface and the forward velocity direction. [A932]

"Travel control device and travel control method"

A travel control device includes a side obstacle detection unit which divides a range from a lateral side to a rear side of a vehicle into plural detection angle areas, and detects, for each of the plural detection angle areas, an obstacle entering the detection angle area, a rearward movement preparation detection unit which detects the vehicle preparing to move rearward, a warning control unit which provides warning about the obstacle if the distance to the obstacle is equal to or less than an activation threshold for the warning, and a threshold control unit which, if the obstacle is detected in one or more rear side areas among the plural detection angle areas, before being detected in the other detection angle areas, raises the activation threshold so that the timing of the warning becomes earlier. [A933]

"Vehicle driving support control apparatus"

A vehicle driving support control apparatus receives lane line information given from a first environment recognizer and information on a target three-dimensional object given from a second environment recognizer. The apparatus estimates the visual range of a driver based on the lane line information, and estimates the driving lane based on at least either one of the lane line information and the target three-dimensional object information, and estimates the driving track of the vehicle. Based on the estimated driving lane and driving track, the apparatus estimates a deviation position where the subject vehicle will deviate from the driving lane on the basis of the driving lane and the driving track estimated. If the deviation position is beyond the visual range, the apparatus executes at least either one of notification to the driver and automatic braking in accordance with the possibility of deviation from the driving lane. [A934]

"System and method for determining the position of an underwater vehicle"

A system and a method are provided for determining the position of an underwater vehicle while the vehicle is operating underwater. A buoyant float stays on or near the surface of the water and is attached to the vehicle by thin tether that can include insulated wires. The vehicle moves under the water and pulls the float behind it. The float can receive a localization signal, such as a signal indicating its GPS position, and so can determine its position precisely. The position can be transmitted to the underwater vehicle over the wires located in the tether. The underwater vehicle can use sensors and/or calculations to determine the positional offset of the vehicle from the float buoy and generates its true position based on the known position of the float and the positional offset. The float can be constructed with attributes that will allow the float it operate with a greater tether length, and in turn allow the underwater vehicle to operate at greater depths. The float may also generally carry a radio system for high speed communication of signals from the vehicle while the vehicle is submerged. [A935]

"System and method for mobile data expansion"

A data expansion system that provides continuum of discrete wireless small cell coverage areas for mobile terminals includes a set of roadway reflectors configured to provide wireless broadband data services to a mobile terminal. Each reflector includes processing circuitry configured to establish communications between the mobile terminal and a backhaul network. Each reflector includes a wireless transceiver configured to transmit and receive data. Each reflector includes a power source that converts solar energy into electricity. Each reflector includes a housing configured to contain the processing circuitry, the transceiver, and the power source. The housing has a raised reflective surface. [A936]

"Surface mapping by virtual array processing via separate transmissions"

A system for measuring the height of bin contents includes transmitters for transmitting pulses of wave energy towards the upper surface of the contents and receivers for receiving echoes of the pulses and producing corresponding signals. The transmitters and receivers are distributed aerially above the contents. The system also includes a processing apparatus, for using the received signals to map the upper surface, that includes correlators that correlate pulse waveforms with the signals, and a beamformer. In one embodiment, the beamformer computes, from the signals considered as corresponding to echoes, of pulses from fewer synthetic transmitters, received at a synthetic receiver array, respective directions of arrival of the signals. In another embodiment, the beamformer computes respective directions of transmission and arrival of the signals, and the processing apparatus also includes a processor that selects, according to the computed transmission and arrival directions, which signals to use for the mapping. [A937]

"Systems and methods for analyzing event data"

A computer-implemented method for determining a target situation in an athletic event. Positional information including the relative positions of a group of selected participants is initially received from a tracking system, and the aggregate motion of the selected participants is detected in real-time using the positional information. The target situation may be determined to have occurred when a change in the aggregate motion occurs in accordance with a predetermined characteristic during an initial time interval. [A938]

"In-field configuration of land survey sensors"

Described herein are implementations of various technologies for a method for in-field configuration of land survey sensors. One or more planned positions of the sensors may be received. One or more actual positions of the sensors may be determined. The actual positions may be sent to the sensors while the sensors are powered off. [A939]

"Processing time determination for wireless position determination"

An example method for determining a processing time for wirelessly determining a position of a mobile station includes: measuring a round trip time delay to each of multiple wireless access points, estimating an initial processing time for each of the wireless access points, calculating the position of the mobile station based upon the measured round trip time delays and estimated processing times, and updating the initial processing time for each of the wireless access points based upon the calculated position of the mobile station. [A940]

"Fuel shut-off command with adaptive cruise control"

Methods and systems for disabling a fuel shut-off state of a vehicle. One method includes counting, by a controller, a number of transitions of an engine included in the vehicle between a fuel shut-off state and a fuel state, determining, by the controller, whether the number exceeds a predetermined threshold, and issuing a disable command, by the controller, to the engine included in the vehicle. The disable command causes the engine to exit a current fuel shut-off state. Another system includes a controller configured to determine whether acceleration is requested while an engine included in the vehicle is in a fuel shut-off state. When acceleration is requested while the vehicle is in a fuel shut-off state, the controller is configured to issue a disable command to the engine prior to issuing an acceleration command. The disable command causes the engine to exit the fuel shut-off state. [A941]

"Enhanced blind spot detection for vehicle with trailer"

A driver assistance method and system senses the presence of a trailer secured to a host vehicle and provides an indication thereof. When a yaw rate for the vehicle exceeds a predetermined value during turning of the host vehicle, the system determines the length of the trailer. To determine trailer length, reflection points from an output of a rear sensor unit are sensed to detect a side wall of the trailer. The farthest reflection point of the trailer is utilized to determine a longitudinal distance and a transverse distance of the trailer with respect to the reflection sensor. The longitudinal distance corresponds to a longitudinal axis of the host vehicle and the transverse axis is transverse to the longitudinal axis. The trailer length is estimated from the yaw rate that provides a trailer angle relative to the host vehicle, and the longitudinal and transverse distances. From the trailer length, the system provides combined blind spot detection zones adjacent the host vehicle, and adjacent to the side of and extending beyond the rear of the trailer. The system also provides lane change assistance. [A942]

"Wave-absorbing metamaterial"

The present invention relates to a wave-absorbing metamaterial, comprising a substrate which is provided with two opposite lateral surfaces, wherein a plurality of periodically arranged artificial metal microstructures are attached on at least one of the two opposite lateral surfaces, when an electromagnetic wave having an incident direction vertical to the two opposite lateral surfaces of the substrate is transmitted to the wave-absorbing metamaterial, a relative permittivity of the metamaterial is substantially equal to a relative magnetic conductivity of the metamaterial. A wave-absorbing principle different from that of a conventional wave-absorbing material is employed on the wave-absorbing metamaterial, an ideal wave-absorbing effect is achieved by periodically arranging various artificial metal microstructures on the substrate and adjusting the artificial metal microstructures, and the wave-absorbing metamaterial has the advantages of minor weight, small thickness and simply adjustable electromagnetic parameters. [A943]

"Methods and systems for detecting weather conditions including wet surfaces using vehicle onboard sensors"

Example methods and systems for detecting weather conditions including wet surfaces using vehicle onboard sensors are provided. An example method includes receiving laser data collected for an environment of a vehicle. The method also includes determining laser data points that are associated with one or more objects in the environment, and based on laser data points being unassociated with the one or more objects in the environment, identifying an indication that a surface on which the vehicle travels is wet. The method may further include receiving radar data collected for the environment of the vehicle that is indicative of a presence of the one or more objects in the environment of the vehicle, and identifying the indication that the surface on which the vehicle travels is wet further based on laser data points being unassociated with the one or more objects in the environment indicated by the radar data. [A944]

"Method and system for producing classifier for recognizing obstacle"

The present invention provides a method and a system for producing a classifier for recognizing an obstacle, including a processor configured to: display surface data of a plurality of obstacles measured by a distance measurement sensor in a two-dimensional (2D) coordinate system, group and classify the surface data displayed in the 2D coordinate system for each obstacle, setting a plurality of feature references to analyze region based features displayed for each obstacle in the 2D coordinate system and calculate the respective feature references for each obstacle grouping, and producing the classifier by applying a weight to each of the feature references. [A945]

"Radar for rejecting and looking past surface reflections"

A multi-modal ground penetrating radar includes a radar set configured to launch predistorted double-sideband (DSB) suppressed-carrier modulated continuous waves (CW) to illuminate and penetrate a ground surface. A variable frequency modulator is connected to modulate a continuous wave (CW) carrier frequency generator within the radar set to yield a double-sideband suppressed carrier output. A lateral single-file array of antennas is configured to be flown closely over the surface of the ground. A multiplexing switch is connected to the array of antennas and configured to selectively switch individual ones of the antennas to the radar set. Any early arriving signals returned from geologic clutter and surface reflections are suppressed in synchronous detection in relation to signals received by the array of antennas from less shallow depths. Interesting objects below the ground surface are detected and located by the late arriving signal reflections. [A946]

"Large area ground monitoring"

A municipal infrastructure maintenance system uses a ground vehicle to move an antenna array in back-and-forth sweeps over large areas or distances. The antenna array comprises dozens of compartmentalized radio dipole antennas arranged laterally, shoulder-to-shoulder across the width of each sweep. An antenna switch matrix is connected between the antenna array and a ground-penetrating-radar (GPR) set and provides electronic aperture switching and selection, and the ability to laterally register one sweep to the next. The antenna array is extended out in front of the ground vehicle on a pivotable boom, and the cantilevered weight is a primary concern. The antenna array is constructed with aluminum-on-aluminum honeycomb panels slotted and folded around dozens of resistive-card compartment separators. Printed circuit boards with matching baluns are also slotted to receive tabs on the resistive cards, and their dipole elements are resistive loaded to quench crosstalk and near field effects. [A947]

"Level measurement instrument fiducial detection method"

A process measurement instrument includes a fiducial and is adapted for detection of the fiducial. The instrument includes an interface circuit comprising a drive circuit for transmitting a pulse signal at the fiducial and at a target of interest and a receive circuit receiving reflected echoes of the pulse signal and developing an analog receive signal representative of the reflected echoes. A processing circuit is operatively coupled to the interface circuit for receiving the analog receive signal and comprising a threshold detector detecting if the analog receive signal is above a select threshold value. A controller is operatively coupled to the processing circuit and responsive to leading and trailing edges of the reflected echo for the fiducial and determining an average of the leading and trailing edges to determine location of the fiducial. [A948]

"Shovel provided with electric swiveling apparatus and method of controlling the same"

A swiveling body is installed on a base in a swivelable manner. An electric motor for swiveling swivels the swiveling body. An inverter supplies electric power to the electric motor for swiveling. An obstacle detector detects an obstacle around the base and transmits a detected result to a control unit. When the obstacle detector detects the obstacle, the control unit determines whether or not the obstacle is present within a monitoring region, and when the obstacle is present inside the monitoring region, the control unit stops the electric motor for swiveling. In order to avoid danger, the swiveling operation can be stopped more safely. [A949]

"Object determination apparatus and collision avoidance assistance apparatus"

An object determination apparatus includes: a sensing device that is mounted in a host vehicle, and that sends detection wave and receives the detection wave reflected from an object, and that detects the object, a detection unit that detects the state of reflection intensity of the detection wave received by the sensing device which changes with the distance to the object, and a determination unit that determines that the object is a vehicle other than the host vehicle when a peak of the reflection intensity exceeds a predetermined threshold value. Peaks of the reflection intensity change in accordance the distance to the object, but the peaks regarding vehicles tend to be higher than the peaks regarding on-road structures. Hence, by comparing a peak of the reflection intensity with the predetermined threshold value, it can be determined whether the detected object is a vehicle other than the host vehicle. [A950]

"Secure electronic compartment identifier system"

A latch, or tag that can be used on luggage, baggage, trunks, rail cars, trailers or any compartment that can be opened and closed that establishes profile data that is associated with the latch or tag and is adapted to store personal data and an identifier in the latch mechanism or on the tag. The profile data can be used to establish a risk factor with the luggage or compartment and/or a person associated with the luggage or compartment. [A951]

"Path planning for evasive steering maneuver employing a virtual potential field technique"

A system and method for calculating a virtual target path that is used to calculate an evasive steering path around a target object, such as a target vehicle, stopped in front of a subject vehicle. The method includes determining a potential field using a plurality of scan points that is a summation of two-dimensional Gaussian functions, where each Gaussian function has center defined by target object scan points and other object scan points. The method identifies a mesh grid in an X-Y plane where the mesh grid includes mesh grid points at locations where X and Y plane lines cross. The method identifies a local minimum point of the potential field for each X-plane line at each mesh grid point along the Y-plane crossing that X-plane line, where the local minimum point is a curve point. The method then connects the curve points to define the target path. [A952]

"Method for monitoring a traffic stream and a traffic monitoring device"

A traffic monitoring device may comprise a radar and a camera, the radar having a radar field of view extending around a radar central axis and the camera having a camera field of view extending around a camera central axis that are both situated in such a manner that the radar field of view is situated within the camera field of view. The radar and the camera may be positioned so that their a central axis of each field of view makes a predetermined angle with respect to the other, the radar being provided for determining coordinates of moving objects within the radar field of view. The device may comprise selecting means a processing unit to provided for selecting within the image an image section or portion, and a data processing unit to for transforming the coordinates of the moving object within the image portion into further coordinates relative to an image reference frame and for to displaying within the image portion an identifier at the further coordinates. [A953]

"System and method for video monitoring of restricted areas below bucket trucks, lineworkers on power distribution poles or other elevated loads"

A method and system (10) are provided for monitoring a restricted area (12) below a temporarily elevated worker (14) working on an elevated power transmission line (16) . The method and system (10) utilize a video camera system (30) that is temporarily elevated to a location (32) adjacent the worker (14) and that is configured to detect the presence of personnel (34) who enter the restricted area (12) . The system (30) is configured to automatically alert personnel (34) at the worksite (17) who enter the restricted area (12) in response to detection of the personnel (34) by the system (30) . [A954]

"Handheld locating device"

A locating device disposable on a surface has a housing, a capacitance sensor, a radar sensor, and an inductance sensor. The locating device also has a motion sensor disposed for detecting at least one motion parameter. A controller receives data from the capacitance sensor, the radar sensor, the inductance sensor and the motion sensor, and determines from the data a presence of objects disposed within or behind the surface. A display is used for displaying a graphical representation of the objects disposed within or behind the surface. [A955]

"Methods and systems for precise vehicle localization using radar maps"

A method for determining a location of a vehicle. The method includes steps of acquiring a plurality of sensor data from a radar sensor associated with the vehicle, obtaining an approximate location of the vehicle using a GPS unit, comparing the sensor data to a database of geo-referenced sensor data, and based on the comparison, determining a location of the vehicle. [A956]

"Measurement device"

Disclosed is a measurement device that can accurately measure size, position, the presence of an object, and the like by means of a simple and low-cost method. Specifically, disclosed is a measurement device that is provided with: a transmitter that transmits radio waves, a vibrating surface that vibrates mechanically, a receiver that receives radio waves, and a controller that transmits radio waves from the transmitter, and on the basis of the signal of the radio waves reflected by the vibrating surface and received by the receiver, outputs information about a measured object on the pathway between the transmitter and the receiver with the vibrating surface therebetween. [A957]

"Mounting for a distance sensor"

A sensor mounting for a distance sensor includes a fixing part for attaching to a vehicle, and a receiving part attached to the fixing part in an adjustable manner in order to receive the distance sensor. The receiving part is adjustable into at least two different angular positions on the fixing part. [A958]

"Target finder, high resolution processing device, and high resolution processing method"

A high resolution processing device that is provided to a target finder for detecting a presence of a target, and that increases resolution of a received signal received by the target finder, includes a first change amount calculator, a second change amount calculator, a coefficient setting component, and an output signal production component. The first change amount calculator calculates as a first change amount an amount of change in the received signal received by the target finder per unit quantity in one direction of an angle direction and a distance direction. The second change amount calculator calculates as a second change amount an amount of change in the first change amount per unit quantity in the one direction. The coefficient setting component sets at least one coefficient based on the first change amount and the second change amount. [A959]

"Electromagnetic reflection profiles"

Methods, systems, and products determine electromagnetic reflective characteristics of ambient environments. A wireless communications device sends a cellular impulse and receives reflections of the cellular impulse. The cellular impulse and the reflections of the cellular impulse may be compared to determine the electromagnetic reflective characteristics of an ambient environment. [A960]

"System and method for distribution free target detection in a dependent non-Gaussian background"

A method for target detection includes: receiving input data via an input signal, generating a histogram from the received data by a processor, rank-ordering the received data based on power or amplitude of the received input signal, comparing the ranked data received in a current time period to the ranked data received in a previous time period to calculate a Bivariate Conditional Exceedance function (BCEF) , utilizing the calculated BCEF to estimate a Gumbel Copula parameter, accumulating a log-likelihood statistic from the estimated Gumbel Copula parameter and the generated histogram, comparing the log-likelihood statistic with a threshold value, and determining a detection of the target, when the log-likelihood statistic is below the threshold value. [A961]

"Radar system and method for providing information on movements of object's surface"

A system for producing an output signal representing movement of an object's surface has a continuous wave (CW) signal source for producing an CW signal directed at the object's surface. The CW signal is produced at a first frequency. A receiving element receives a signal reflected from the object's surface when the CW signal hits this surface. A down-converting frequency mixer converts the received signal into a signal of a second frequency lower than the first frequency. The frequency mixer is configured to produce an output signal representing an amplitude-modulated (AM) component of the received signal and having a parameter representing movement of the object's surface. [A962]

"Travel control device and travel control method"

A travel control device includes rear obstacle detection sensors, side obstacle detection sensors, a warning unit providing warning about an obstacle detected by the sensors, and a control unit controlling the warning unit so that the warning is provided if a distance to an obstacle detected by the rear obstacle detection sensors is equal to or less than a first risk, or if a parameter based on a distance to the obstacle detected by the sensors is equal to or less than a second risk. If the parameter based on the distance to the obstacle detected by the sensors is greater than the second risk, the control unit increases a first warning threshold until a hold time elapses after the sensors become unable to detect the obstacle. [A963]

"Transmit/receive module for electronically steered weather radar"

An electronically steered weather radar system comprises a plurality of transmit/receive modules, a plurality of antenna modules, and a system signal processor. Each transmit/receive module may be configured to adjust the phase of a radio frequency (RF) signal to be transmitted and received. Each antenna module may be in communication with one transmit/receive module. The antenna modules may form an antenna array configured to transmit a system beam in a direction determined by the phase of the RF signal from each transmit/receive module and to generate the RF signal from the received system beam. The system signal processor may be configured to perform a first scan to detect meteorological formations wherein the system signal processor communicates with each transmit/receive module to adjust the phase of the RF signals such that the antenna array transmits and receives the system beam through a plurality of azimuth angles and a plurality of elevation angles. [A964]

"Information technology (IT) equipment positioning system"

An information technology (IT) equipment positioning system comprises a plurality of wireless transponders distributed in multiple locations in the data center and a controller. The controller is adapted to operate the transponders using triangulation to identify and detect positioning according to three-dimensional coordinates for wireless-tagged IT equipment located in the data center. [A965]

"Vehicle radar alignment method and system"

A method and system for aligning a sensor of a radar unit mounted on a vehicle, including calculating at least one alignment measurement of the vehicle from a plurality of optical sensors, positioning a target at a predetermined distance forward of the radar unit and determining a position of the radar unit based on the alignment measurement and the predetermined distance of the target. The method further includes transmitting a beam extending forward from the radar unit and positioning the target and the sensor in alignment with an axis of the beam. [A966]

"Radar system having arrangements and methods for the decoupling of transmitting and receiving signals and for the suppression of interference radiation"

Using a radar system in a motor vehicle, high frequency individual signal pulses are transmitted from at least one transmitting antenna, and at least one receiving antenna receives reception signals formed by reflection of the transmitted signal pulses from objects in the surroundings. The reception signals are mixed with the high-frequency signal to produce low-frequency mixed signals representing the sequence of individual signal pulses. The phase angle of the mixed signals is varied over successive individual signal pulses thereof by varying the phase angle of: the successive individual transmitted signal pulses, the high-frequency signals used for the mixing, and/or the mixed signals. In further processing of the mixed signals to determine the distance and the relative velocity of detected objects, an interference component can be separated and/or suppressed from a useful signal component because the useful signal component has the known phase angle variation but the interference component does not. [A967]

"Method and apparatus for intelligent acquisition of position information"

Improved methods and systems for position acquisition and/or monitoring are disclosed. The position acquisition and/or monitoring can be performed with improved intelligence so that data acquisition, transmission and/or processing is reduced. As a result, the position acquisition and/or monitoring is able to be performed in a power efficient manner. [A968]

"Wireless IC tag, reader-writer, and information processing system"

A wireless IC tag includes a wireless IC chip and two coil-shaped antennas. One end of each of the coil-shaped antennas is electrically connected to the wireless IC chip, and the other ends of the coil-shaped antennas are electrically connected to each other. The winding axes of the coil-shaped antennas are arranged at different positions, and the coil-shaped antennas have the same winding direction. A reader-writer includes an antenna connected to an information processing circuit. The antenna is electromagnetically coupled to the coil-shaped antennas for communication. [A969]

"Driver assistance device for a vehicle and method for operating a radar device"

The invention relates to a driver assistance device (2) for a vehicle (1) , which driver assistance device has a radar appliance (3, 4) for determining at least one measured variable (.alpha..sub.1, .alpha..sub.2, R.sub.1, R.sub.2) referenced to an object (10) that is external to the vehicle, wherein the radar appliance (3, 4) comprises: at least a first and a second reception antenna (14, 15) , each for receiving signals (S.sub.E1, S.sub.E2) , a first down-converter (17) , which is coupled to the first reception antenna (14) via a first reception path (16) , and a second down-converter (23) , which is coupled to the second reception antenna (15) via a second reception path (21) , each for down-converting the received signals (S.sub.E1, S.sub.E2) into respective baseband signals (S.sub.B1, S.sub.B2) , and a control device (5) for receiving the baseband signals (S.sub.B1, S.sub.B2) and for determining the at least one measured variable (.alpha..sub.1, .alpha..sub.2, R.sub.1, R.sub.2) using the baseband signals (S.sub.B1, S.sub.B2) , wherein the radar appliance (3, 4) has test means (32) for producing a local check signal (S.sub.P) and for coupling same check signal (S.sub.P) into the first reception path (16) and/or into the second reception path (21) , as a result of which the control device (5) receives firstly the check signal (S.sub.P) that has been down-converted by the first down-converter (17) as a first test signal (S.sub.T1) and/or secondly the check signal (S.sub.P) that has been down-converted by the second down-converter (23) as a second test signal (S.sub.T2) . The invention also relates to an appropriate method. [A970]

"Object detection method, device and system"

A method and apparatus are provided for detecting an object to be detected. The object is associated with a profile, wherein the profile characterizes the reflection of a signal on the object. The method includes, for a device in a telecommunication network, the acts of selecting a first profile corresponding to a first object to be detected, requesting, based on the first profile, a resource allocation to the communication network, receiving the resource allocation from the communication network, transmitting a signal in the direction of a second object using the allocated resource, receiving a reflected signal, corresponding to the reflection of the transmitted signal on the second object, computing a second profile using the received reflected signal, and indicating the detection of the first object to be detected when the second profile matches the first profile. [A971]

"Path planning for evasive steering maneuver in presence of target vehicle and surrounding objects"

A method for calculating a virtual target path around a target object that includes providing scan points identifying detected objects and separating the scan points into target object scan points and other object scan points. The method identifies a closest scan point from the target object scan points and identifies a path point that is a predetermined safe distance from the closest scan point. The method determines a straight target line adjacent to the target object that goes through the path point, and determines a distance between the target line and each of the other objects and determines whether all of the distances are greater than a predetermined threshold distance. The method identifies curve points for each other object whose distance is less than the predetermined threshold distance, and identifies a curve path that connects the curve points to be the virtual target path using a quadratic polynomial function. [A972]

"Driver assistance system for a vehicle, vehicle having a driver assistance system, and method for assisting a driver in driving a vehicle"

The invention relates to a driver assistance system for a vehicle (1) , wherein the driver assistance system has at least one controller (2, 4, 6, 9, 11, 14) installed in the vehicle (1) and/or at least one sensor device (16, 17, 18, 19) installed in the vehicle (1) , wherein the at least one controller (2, 4, 6, 9, 11, 14) and/or the at least one sensor device (16, 17, 18, 19) has a communication interface (21) which can be used to transmit data directly between the controller (2, 4, 6, 9, 11, 14) and/or the sensor device (16, 17, 18, 19) and a portable communication appliance (22) at least in one direction by bypassing a data transmission system (20) inside the vehicle, wherein the data transmission causes the portable communication appliance (22) and the controller (2, 4, 6, 9, 11, 14) and/or the sensor device (16, 17, 18, 19) to interact such that at least one function can be performed which assists a driver in driving the vehicle (1) . The invention also relates to a vehicle (1) and to a method for assisting a driver in driving a vehicle (1) . [A973]

"Collision prediction device"

In a collision surface determination computing section 27, a collision prediction ECU 2 selects a surface of an own vehicle where an opponent vehicle collides when the own vehicle and opponent vehicle collide with each other. A vehicle track intersection computing section 29 calculates an intersection between the own vehicle and the opponent vehicle. According to the intersection between the own vehicle and opponent vehicle and respective times when the own vehicle and opponent vehicle reach the intersection, a collision determining section 30 determines whether the own vehicle and opponent vehicle collide with each other or not. When it is determined that the own vehicle and opponent vehicle collide with each other, a collision position computing section 32 calculates a collision position of the own vehicle where the opponent vehicle collides according to the collision surface selected in the collision surface determination computing section 27. [A974]

"Method and system for removal of noise in signal"

A method and system for reception of electromagnetic waves in which interference with radio frequencies of other electronics devices occurs comprising, at least one transmitter for transmitting electromagnetic radiation at a wide range of frequencies, at least one receiver fix receiving the received signal comprising the first electromagnetic radiation and RF interfering signal data, a first memory portion for storing transmitted signal waveforms, a second memory portion for storing RF interfering signal data, a switch for periodically allowing the RF interfering signal data to enter the second memory portion from the receiver, the at least one processor operating to process and compare the received signal containing RE signal data and first electromagnetic radiation by matching the received signal against data relating to the transmitted signal waveforms from the first memory portion and RF interfering signal data from the second memory portion, and extract the RF interfering signal data. [A975]

"Risk calculation apparatus"

A moving object risk calculation unit calculates the total value at all points of intersection of a mesh M for the risk due to moving objects at each point of intersection on the basis of the risk due to objects at each point of intersection in the plurality of meshes set in the vicinity of a host vehicle. In this manner, it is possible to acquire the risk due to moving objects, such as another vehicle that is traveling or is stationary or a pedestrian who is walking or is stationary. In addition, a moving object risk calculation unit calculates the total value of the risk due to moving objects at all points of intersection of the mesh by subtracting the total value of the risk due to immovable objects, which is fixed at each point of intersection, at all points of intersection of the mesh from the total value of the risk due to objects. Therefore, since it is not necessary to distinguish between movable objects and immovable objects at each point of intersection of the mesh, the moving object risk calculation unit can calculate the total value of the risk due to moving objects with less computational load. [A976]

"Object detection apparatus for vehicle"

A roadside object present at the side of a subject vehicle travel path and a preceding vehicle at a speed equal to or greater than a predetermined speed are detected based on points derived by transmitting an electromagnetic beam forward of the subject vehicle and projecting reflection points obtained onto a two-dimensional plane, a determination is made when the preceding vehicle passes near the roadside object as to whether it moved toward the travel path within a predetermined time before and after the passage, and the roadside object is not determined to be the obstacle when it is determined to have moved toward the travel path, thereby preventing the roadside object from being misidentified as the obstacle owing to erroneous recognition of it having intruded into the travel path of the subject vehicle when detecting the object using an electromagnetic beam. [A977]

"Apparatus and method for providing obstacle information in autonomous mobile vehicle"

An apparatus for providing obstacle information in an autonomous mobile vehicle and a method thereof, in which a target object is determined to be what obstacle by combining pieces of information received from a laser distance sensor and radars, thereby enabling the autonomous driving of a vehicle. The apparatus and method for providing obstacle information in an autonomous mobile vehicle, which is capable of providing robust obstacle information not only in environments normal times, but also dust environments by combining a laser distance sensor and radars. A problem that an obstacle through which a mobile unit can pass, such as dust, is mistaken for an obstacle through which the mobile unit cannot pass can be solved. [A978]

"Systems and methods for improving bearing availability and accuracy for a tracking filter"

Systems and methods for improving bearing availability and accuracy in a traffic collision-avoidance system (TCAS) . In an exemplary method, if only a single phase-difference value is received for one of two two-element antennas, a processor determines an expected maximum antenna element phase-difference value for the elements of the two-element antenna that did not receive a phase-difference value for a target signal source, estimates a phase-difference value for the two-element antenna that did not include a phase-difference value, based on the expected maximum antenna element phase-difference value and a previously determined predicted bearing value, and calculates bearing based on the estimated phase-difference value and a phase-difference value received from the other two-element antenna. The determination is based on previously received signals associated with the target signal source and based on elevation information of the target signal source and a predefined maximum antenna element phase-difference value for the respective antenna element pair. An output device outputs information associated with the calculated bearing. [A979]

"Method for fill level measurement according to the travel time principle"

A method for measuring a fill level of a fill substance in a container, in which, in an empty container, at least a part of the microwave signals transmitted into the container is reflected back via a reflection on a floor of the container. Microwave signals are transmitted into the container and their fractions reflected back to the fill-level measuring device. These are received as received signals. Echo functions are derived, which show amplitudes of the received signals as a function of a position corresponding to their travel time traveled in the container. A container floor echo is detected at a position, which lies in an earlier determined, both sides limited, empty echo position range, in which the container floor echo occurs in the case of empty container, at an empty echo position dependent on a shape of the container and an installed position of the fill-level measuring device. [A980]

"GeoNexus proximity detector network"

A GeoNexus proximity network provides quick determination of proximity of a large group of associated mobile devices (e.g., `friends`, all devices associated with those who `like` a given posting, etc.) To respond to a given proximity request, a list of identities is obtained for the group of associated mobile devices for which proximity is to be determined. A bucket index is determined of a place to which proximity is to be determined for each of the plurality of associated mobile devices. A target geonexus node associated with the determined bucket index is queried, which in turn queries geonexus nodes adjacent thereto, to quickly determine which of the group of mobile devices are proximate, without the need to individually query for location of each mobile device in the group. [A981]

"Image processing system using unified images"

An image processing system has a plurality of cameras and a display that are mounted on a machine. The plurality of cameras are configured to generate image data for an environment of the machine. The image processing system also has a processor connected to the plurality of cameras and the display. The processor is configured to access the image data from the plurality of cameras, access parameters associated with the plurality of cameras, generate a unified image by combining the image data from the plurality of cameras based at least in part on the parameters, access state data associated with the machine, select a portion of the unified image based at least in part on the state data, and render the portion of the unified image on the display. [A982]

"Cooperative perimeter patrol system and method"

A method of patrolling a perimeter of a geographic area, using two or more unmanned vehicles having means for locomotion along a perimeter path. Each vehicle is equipped with at least the following systems: a navigation system operable to autonomously navigate the unmanned vehicle, an anomaly detection system, a communications system, an anomaly tracking system, operable to track, visually or by following, a detected anomaly, and an alert evaluation system. Each vehicle travels the path on a predetermined route, and is operable to broadcast an alert message to all other vehicles if that vehicle detects an anomaly, to perform an evaluation of any received alert message to determine if it will travel to an anomaly based on stored evaluation rules, and to respond to an alert message based on the evaluation. [A983]

"Identifying undesired conditions in the function of a floating roof of a tank"

A method for identifying an undesired condition in the function of a floating roof of a tank, the method comprising determining a filling level of a product in the tank, detecting a reference distance between a reference position on the roof and the surface using a level gauge mounted on the roof, forming a reference distance deviation as a difference between the reference distance and an expected value, and comparing the reference distance deviation with a specified range. If the reference distance deviation is outside the specified range, a data set including the reference distance deviation and the filling level is stored. These steps are repeated for a plurality of points in time, and the undesired condition is then identified based on stored data sets of reference distance deviations and filling levels. The present invention thus provides an economical method to provide diagnostics of a floating tank roof. [A984]

"Drive support device and drive support method"

A drive support device that supports driving operation of a vehicle, includes: a vehicle speed sensor that detects a current vehicle speed of the vehicle, a target vehicle speed control unit that calculates a reference target vehicle speed range of the vehicle, that sets an indication upper limit speed on the basis of the current vehicle speed detected by the vehicle speed sensor, and determines a target vehicle speed range that is a speed range lower than or equal to the indication upper limit speed on the basis of the reference target vehicle speed range, and a target vehicle speed indicating unit that indicates the target vehicle speed range determined by the target vehicle speed control unit. [A985]

"Device and method for the detection of persons"

The invention relates to systems for the detection and identification (and/or differentiation) of objects for use in vehicles (stationary usage is also conceivable, e.g. to combat crime, building protection) , wherein objects are detected and identified via ultrasound signals. In particular, the differentiation of pedestrians and cyclists from cars and fixed obstacles such as walls is of key focus. Ultrasound sensors are hereby used. By processing the signals and comparing them with reference signals, a differentiation between living and non-living objects is possible. [A986]

"Peripheral salient feature enhancement on full-windshield head-up display"

A method to selectively project graphical images upon a transparent windscreen head up display of a vehicle based upon visual information present in a peripheral zone of vision includes monitoring a location of visual information corresponding to critical information with respect to the windscreen, and processing the location of the visual information to generate display requirements describing the visual information as present in the peripheral zone of vision. Processing the location includes monitoring an estimated operator gaze location with respect to the windscreen, comparing the estimated operator gaze location to the location of visual information, and generating the display requirements when the estimated operator gaze location is distant from the location of visual information by more than a threshold distance. The method further includes generating the graphical images to be projected based upon the display requirements, and projecting the graphical images upon the transparent windscreen head up display based upon the estimated operator gaze location. [A987]

"Underground cavity detection by electromagnetic shock waves"

A method for detection of underground anomalies including in a system of distributed antennas (10) , which are leaky transmission lines, disposed in 16 boreholes (12) formed in a ground, a transmitter (14) being connected to one of the antennas (10) , and a receiver (16) being connected to another of the antennas (10) , injecting an electromagnetic pulse into one of the antennas (10) , wherein the pulse gradually leaks out, and wherein if a speed of propagation in the line in which the pulse is injected is faster than a speed of propagation in the ground, a shock wave is transmitted through the ground, called a transmitted signal, and received as a received signal at another of the antennas (10) , and wherein an underground anomaly diffracts the shock wave, resulting in a detectable disturbance in the received signal, and locating the anomaly as a function of a time delay of the disturbance relative to the transmitted signal. [A988]

"Detecting an underground object"

In a method of detecting an underground object which is at least partially under a surface of ground, a first view of the object determined by transmitting a first radar signal from a first known geolocation. A second view of the object is determined by transmitting a second radar signal from a second known geolocation. The respective first and second trajectories of the first and second radar signals are oblique with respect to the surface of the ground and the respective first and second trajectories are at a first angle with respect to each other. A position of the object is estimated by maximizing a correlation between the first view and the second view by adjusting an estimated dielectric constant associated with medium between the object and the surface of the ground. [A989]

"Radome for a radar sensor in a motor vehicle, and corresponding radar sensor"

A radome for a radar sensor in a motor vehicle. The radome includes a first region, which is permeable to at least one specific type of electromagnetic waves, in particular radar waves, and a second region, which includes a shield, so that the second region is impermeable to the specific type of electromagnetic waves. Also, a radar sensor is described. [A990]

"Device having touch panel, radar apparatus, plotter apparatus, ship network system, information display method and information display program"

A touch panel device includes a display unit and a controller. The display unit displays, on a map or a nautical chart, a position acquired from a GNSS sensor and a symbol set on the map or the nautical chart. The controller controls, when an operation of specifying the symbol is detected, an auxiliary tool to appear on a display screen of the display unit, the auxiliary tool for recognizing a touch operation of moving the symbol. [A991]

"Sensor fusion framework using multiple sensors to assess buried structures"

A method of surveying the condition of an underground conduit by positioning a propelled carriage assembly within the underground conduit. The carriage assembly includes (i) at least one transmitter/receiver unit capable of transmitting a pulsed signal toward at least a portion of an inner wall of the conduit, and (ii) a secondary sensor positioned on the carriage assembly. The data derived from the pulsed signal at a given lateral location within an underground conduit is read as is a secondary sensor condition derived from secondary sensor data taken at the given lateral location. Then it is determined whether the secondary sensor condition indicates a basis for a false void detection by the data derived from the pulsed signal and if the basis for false void detection exists, providing an indication of such basis. [A992]

"Detection and tracking radar, anti high speed mobile defense system having the same and high speed mobile tracking method of detection and tracking radar"

A detection and tracking radar includes a hazardous zone set within a preset radius based on a main body having a radar, a plurality of detection and tracking sectors configured to detect a high speed mobile approaching the main body within detection areas, the detection areas being defined by diving the hazardous zone based on an azimuth angle, and a controller configured to recognize the high speed mobile as a target based upon signals received from the detection and tracking sectors and track the target. Accordingly, rapid detection and tracking of the high speed mobile can be allowed. Also, since the detection and tracking sectors can be independently run, expansion of a radar system can be free by virtue of addition of the detection and tracking sectors. [A993]

"Asset monitoring system using multiple imagers"

Asset including an arrangement for monitoring objects in an interior of the asset includes at least first and second optical imagers for obtaining images of a common area of the interior and which are spaced apart from one another, and processing circuitry coupled to the first and second imagers and arranged to derive information about objects in the interior from images obtained by the first and second imagers. A communication system may be arranged on the asset and coupled to the processing circuitry. The communication system wirelessly transmits the information about the objects to a remote facility. A location determining system may be arranged on the asset to monitor the location of the asset so that the communication system also transmits the location of the asset to the remote facility. [A994]

"Three dimensional scanning beam system and method"

A three dimensional scanning beam system (100) and method (500) enable economical and efficient three dimensional scans of an environment. The system (100) includes a ranging apparatus (105) , and a reactive linkage mechanism (110) having a first end (115) and a second end (120) . The first end (115) is connected to the ranging apparatus (105) and the second end (120) is connected to an object (125) that moves the system (100) through an environment. In use acceleration of the object (125) with respect to the environment is converted by the reactive linkage mechanism (110) to motion of the ranging apparatus (105) with respect to the object (125) , which increases the field of view of the ranging apparatus (105) with respect to the environment. [A995]

"Super delta monopulse beamformer"

An improved approach to direction finding using a super delta monopulse beamformer is disclosed. A super delta channel signal that includes direction finding information from two circular delta channels is formed and output by the super delta monopulse beamformer. This super delta channel signal uses only two channels, but is able to realize the accuracy of conventional three channel systems. [A996]

"Small form-factor distance sensor"

The disclosure relates to measuring a distance from a mobile device to a remote surface. An energy emitter directs an energy signal onto an energy splitter, the energy splitter partitions the energy signal into a first energy beam having a first wavelength and a second energy beam having a second wavelength, a reflector array reflects the first energy beam at a first angle and the second energy beam at a second angle different from the first angle and projects the first energy beam and the second energy beam onto the remote surface, a receiver measures a first propagation time of the first energy beam reflected off of the remote surface and a second propagation time of the second energy beam reflected off of the remote surface, and a processor estimates the distance to the remote surface based on the first propagation time and the second propagation time. [A997]

"Method for operating an autonomous industrial truck"

The invention relates to a method for operating an autonomous industrial truck (1) , having the following method steps: determining, by means of a measuring apparatus (6) of the autonomous industrial truck (1) , whether the industrial truck potentially hits at least one obstacle (7) on the basis of the present movement of said industrial truck (1) , determining that point (14) of the industrial truck (1) , and determining a maximum velocity for the present movement of the industrial truck (1) on the basis of the determined distance (d) , with the result that the industrial truck reliably comes to a standstill in front of the obstacle (7) on the basis of possible braking of the industrial truck (1) . [A998]

"Collision avoidance system and method for vehicles"

A collision avoidance system is configured to be installed in a vehicle, and includes a speed sensing unit to sense a speed of the vehicle, a distance sensing unit to sense a distance between the vehicle and a nearby object, an EPB unit to decelerate the vehicle, and a control unit to compute a length of collision time after which the vehicle is predicted to collide with the object according to the speed of the vehicle and the distance between the vehicle and the object, and to control the EPB unit to decelerate the vehicle when the collision time is not longer than a brake time length. [A999]

"Mapping active and inactive construction zones for autonomous driving"

Aspects of the present disclosure relate to differentiating between active and inactive construction zones. In one example, this may include identifying a construction object associated with a construction zone. The identified construction object may be used to map the area of the construction zone. Detailed map information may then be used to classify the activity of the construction zone. The area of the construction zone and the classification may be added to the detailed map information. Subsequent to adding the construction zone and the classification to the detailed map information, the construction object (or another construction object) may be identified. The location of the construction object may be used to identify the construction zone and classification from the detailed map information. The classification of the classification may be used to operate a vehicle having an autonomous mode. [A1000]

"Forward facing sensing system for vehicle"

A vehicular forward facing sensing system includes a radar sensor device disposed within an interior cabin of a vehicle and having a sensing direction forward of the vehicle. An image sensor is disposed within the interior cabin of the vehicle and has a viewing direction forward of the vehicle. A control includes an image processor, which is operable to analyze images captured by the image sensor in order to, at least in part, detect an object present forward of the vehicle. The control, at least in part, determines that a potentially hazardous condition may exist in the path of forward travel of the vehicle. The radar sensor device and image sensor collaborate in a way that enhances the sensing capability of the sensing system for the potentially hazardous condition in the path of forward travel of the vehicle. The image processor processes captured image data utilizing object detection software. [A1001]

"Ascertaining an indicator for the drive-over capability of an object"

In a method for ascertaining whether a target object can be driven over by the controlled motor vehicle, with the aid of frequency-modulated radar signals of a radar sensor, amplitude ratios between received radar signals reflected from the target object are utilized, the received radar signals corresponding to signals which have been transmitted in different frequency ranges. Based on the amplitude ratios, an occurrence of interference between (i) a first radar signal propagation path between the radar sensor and the target object and (ii) a second propagation path with additional reflection from a road is detected, and based on the detection of an occurrence of interference it is ascertained whether the object can be driven over. [A1002]

"Radar sensor for motor vehicles, especially LCA sensor"

A radar sensor for motor vehicles has a transmitting antenna in the form of a planar array antenna having a plurality of juxtaposed antenna elements, and a supply network for supplying microwave power to the antenna elements, wherein the supply network is developed to supply the antenna elements with the microwave power having a phase shift increasing at constant increments from one end of the row to the other. [A1003]

"Inter-vehicle alert system with nagable video look ahead"

An apparatus includes a video encoder, a camera and radio frequency modulation circuitry. The radio frequency modulation circuitry is operative to modulate a radar signal to include video data. A radar transmitter is operatively coupled to the radio frequency modulation circuitry, and is operative to transmit a radar signal including the video data. The apparatus may also include radio frequency demodulation circuitry and a video decoder. The video decoder is operative to decode video data contained in a radar signal demodulated by the radio frequency demodulation circuitry. An inter-vehicle alert system controls the camera to initiate capturing video data which includes the video data. A method of operation modulates a radar signal to include at least a portion of the video data captured in response to detecting an obstruction, and transmits the radar signal to a second vehicle via an antenna array oriented at the moving vehicle's rear. [A1004]

"Device for round trip time measurements"

An appliance facilitates localization of a station (STA) in a network, for example, a short-range wireless network. An automatic response to a request for a measurement related communication is provided. The appliance can include a radio frequency (RF) interface and a media access control (MAC) section. The MAC section can receive the request and generate the automatic response immediately after a uniform period that is uniform among any such appliance within the network. The appliance performs only the generation of the automatic response, though the response can include additional information such as (x, y) coordinates of the appliance. [A1005]

"Directional adjustment of voltage-controlled phased array structures"

Implementations and techniques for directional adjustment of voltage-controlled phased array structures are generally disclosed. [A1006]

"Driver assistance device for a vehicle, vehicle and method for operating a radar apparatus"

The invention relates to a driver assistance device (2) for a vehicle (1) , having a radar apparatus (3, 4) for detecting objects which are external to the vehicle, which radar apparatus (3, 4) has an antenna unit (14) for irradiating and/or receiving electromagnetic waves (S.sub.0, S.sub.E) and a damping element (24, 25, 26) which is coupled to the antenna unit (14) and has the purpose of directing and damping the electromagnetic waves (S.sub.0, S.sub.E) , by means of which damping element (24, 25, 26) the antenna unit (14) can be coupled to a transmitter and/or receiver device (16, 17) of the radar apparatus (3, 4) , wherein the damping element (24, 25, 26) has a branching unit (31) with a first line branch (32) for directing the damped electromagnetic waves (S.sub.0, S.sub.E) between the transmitter and/or receiver device (16, 17) , on the one hand and the antenna unit (14) on the other, as well as a second line branch (33) which is coupled to the first line branch (32) and is terminated with a reflection-free terminating element (35, 37) . The invention also relates to a corresponding method. [A1007]

"Risk degree calculation device"

A risk degree estimation device of a driving assistance device calculates the potential risk degree at a plurality of intersection points in a mesh set around a host vehicle. The risk degree estimation device changes the amount of information relating to the potential risk degree calculated for the entire region of the mesh in which the intersection points are set in accordance with at least one of the environment and state of the host vehicle. for this reason, it becomes possible to calculate the potential risk degree around the host vehicle depending on the situation. [A1008]

"Obstacle determination device"

Disclosed is an obstacle determination device (1) including a driving assistance ECU (3) that determines collision with an obstacle detected by output of a radar (2) mounted on a vehicle and performs driving assistance for the vehicle. When a distance of a null-point zone divided by null points where the output of the radar (2) is low is represented as a distance between the null points, the driving assistance ECU (3) determines, in a distant zone that is away from a reference zone that is the null-point zone nearest to a host vehicle in a predetermined range, if the null-point zone of the distance between the null points shorter than the distance between the null points in the reference zone is detected by a predetermined number or more, that the host vehicle does not collide with the detected obstacle. [A1009]

"Distance estimation system and method for a railway vehicle"

There is provided a ranging system for a railway vehicle. The system includes a reflector disposed along a railway relative to a stopping point and a ranging unit disposed on the railway vehicle. The ranging unit includes a transceiver configured to transmit an outbound signal and receive a corresponding reflected signal from the reflector. The ranging unit also includes a data storage unit configured to store a reference distance between the reflector and the stopping point. The ranging unit also includes a processor configured to determine a measured distance between the railway vehicle and the reflector based on an elapsed time between the transmitting the outbound signal and receiving the reflected signal. The processor determines a distance between the railway vehicle and the stopping point based on the measured distance and the reference distance. [A1010]

"Method and device for detecting a target by masked high energy reflectors"

Methods and devices for detecting, in a scene, a first type reflector is provided. The method includes identifying, using a radar in a mobile system, a zone of a distance-radial velocity space that contains a second type reflector. The second type reflector is capable of concealing the first type reflector. The method includes modeling an order two phase shift over time of theoretical first type and second type reflectors. The method includes creating a filter a distance and a radial velocity. The method includes illuminating the scene. The method includes acquiring raw radar data from the echoes reflected by the reflectors of the scene. The method includes obtaining distance profiles. The method includes applying a filter on the distance profiles. The method includes detecting the first type reflector among the second type reflector. [A1011]

"Vehicle-mounted radar apparatus"

A vehicle-mounted radar apparatus for transmitting radar waves in a forward traveling direction of a vehicle mounting the apparatus thereon (radar-mounting vehicle) and receiving the radar waves reflected from an object to acquire information about the object. In the apparatus, a target detection unit transmits and receives the radar waves to detect positions of targets. A representative target selection unit selects a representative target from the targets detected by the target detection unit. A same-object target selection unit selects targets belonging to the same object as the representative target. An object position determination unit calculates a value of a predefined function of lateral positions of two or more targets of all the targets selected by the same-object target selection unit as a lateral position, along a vehicle-width direction of the radar-mounting vehicle, of the specific reflecting object. [A1012]

"Apparatus and method for traffic lane detection"

Two radar devices are installed for adjacent lanes. A memory sequentially stores a received power value at a time when the two radar devices receive the reflected wave from a vehicle at specified time intervals. A calculator calculates, when a vehicle moves in a direction approaching the two radar devices, as a representative value of the received power at a specified time, a weighted average value when weights, which become heavier as an acquisition time of the received power value becomes farther from the specified time, are assigned to a specified number of received power values, whose acquisition time is prior to a specified time, where a priority is given to the received power values whose acquisition time is close to the specified time. A discriminator determines a lane in which the vehicle is traveling according to a result of comparing the sizes of the calculated representative value. [A1013]

"Method for adjusting or calibrating a vehicle surrounding sensor, and a vehicle surrounding sensor adjustment or calibration system"

A method for calibrating a vehicle surroundings sensor (15) includes the steps of attaching at least one target pair (20, 22) to the rear wheels (12, 14) of a motor vehicle (7) , recording the target pair (20, 22) using at least one measuring unit (32, 46) and determining the vehicle axis (64) from the recording, placing a target (16, 18) in a known position relative to a vehicle surroundings sensor adjustment or calibration element (62) , fastening at least one measuring unit (32, 46) by means of fastening adapters (34, 48) to a running rail (4, 6) , recording the target (18) placed on the vehicle surroundings sensor adjustment and determining the angular position of the vehicle surroundings sensor adjustment or calibration element (62) relative to the vehicle axis (64) , aligning the vehicle surroundings sensor adjustment or calibration element (62) relative to the vehicle axis (64) , and adjusting the vehicle surroundings sensor (15) relative to the vehicle axis (64) . [A1014]

"Perception based loading"

Systems and methods for assisted positioning of a haul machine at a destination position for receiving materials from a loading machine are provided. The method includes obtaining from at least one perception device information reflecting a location or orientation of a first fiducial attached to the loading machine, determining a location or position of the first fiducial based on the information provided by the at least one perception device, determining the destination position based on the location or position of the first fiducial, and issuing guidance to an operator of the haul machine indicating an adjustment in steering angle based on the determined destination position. [A1015]

"Vehicle control system, specific object determination device, specific object determination method,

and non-transitory storage medium storing specific object determination program"

A vehicle control system includes: an anti-collision safety control unit executing anti-collision safety control for avoiding or alleviating a collision with an object including a reflection point on the basis of positional information about the reflection point, output from a positional information output unit, and a cancellation unit calculating an index value that increases with a duration of a state where a variation in a position of the reflection point in a direction perpendicular to a vehicle travelling direction is smaller than a predetermined amount and that, when the index value exceeds a threshold, issues a command such that the anti-collision safety control unit does not execute anti-collision safety control over the reflection point. When it is determined that the vehicle is travelling near a curve entrance, the cancellation unit increases the threshold as compared with when it is determined that the vehicle is not travelling near a curve entrance. [A1016]

"Method and system for obstacle detection for vehicles using planar sensor data"

A computer-implemented method and system for automatically detecting an obstacle from a moving vehicle using a planar sensor mounted on the vehicle. [A1017]

"Method and system for detecting an object or body based on changes in signal phases"

Embodiments of the invention are directed to control devices configured for use with computing devices. More specifically, the present invention relates to methods and devices for performing presence detection of an object body near a device. The methods and devices described herein may include comparing a reference signal against an over the air signal to determine whether a phase difference exists between the reference signal and the over the air signal. The existence of a phase difference may be indicative of a object or body in proximity to the device. [A1018]

"Technique for lane assignment in a vehicle"

A technique for assigning lanes on a road to objects moving in a vicinity of a vehicle on the road is proposed. A method embodiment of the invention comprises the steps of providing trajectories, wherein the or each trajectory represents a time sequence of positions of a moving object, selecting first and second objects and determining a distance between a current position of the first object and the trajectory of the second object, comparing the distance with a predefined threshold, and providing, based on a result of the comparison, a lane assignment indicating a lane to which the second object is assigned. [A1019]

"Shield"

A printed circuit board shield (100) is provided. The shield comprises a sealing surface (120) and a shielding surface (110) . The sealing surface is configured to cooperate with, and be connectable to, a sealing region of a printed circuit board (80) upon assembly therewith. The shielding surface is substantially parallel to but offset from, the sealing surface. A concave cover for receiving at least part of the printed circuit board is thereby defined. The shielding surface comprises an array of perforations (130) formed therethrough. The array of perforations is configured to correspond to a location of an electronic component mounted on the printed circuit board. [A1020]

"Method for tracking and forecasting marine ice bodies"

A near-real-time tracking and integrated forecasting of marine ice bodies observable on satellite imagery. [A1021]

"Method for operating at least one sensor of a vehicle and vehicle having at least one sensor"

A method is provided for operating a sensor of a vehicle. The sensor is configured to detect objects within a detection range and the method includes, but is not limited to detecting an object with the sensor. In addition, a position of the object is determined with data from the sensor. Furthermore, position data emitted by the object is received with a receiving apparatus of the vehicle and the position of the object is determined with the position data. Moreover, the position determined with the sensor is compared with the position of the object and comparative data is determined and an automatic adjustment of the sensor and/or output of a message inside the vehicle is made depending on the comparative data. [A1022]

"Method for detecting a wheel of a vehicle"

A rotating wheel of a vehicle is detected by evaluating the Doppler shift of a measuring beam, which is emitted by a detector unit passed by the vehicle, and is reflected by the wheel and returned in Doppler-shifted form. In a relative position to the wheel, the vehicle comprises an onboard unit, which can establish radio communication with a transceiver having a known location in the detector unit. The direction and distance of the onboard unit from the transceiver are measured on the basis of at least one radio communication between the same. The radiation direction or radiation position of the measuring beam is controlled in accordance with the measured direction and distance and taking into consideration the aforementioned relative position and location. [A1023]

"Virtual input system"

For a user having a user input actuator, a virtual interface device, such as for a gaming machine, for determining actuation of a virtual input by the input actuator is disclosed. The device comprises a position sensing device for determining a location of the user input actuator and a controller coupled to the position sensing device, the controller determining whether a portion of the user input actuator is within a virtual input location in space defining the virtual input. [A1024]

"System for and method of weather phenomenon detection using multiple beams"

The method includes providing a first radar pulse at a first beam position during a radar scan and receiving a first return, the first radar pulse being a velocity sampling beam. The method also includes providing a second radar pulse at a second and different beam position during the radar scan and receiving a second return, the second radar pulse overlaps and is not identical to the first radar pulse. The method further includes providing a third radar pulse using a lower gain wider beam width beam pattern at the first beam position during the radar scan and receiving a third radar return, the third radar pulse being a side lobe detection beam. The method can also include processing the first return, the second return and the third return and using data associated with the first return, the second return and the third return to determine a presence of weather phenomenon and to identify and remove returns from non-weather targets. [A1025]

"Mode S anti-reflection algorithm for eliminating false tracks due to reflected replies in ground radar systems"

A Mode S anti-reflection method for eliminating false tracks due to reflected replies in ground radar systems, wherein the information contribution of the replies (at the level of raw video) is analyzed with the aim of calculating the position of the reflectors. The possible presence of ADS-B reports can be used, otherwise it will be effectuated a geometrical analysis of the distribution of the replies and will be compared with the plot (s) extracted by the radar sensor. The possibility of correlating along time the moving of the plots, their place of origin and average duration of the tracks generated by them will allow to understand whether the plot is relevant to a reflection or not. In the case of "reflection", a reflectors map is updated automatically in order to avoid the enabling of the initialization of the track in that area. [A1026]

"Radar device for behind windshield installations"

A ground vehicle radar system includes a windshield of the ground vehicle and a radar device installed behind the windshield. The windshield includes a metallization layer configured to inhibit propagation of infrared radiation through the windshield that also inhibits the propagation of radar signals. The metallization layer defines an opening in the metallization layer for radar signals emitted and detected by a radar device to pass through. An antenna of the radar device is installed behind the windshield and aligned with the opening. A lower portion of the antenna has a first field of view through the opening characterized as being directed horizontal toward a horizon forward of the vehicle. An upper portion of the antenna has a second field of view through the opening characterized as being directed downward toward an area of the ground forward of the vehicle. [A1027]

"Apparatus and method for driving guide of vehicle"

An apparatus and method for a driving guide of a vehicle are provided and include a sensor unit that has at least one sensor mounted within the vehicle. In addition, a controller is configured to sense obstacles positioned at a front and side of the vehicle using sensing information received from the sensor unit and arrange data for the obstacles based on an angle to determine whether a passage is present in front of the vehicle. In addition, the controller is configured to provide the driving guide of the checked passage. [A1028]

"Terrain aided navigation using multi-channel monopulse radar imaging"

A terrain aided navigation using multi-channel monopulse radar imaging to provide a navigation position update. The monopulse radar transmits a single RF pulse transmission or multiple quick RF pulse train bursts to generate a monopulse radar image that can be correlated with a digital terrain segment to provide navigation updates when requested. The radar has monopulse and off-axis capability that allows for selection of a terrain segment within the radar's search area that will provide a good terrain correlation. The radar measurements are made on a range/Doppler cell-by-cell basis that includes angle information. The cells in the range/Doppler map corresponding to the antenna main beam return are converted into a high resolution (x,y,z) image and correlated to the selected terrain segment in the data base reference frame to provide an updated navigation position estimate. [A1029]

"Antenna cover"

An antenna cover (1) for a radar (2) for a vehicle has a rectangular parallelepiped shape, having a flat cover top (10) that faces a microstrip antenna (21a, 21b) of the radar (2) and a sidewall (11) that covers the microstrip antenna (21a, 21b) sideways. The sidewall (11) is located out of the range where the electromagnetic waves to be received by the microstrip antenna (21a, 21b) are directly received. An inner face (11a) of the sidewall (11) is at a right angle to the cover top (10) . An outer face (11b) of the sidewall (11) is at a constant angle .theta. larger than 0 degree but smaller than 90 degrees, to the inner face (11a) of the sidewall (11) . The sidewall (11) is structured such that its thickness increases toward the side where the microstrip antenna (21a, 21b) is present. [A1030]

"Curved-section-information supplying apparatus and curved-section-information supplying method"

A curved-section-information supplying apparatus includes: a clothoid-section identifying unit that identifies a clothoid section included in a curved section of a road, a clothoid-coefficient obtaining unit that obtains a clothoid coefficient for a clothoid curve representing a shape of the clothoid section identified by the clothoid-section identifying unit, and a radius-of-curvature calculating unit that calculates a radius of curvature at a position at a travel distance in the clothoid section, based on the clothoid coefficient and a curve length from a start point of the clothoid curve, the curve length corresponding to the travel distance from a start point of the clothoid section, to supply curved-section information based on the radius of curvature at the position at the travel distance in the clothoid section. [A1031]

"Broadband electromagnetic wave-absorber and process for producing same"

Disclosed is an electromagnetic wave absorbent which exhibits high electromagnetic wave absorption performance over a wide band. The electromagnetic wave absorbent contains a conductive fiber sheet which is obtained by coating a fiber sheet base with a conductive polymer and has a surface resistivity within a specific range. The conductive fiber sheet is formed by impregnating a fiber sheet base such as a nonwoven fabric with an aqueous oxidant solution that contains a dopant, and then bringing the resulting fiber sheet base into contact with a gaseous monomer for a conductive polymer, so that the monomer is oxidatively polymerized thereon. [A1032]

"Monitoring apparatus and method"

Embodiments of the invention provide an apparatus for monitoring one or more target objects in an environment external to a host vehicle by means of at least one sensor. The apparatus is arranged to trigger at least one action responsive to detection by means of the at least one sensor of prescribed relative movement between the host vehicle and the one or more target objects. The apparatus is arranged to determine a lateral offset value being a distance of the or each target object from an extended axis of the host vehicle and to over-ride triggering of the at least one action such that triggering of the at least one action is not performed in dependence on the lateral offset value. [A1033]

"Systems and methods for calibrating dual polarization radar systems"

A dual polarization radar system is calibrated based on real-time data measurements, such as measured horizontal and vertical reflectivities, Z.sub.H and Z.sub.V. In this regard, the radar system analyzes the reflected power measurements to identify which measurements are associated with reflections from a respective spherical object. Using such measurements, the system determines a system differential reflectivity value, and combines such value with reflected power measurements for calibration. Since the calibration is based on real-time data measurements, the calibration process may run simultaneously with the collection of weather data. Further, the calibration process is immune to the weather events within range of the radar system. Accordingly, it is possible for the calibration to be performed at any time and without interfering with the weather monitoring activities regardless of the types of weather events occurring within the vicinity of the radar system. [A1034]

"Obstacle detection apparatus and obstacle detection program"

An obstacle detection apparatus includes a transmission antenna transmitting radio waves, a reception antenna receiving radio waves transmitted to and reflected by an obstacle, an obstacle detection unit configured to detect the obstacle based on the received radio waves, a false detection determination unit configured to determine presence or absence of a false detection characteristic, which is set in advance, with regard to the detected obstacle, a camera capturing an image, and an obstacle existence determination unit configured to determine, based on the image captured by the camera, presence or absence of the obstacle on which it is determined that the false detection characteristic is present. [A1035]

"Solid object detection system using laser and radar sensor fusion"

A light detection and ranging device associated with an autonomous vehicle scans through a scanning zone while emitting light pulses and receives reflected signals corresponding to the light pulses. The reflected signals indicate a three-dimensional point map of the distribution of reflective points in the scanning zone. A radio detection and ranging device scans a region of the scanning zone corresponding to a reflective feature indicated by the three-dimensional point map. Solid objects are distinguished from non-solid reflective features on the basis of a reflected radio signal that corresponds to the reflective feature. Positions of features indicated by the reflected radio signals are projected to estimated positions during the scan with the light detection and ranging device according to relative motion of the radio-reflective features indicated by a frequency shift in the reflected radio signals. [A1036]

"Subterranean mapping system including electrically conductive element and related methods"

A subterranean mapping system may include at least one electrically conductive element associated with a subterranean formation having a passageway therein. The subterranean mapping system may also include a radiofrequency (RF) source coupled to the at least one electrically conductive element to generate an electromagnetic (EM) field in the subterranean formation. The subterranean mapping system may also include a subterranean mapping device configured to be carried along a path of travel within the passageway and while sensing the EM field versus time. [A1037]

"Weather detection using satellite communication signals"

Disclosed is a satellite weather detection system that uses atmospheric precipitation density data. Subscribers detect the signal strength and signal-to-noise ratio of signals that are transmitted from the satellite. Upstream transmit power data is also collected, which is needed to achieve a given SNR at a gateway. The values of the downstream signal strength and signal-to-noise ratio data as well as the upstream transmit power data are normalized and compared with current atmospheric data. The data can be color coded and graphically displayed to show weather patterns. Location and velocity of high precipitation density cells can be tracked to predict movement of storms. [A1038]

"Smart beam selection for radar aided navigation"

A method of determining the ground speed or drift angle of an aircraft is described. It is determined whether or not a weather threshold has been met based on returns of a radar beam which is pulse compressed in a first scan. If the weather threshold is determined to have not been met, a ground speed or drift angle of the aircraft is determined based on Doppler processing of radar beam returns of a radar beam in a second scan. If the weather threshold has been met, a bottom radar beam is directed lower to the ground, and a ground speed or drift angle of the aircraft is determined based on Doppler processing returns of the bottom radar beam directed lower to the ground. A corresponding radar system is also described. [A1039]

"Level measuring system operating according to the radar principle"

A level measuring system which operates according to the radar principle for measuring the level of a medium which is located in a vessel has a signal transmission apparatus for emission of an electromagnetic signal, an electronic apparatus which generates an electromagnetic signal, and a pressure-tight and/or diffusion-tight separating element. The electronic apparatus is made in several parts, one of which is a signal generating component. The signal generating component and another component of the electronic apparatus are made as independent units which are spatially separated from one another. There is a communication apparatus between the signal generating component and the other component, and there is a pressure-tight and/or diffusion-tight separating element between the other component and the signal transmission apparatus. [A1040]

"Wave dielectric transmission device, manufacturing method thereof, and in-millimeter wave dielectric transmission"

A millimeter wave transmission device, the millimeter wave transmission device with (a) a first signal processing board for processing a millimeter wave signal, (b) a second signal processing board signal-coupled to the first signal processing board to receive the millimeter wave signal and perform signal processing with respect to the millimeter wave signal, and (c) a member provided between the first signal processing board and the second signal processing board and having a predetermined relative dielectric constant and a predetermined dielectric dissipation factor. The member constitutes a dielectric transmission path via which the millimeter wave signal is transmitted between the first signal processing board and the signal processing board. [A1041]

"Imaging, object detection, and change detection with a polarized multistatic GPR array"

A polarized detection system performs imaging, object detection, and change detection factoring in the orientation of an object relative to the orientation of transceivers. The polarized detection system may operate on one of several modes of operation based on whether the imaging, object detection, or change detection is performed separately for each transceiver orientation. In combined change mode, the polarized detection system performs imaging, object detection, and change detection separately for each transceiver orientation, and then combines changes across polarizations. In combined object mode, the polarized detection system performs imaging and object detection separately for each transceiver orientation, and then combines objects across polarizations and performs change detection on the result. In combined image mode, the polarized detection system performs imaging separately for each transceiver orientation, and then combines images across polarizations and performs object detection followed by change detection on the result. [A1042]

"Radar sensor for motor vehicles"

A radar sensor for motor vehicles includes: a transmit and receive component, which includes a mixer for mixing a transmitted signal with a received signal, an evaluation circuit which is connected to an output of the mixer by a direct voltage coupling device, and a compensation device for compensating a DC offset in the output signal of the mixer, the compensation device being subdivided into a rough compensation device in the transmit and receive component, and a fine compensation device in the evaluation circuit. [A1043]

"Multi-transceiver RF alert system for preventing hunting accidents"

The RF system for preventing hunting accidents comprising RF interrogator mounted on the firearm or hunter's hat and RF transponder attached to hunter's hat, wherein directional pattern of antennas of the hat-mounted interrogator is directed along the line of view of the hunter so matching with sightline of hunter's rifle, and RF transponder, which, to cover directional pattern of 360 arc degrees in azimuth, contains a number of RF transceiver evenly attached to the hunter's hat in horizontal plane and connected to the single electronic unit. The system provides alert information about "friendly targets" that could be under fire, such as other hunters or persons equipped with said transponder, and if they are, the system develops alert signal: "Do not shoot". [A1044]

"Microwave-sending device"

A microwave-sending device for emitting microwaves includes electronics, a wave coupler, a waveguide, and a wave-emitting section. The electronics, the wave coupler, and the waveguide are joined by a common casting. [A1045]

"Method of determining the position of a vehicle moving along a guideway"

A method of determining the position of a vehicle moving along a guideway is disclosed wherein signals from groups of transponders located beside the guideway are detected as the vehicle moves along the guideway to create a footprint in the time domain corresponding to the time the vehicle is in communication with that transponder. The transponders of each group are spaced a known distance apart from each other. An estimate of the position of the moving vehicle is computed by matching the point in the time domain that bears the same geometric relationship to the footprints corresponding to the transponders of the group to a point in the spatial domain that bears a known geometric relationship with the transponders of each group. [A1046]

"Analytic and tracking systems and methods using over-the-air identifiers of mobile devices"

Analytic and tracking systems and methods are described that use over-the-air identifiers (OTAIs) of mobile devices for tracking, dispatch, identification, etc. In particular, the analytic and tracking systems and methods can include various OTAI sensors that are communicatively coupled to a server and with one another. The OTAI sensors are configured to identify proximate mobile devices concurrent with at least one additional piece of information. The analytic and tracking systems and methods can process identified mobile devices and the additional pieces of information for a plurality of applications. [A1047]

"Techniques for obtaining information about objects"

Techniques for obtaining information about an object on which a radio-frequency transceiver device is mounted when in a space defined by a vehicular frame. A request is generated at a telecommunications device for the object's location and received at an interrogator on the frame. In response to receipt of the request, the interrogator directs antennas to transmit RF signals into the space. The transceiver device returns a signal if and when it receives any signal or a signal having a particular identification from the antenna (s) . Return signals from the transceiver device are received at each antenna and a processor, on the vehicle or the telecommunications device, derives information about the object based on the return signals. The derived information includes a location of the object in the space and/or an identification of the object, and may be displayed on a display of the telecommunications device. [A1048]

"Subterranean mapping system including spaced apart electrically conductive well pipes and related methods"

A subterranean mapping system may include a pair of spaced electrically conductive well pipes in a subterranean formation containing a hydrocarbon resource. The pair of electrically conductive well pipes may include a fluid inlet pipe and a fluid outlet pipe. The subterranean mapping system may further include a radiofrequency (RF) source coupled to the pair of electrically conductive well pipes to generate an electromagnetic (EM) field in the subterranean formation. The subterranean mapping system may further include a subterranean mapping device configured to be carried along with a fluid flow along a path of travel from the fluid inlet pipe to the fluid outlet pipe and while sensing the EM field versus time. [A1049]

"System and method for estimating range to an RFID tag"

The a system for measuring distance between an RFID reader and tag, including an adaptive linear combiner, which is a tapped delay line with controllable weights on each tap, and outputs that are summed and subtracted from a reference to produce an error signal. After a sufficient number of cycles, the weight distribution indicates the delay of the received signal with respect to the reference, and by extension determines the distance between the tag and receiver. [A1050]

"Method for ascertaining and/or evaluating fill-state of a container containing at least one medium"

A method for ascertaining and/or evaluating the fill-state of a container filled with at least one medium, wherein high-frequency, electromagnetic, measuring signals are emitted by a fill-level measuring device and received back as wanted echos reflected at an interface of the media. The electromagnetic, measuring signals are received back as an end echo reflected at a measuring range end, wherein, from the received wanted echos and the end echo, an echo curve is formed as a function of travel-time and/or the travel-distance, wherein, by means of a search algorithm integrated in the fill-level measuring device, number, existence and/or position of individual wanted echos and of the end echo in the echo curve are/is ascertained and applied for classifying the currently present fill-state in the container relative to predetermined, stored, fill situations in the container. On the basis of the classified fill situation in the container, with a distance value of the fill-level and/or a distance value of the separating-layer are/is associated belonging travel-times and/or belonging travel-distances of the individual wanted echos and/or end echo in the echo curve. [A1051]

"Vehicle detection device and vehicle detection method"

A vehicle detection device includes: an antenna configured to sense electromagnetic waves, an image generation unit configured to generate a radio wave image, a road surface region detection unit configured to detect a road surface region in the radio wave image, a symmetry axis setting unit configured to set a first symmetry axis at a part of the boundary of the road surface region, a road surface reflection region setting unit configured to set a horizontal central line at a center of the radio wave image and set a road surface reflection region between the central line and the first symmetry axis, and a vehicle detection unit configured to compare the waveform of pixel outputs in the road surface reflection region with the waveform of pixel outputs in the road surface region and to detect the road surface reflection region as a vehicle. [A1052]

"System for tracking ships at sea"

The system comprises terminals that are mounted onto a predetermined number of feeder vessels, comprises means for detecting identification signals sent by surrounding ships, and moreover comprises means for recording identification information that include the detected identification signals and the current position of the feeder vessel. Said system also comprises a system for transmitting data via satellites, said data transmitting system making it possible to transmit data between the terminals and a monitoring center, said monitoring center including a means for generating requests intended for the terminals in order to ask said terminals to provide the recorded identification information. Said monitoring center also includes a means for analyzing the received identification information. [A1053]

"Device location determination by a vehicle"

A device location determination includes authenticating a device within range of a vehicle via a node in a vehicle. The vehicle includes a first peripheral device and a second peripheral device that is disposed at a location on the vehicle that is different than the first peripheral device. The peripheral devices are coupled to an antenna of the node. The device location determination also includes receiving from the device a first signal strength value associated with a first signal of the first peripheral device, a second signal strength value associated with a second signal of the second peripheral device, and a third signal strength value associated with a third signal transmitted by the node. The device location determination also includes determining a location of the device from the signal strength values and performing a remote function with respect to the vehicle. [A1054]

"Fetal monitoring device and methods"

Described herein are fetal and/or maternal monitoring devices, systems and methods using UWB medical radar. These devices and systems may include a UWB sensor providing high-resolution and reliable simultaneous monitoring of multiple indicators of fetal and/or maternal health, such as fetal heart rate, fetal heart rate variability, fetal respiration, fetal gross body movement, maternal contractions, maternal heart rate, maternal respiration, and other derivative parameters during virtually all stages of pregnancy and during delivery. The sensor allows novel collection of physiological data using a single sensor or multiple sensors to develop individual and aggregate normal motion indices for use in determining when departure from normal motion index is indicative of fetal or maternal distress. [A1055]

"Sparse array RF imaging for surveillance applications"

Techniques are provided for sparse array RF imaging for surveillance applications. The present invention enables object image identification using a sparsely populated array of distributed radio nodes deployed and operated as a radar detection, tracking and identification application. Three-dimensional object images are formed, from which estimates of extent and shape can be extracted for objects that are detected in the vicinity of the deployed radar array. In addition, techniques are provided for the identification and/or classification of vehicles, humans and fauna through feature extraction from the formed three-dimensional images. [A1056]

"Vehicle-mounted radar apparatus"

A vehicle-mounted radar apparatus for transmitting radar waves toward the outside of a vehicle mounting the apparatus thereon and receiving the radar waves reflected from an object to thereby acquire information about the object. In the apparatus, a target detection unit transmits and receives the radar waves to detect positions of targets. An object position determination unit determines a position of the object reflecting the radar waves on the basis of the positions of the targets. A representative target selection unit selects a representative target from the targets. A same-object target selection unit selects targets belonging to the same object as the representative target. A large-vehicle determination unit determines whether or not the object is a large vehicle on the basis of a number of targets selected by the same-object target selection unit and reflection wave received powers for the respective targets. [A1057]

"Hand-held radar device with direct printing based on radar input"

The disclosed technology includes a device and method of use for direct printing and ink or other marking, in conjunction with GPR techniques. In a most basic embodiment of the disclosed technology, a relevant date, time, filename, and other parameters are printed or otherwise physically exhibited on the measurement surface, so that RADAR files can be later attributed to a specific data collection site. In a more advanced embodiment of the disclosed technology, actual RADAR target information is printed, or otherwise physically exhibited, on the measurement surface, such as while measuring, or substantially while measuring, the surface and substrate beneath with GPR. [A1058]

"Radar device"

A radar device (10) comprising a transmission antenna (14) for transmitting electromagnetic waves, a reception antenna (15) for receiving waves, and a detector unit (34) which detects, based on the reflected waves, the positions of a preceding vehicle and a preceding object, judges the preceding object to be the same as the preceding vehicle if the position of the preceding object is in a predetermined preceding vehicle judging range with the position of the preceding vehicle as a reference, detects the positions of an oncoming vehicle and an oncoming object and judges the oncoming object to be the same as the oncoming vehicle if the position of the oncoming object is in a predetermined oncoming vehicle judging range with the position of the oncoming vehicle as a reference, wherein the oncoming vehicle judging range is set to be narrower than the preceding vehicle judging range. [A1059]

"Polaritonic meta-material combat identification"

An identification apparatus, capable of distinguishing between a first class of objects and a second class of objects. This identification apparatus includes an identification tag, which is capable of providing a certain reflection band and a certain thermal emission band. The identification apparatus also includes a thermal weapon sight which has a long-wave infrared band-pass filter. This band-pass filter passes through a desired range of wavelengths and filters out an undesired range of wavelengths. The reflection band and the thermal emission band are detectable within the desired range of wavelengths. [A1060]

"Systems and methods for updating HIL and HFOM integrity components when not extrapolating position data"

Systems and methods for reporting position and associated integrity during times when extrapolation is not taking place as accurately as possible. In one example, a processing device deactivates extrapolation of global positioning system (GPS) position information based on a predefined condition, receives ground speed information, and HFOM and HIL values from a global position system (GPS) , calculates inflated HFOM and HIL values based on the received HFOM and HIL values and the ground speed and generates an automatic dependent surveillance-broadcast (ADS-B) OUT signal based on the calculated inflated HFOM and HIL values. A transmitter coupled to the processing device transmits the generated ADS-B OUT signal. [A1061]

"Device and method for determining media and container properties"

A fill-level measuring device includes a self-learn device that can calculate the length of the dome shaft, the container height, the permeability value of a feed material or the permittivity value of a feed material. This takes place with the use of one or several determined speed values of echoes of a measured echo curve. In this manner the accuracy of fill level determination can be improved. [A1062]

"Adaptative cruise control"

An adaptive cruise control system for a motor vehicle includes a forward looking object detecting arrangement for simultaneously detecting several target objects moving in the predicted path and adjacent paths of the equipped vehicle. The detecting arrangement is arranged to continuously monitor velocity and distance to each of the target objects, and a processing arrangement processes signals from the detecting means to provide information of distance to and relative speed of vehicles travelling in front of the equipped vehicle. [A1063]

"Vehicle travel control system"

An ECU that integrally controls a vehicle travel control system includes an initial travel plan producing section which produces an initial travel plan including a decelerating interval in which an engine of a vehicle is stopped to decelerate the vehicle, a travel plan reconfiguring section which reconfigures the initial travel plan produced by the initial travel plan reconfiguring section, and a travel control section which controls travel of the vehicle based on a travel plan. When a non-stop state of the engine occurs while the vehicle is traveling, the travel plan reconfiguring section reconfigures the initial travel plan so that target deceleration in the decelerating interval in the initial travel plan is reset to new target deceleration that is larger deceleration. [A1064]

"Crop feeler system and method"

In some embodiments, a crop feeler system automatically executes a navigational task based on a proximity of a vehicle to an obstacle. The crop feeler system includes a hub attached to the vehicle. Inside the hub are two oscillating circuits each having an oscillating frequency. A member is coupled to the hub. Two inductive elements are positioned within the member so that, when the obstacle comes into contact with the member, at least one of the inductive elements moves closer to at least one of the oscillating circuits and alters the oscillating frequency of that oscillating circuit. A navigation sensor measures the oscillating frequency of the oscillating circuit, identifies a navigational task using the oscillating frequency of the oscillating circuit, and executes the navigational task. [A1065]

"Positioning using observer-based time-of-arrival measurements"

A method of determining a position of a target device includes: sending a first measurement signal from a first known-position device, receiving the first measurement signal at a second known-position device, receiving a first acknowledgement signal from the target device at the first known-position device and at the second known-position device, determining the position of the target device using first timing information associated with the first measurement signal and the first acknowledgement signal, a first position of the first known-position device, and a second position of the second known-position device. [A1066]

"Rear cross traffic alert device"

Provided is a rear cross traffic alert device that allows a driver to understand that notification of the presence of an object (another vehicle, etc.) in an area directly behind the vehicle cannot be notified. The rear cross traffic alert device provided on a vehicle includes: an object detection section configured to detect the presence of an object laterally behind the vehicle, a movement determination section configured to determine whether or not the object has entered a predetermined area in a detection area in which the object detection section can detect the presence of the object, and a notification control section configured to stop notification when the movement determination section has determined that the object has entered the predetermined area. [A1067]

"Filtering method and filter device for sensor data"

A filtering method for sensor data formed by a sensor system for acquiring objects, including: measurement of a scaling value from the sensor data, the scaling value corresponding to a change in size of an object from the sensor data over a time interval, determination of a measurement error parameter of the scaling value, and execution of a Kalman filtering based immediately on the measured scaling value, the time interval, and the measurement error parameter, in order to estimate at least one normalized motion parameter of the object relative to the sensor system. A related filter device, a driver assistance system, and a computer program are also described. [A1068]

"Method and device for imaging an object using electromagnetic high frequency radiation"

A device for imaging an object by electromagnetic high frequency radiation including at least one detector for electromagnetic high frequency radiation and at least one imaging device for generating a focus. To provide a device for and a method of imaging an object by electromagnetic high frequency radiation, which makes it possible to detect even a rapidly moving object with a high level of resolution, it is proposed that the device has at least one controllable element for changing the beam direction, which is so adapted that the focus of the imaging device is movable. [A1069]

"High resolution Doppler collision avoidance radar"

An example radar apparatus has a transmission frequency modulated by a chirp waveform having three chirp segments, including increasing, decreasing, and a constant frequency segments. The chirp waveform may extend over the full revisit time of the radar beam. The frequency difference between the transmitted and echo signals are determined at least once per chirp segment. Example apparatus include a Doppler radar for vehicle use. [A1070]

"Monostatic multi-beam radar sensor for motor vehicles"

A radar sensor for motor vehicles includes a plurality of transmission and receiving antennas, which differ in their azimuthal directivity characteristic and to which a separate mixer is assigned, which mixes a transmitted signal with a received signal, at least one of the mixers being a transfer mixer, and at least one other of the mixers having a lower transfer output, wherein the assignment of the transmission and receiving antennas is asymmetrical with respect to the mixers differing in their transfer output. [A1071]

"Navigation system and method"

A navigation system and associate methods are described that include a plurality of fixed terrestrial based reference devices that calibrate the system by tracking positional error between the fixed terrestrial based reference devices. A navigation system and associated methods are also described that include a laser positioning system. A navigation system and associated methods are described that include an RF positioning system. In one example, the laser positioning system, and the RF positioning system cross check one another to ensure reliability and accuracy of a position measurement. [A1072]

"Rotor blade for a wind turbine, and a combination of a radar station and a wind turbine"

A rotor blade for a wind turbine includes a casing structure made of flat fiber composite material that forms the rotor blade surface. To reduce interferences to radar systems caused by the use of the rotor blade, at least at the leading edge and the trailing edge of the rotor blade is provided with a fiber composite material is designed for providing a frequency-dependent radar reflection factor for radar radiation that is incident perpendicular to the surface and which has a reflection minimum at a given frequency in the range of 1 GHz to 10 GHz. [A1073]

"Device and method for detection of water flow in ground"

The invention relates to a device and a method to determine whether a water leakage has occurred in ground by means of Doppler radar. The device comprises a radar emitting unit for emitting electromagnetic waves into the ground, a receiver unit for receiving signals reflected from a fluctuating water surface, a signal processing unit which band pass filters the received signal to obtain a signal that only comprises the Doppler shifted frequencies, creates a measure of the derivative of the reflected signal and, in a decision processor, compares this measure with a threshold value corresponding to the signal value of the background. If the measure of the derivative exceeds said threshold value a leakage is considered to have occurred. [A1074]

"Change detection method and system for use in detecting moving targets behind walls, barriers or otherwise visually obscured"

A system and method for locating a moving target behind a wall or barrier comprising: providing a plurality of images of the region of interest, selecting a reference image from the plurality of images, forming a predetermined number of difference images by subtracting the absolute value of the pixels of the reference image from the absolute values of pixels in a predetermined number of the plurality of images, eliminating negative pixel values in the predetermined number of difference images, minimizing the side lobes to form a combined difference image for each reference frame, selecting another reference image from the plurality of images and performing the steps of forming a plurality of difference images, eliminating negative pixel values, averaging the resulting predetermined number of difference images and minimizing the side lobes for each selected reference image to form a set of combined difference images which contain the moving target signature. [A1075]

"Realization of time-domain ultra wideband ground-penetrating radar using high speed accumulation and interpolated sampling"

Embodiments of the disclosed technology use high-speed interpolated (interdigitated) sampling for the specific purpose of GPR (Ground-Penetrating RADAR) . This technology solves several issues associated with high-speed sampling in GPR which included 1) dynamic range limitations, 2) regulatory compliance issues, 3) sampler core offset error, and 4) timing errors. High-speed interpolated sampling GPR is implemented using a high-speed ADC in combination with trigger logic (such as an FPGA) and a programmable delay generator. The FPGA or other trigger logic generates a series of randomly dithered trigger pulses. A variable delay generator (or "Vernier") is synchronously controlled in order to produce the fractional timing. The timing of the pulses is randomly or pseudo-randomly dithered, and the phase of the interpolation is shuffled in order to avoid producing discrete spectral lines in the radiated RADAR signal. [A1076]

"Apparatus, system and method of calibrating a radio delay of a wireless device"

Some demonstrative embodiments include devices, systems and/or methods of calibrating a radio delay. for example, a radio delay calibrator may calibrate at least one radio delay of a radio of a wireless communication device based on one or more calibration messages received by the wireless communication device from one or more other wireless communication devices, the calibration messages including calibration information, which is based on radio delays of the one or more other wireless communication devices. [A1077]

"Velocity measurement apparatus capable of accurately measuring velocity of moving object relative to ground surface"

A velocity measurement apparatus comprising: first and second surface profile sensors for acquiring first and second surface profile data, a memory for storing the first and second surface profile data, and a calculation unit for calculating a velocity of a moving object. Each surface profile sensors acquires the corresponding surface profile data by measuring signal levels of reflected waves corresponding to a radio wave emitted to a ground surface and then reflected from structures on the ground surface, and measuring propagation durations from the emission of the radio wave to the return of the respective reflected waves. The calculation unit compares the first and second surface profile data, determines a difference between their measurement times, and divides a distance between the first and second surface profile sensors by the difference between the measurement times to calculate the velocity of the moving object. [A1078]

"System for doppler positioning of seismic sensors and method"

Method and system for determining positions of underwater sensors. The method includes sending a Doppler variant signal from a moving source, recording the signal with the at least one seismic sensor, evaluating a frequency drift of the recorded signal, and determining a position of the at least one seismic sensor based on the evaluated frequency drift and a source movement relative to the at least one sensor. [A1079]

"System and method for vehicle navigation using lateral offsets"

A navigation system for use in a vehicle (402) . The system includes an absolute position sensor, such as GPS, in addition to one or more additional sensors, such as a camera, laser scanner, or radar. The system further comprises a digital map or database that includes records for at least some of the vehicle's surrounding objects (400) . These records can include relative positional attributes with respect to a reference axis (404) . As the vehicle (402) moves, sensors sense the presence of at least some of these objects (400) , and measure the vehicle's relative position to those objects. This information is used to determine the vehicle's instantaneous lateral offset (428) relative to the reference axis (404) , and support features such as enhanced driving directions, collision avoidance, or automatic assisted driving. The system also allows new objects (408, 414) to be attributed using relative positioning, and thereby factored into the enhanced navigation features. [A1080]

"Driver assistance system"

A driving aid system is provided for assisting a motor vehicle during a change of lane. The system includes a device monitoring the lateral side space and a device monitoring the directional stability. The lateral space monitoring device is designed to determine the degree of risk (for example, two levels: dangerous/not dangerous, or three levels: low/medium/high risk) represented by a change of lane. At the high risk level, a first driving aid reaction occurs, at least in the form of a counter-steering, which is regulated by a link existing between the lateral space monitoring device and the directional stability monitoring device and is expressed by a reorientation towards the specific traffic lane or by maintaining the directional stability. At the low risk level, a second driving-aid reaction is triggered, which is less perceptible and depends on the degree of likelihood of the intention to change lane. [A1081]

"Method for monitoring the level of an ethylene polymerization catalyst slurry"

The present invention relates to a method for monitoring the level of an ethylene polymerization catalyst slurry in a mud pot (2) , whereby said catalyst slurry is prepared by introducing a solid catalyst and a liquid diluent in said mud pot (2) , and whereby through sedimentation an interface (35) is formed between said diluent and the obtained catalyst slurry, characterized in that said interface (35) is monitored with Time Domain Reflectometry. [A1082]

"System for detecting sea-surface wind, using satellite observation, and a method for detecting sea-surface wind"

Systems and methods are provided that involve obtaining emissivity and reflectivity by the ratio of the radiance temperature versus the sea level temperature as observed by a satellite, and may further calculate two reflectivity values observed or simulated by the vertical or horizontal polarized channels of microwave, and then estimate a surface roughness. Further, illustrative implementations may involve obtaining the regression relation expression between the surface roughness and the wind strength and then detecting the sea-surface wind, using the information observed by the satellite again. As such, the sea-surface wind information can be obtained through satellite observation, and the information can be utilized for preventive activities against disaster including typhoon, the energy industry including wind power and the fishery in quasi-real time. [A1083]

"Radar sensor for motor vehicles, in particular RCA sensor"

Radar sensor for motor vehicles, including a transmitting antenna in the form of a planar array antenna having multiple adjacent antenna elements, and including a power supply system for supplying the antenna elements with microwave power. The power supply system is designed for supplying each pair of directly adjacent antenna elements with microwave power in phase opposition. [A1084]

"Driving support apparatus for vehicle"

There is provided a driving support apparatus for a vehicle. When a height of a three-dimensional object extracted as a control subject is less than a set height, and as the height of the control subject becomes lower, a driving control unit increases the range of the braking control that is sequentially inhibited in the stepwise manner from the highest braking level to the lowest braking level. [A1085]

"Multibeam radar apparatus for vehicle, multibeam radar method and multibeam radar program"

An on-board multibeam radar apparatus includes a plurality of beam elements that constitute an antenna transmitting a transmission wave and receiving an incoming wave reflected by and arriving from a target in response to the transmission wave, and a processing unit configured to apply a Fourier transformation to beam element data which are data of a received wave received through the plurality of beam elements based on the number of elements and the element interval of a desired virtual array antenna so as to create virtual array data, and to perform a predetermined process based on the created virtual array data. [A1086]

"System and method of visualization of species characterization, dynamics and stratification of the magnetosphere"

A method for collecting data of species in the magnetosphere includes the steps of: (a) tuning at least one laser to spectral indices of targeted atomic or molecular species located in the magnetosphere, and (b) measuring fluorescence radiation from each of the targeted species, in response to the tuning step. The method determines range to each of the targeted species. The method geo-locates the species with respect to the Earth to provide a registered map of the targeted species in three dimensions (3D) with respect to the Earth, and temporally trends each of the targeted species to provide the registered map in four dimensions (4D) . The method may also determine abundance from multiple wavelengths returned from the fluorescence radiation of the targeted species. [A1087]

"Measurement device, measurement system, measurement method, and program"

Provided is a technique capable of suppressing the deterioration in azimuth resolution and distance resolution in even a modulated and transmitted or received signal or a signal reflected by an object and varied in intensity when acquiring waveform information. A measurement device comprise: a plurality of sensors which receive waves propagating through a space, and a sampling timing calculation means which obtains, on the basis of the relative positions of the sensors and the velocities of the waves, the difference between the arrival times of the waves received by the respective sensors and calculates, for each sensor, sampling timing for acquiring the waveform information relating to the waves, on the basis of the difference between the arrival times. [A1088]

"Method and system for locating signal emitters using cross-correlation of received signal strengths"

A method and system for determining a location of a first device that emits a signal: provide at least three sensors separated and spaced apart from each other, at each of the sensors, receive the signal emitted by the first device, determine the received signals for each of the sensors, determine cross-correlations of the received signals for pairs of the sensors, and determine the location of the first device from the magnitudes of the cross-correlations of the received signals. [A1089]

"Sensor suite and signal processing for border surveillance"

A land-based Smart-Sensor System and several system architectures for detection, tracking, and classification of people and vehicles automatically and in real time for border, property, and facility security surveillance is described. The preferred embodiment of the proposed Smart-Sensor System is comprised of (1) a low-cost, non-coherent radar, whose function is to detect and track people, singly or in groups, and various means of transportation, which may include vehicles, animals, or aircraft, singly or in groups, and cue (2) an optical sensor such as a long-wave infrared (LWIR) sensor, whose function is to classify the identified targets and produce movie clips for operator validation and use, and (3) an IBM CELL supercomputer to process the collected data in real-time. The Smart Sensor System can be implemented in a tower-based or a mobile-based, or combination system architecture. The radar can also be operated as a stand-alone system. [A1090]

"Object detection system and method"

The present invention relates to an object detection system and method for determining range and velocity of a target object by transmitting a frequency modulated continuous wave transmission signal and receiving transmission signal reflections of the transmission signal from the target object as a reception signal. Each modulation block of the transmission signal comprises a number of first type chirps, each first type chirp having a first slope, and a number of second type chirps, each second type chirp having a second slope different from the first slope. Two consecutive chirps of the same type have a frequency offset A mixed signal based on the transmission signal and the reception signal and using the first type chirps and the second type chirps is processed, in order to determine the range and velocity of the target object. [A1091]

"Filling level determination using transmit signals with different frequency steps"

A method of determining a filling level comprising transmitting a first transmit signal exhibiting a first ratio between bandwidth number of frequencies, receiving a first reflection signal, mixing the first transmit signal and the first reflection signal to form a first intermediate frequency signal, and determining a first data set indicative of a first set of surface echo candidates based on the first intermediate frequency signal. The method further comprises transmitting a second transmit signal exhibiting a second ratio between bandwidth and number of frequencies being different from the first ratio, receiving a second reflection signal, mixing the second transmit signal and the second reflection signal to form a second intermediate frequency signal, and determining a second data set indicative of a second set of surface echo candidates based on the second intermediate frequency signal. The filling level determined based on subsets of the first and second sets. [A1092]

"Electromagnetic detection and imaging transceiver (EDIT) and roadway traffic detection system"

An automatic frequency control is used to keep a continuous wave (CW) transmission tuned to the resonant frequency of a resonant microwave patch antenna (RMPA) . Changes in loading and the bulk dielectric constant of the mixed media in front of the RMPA will affect its resonant frequency and input impedance. A significant shift in the measured input impedance is interpreted as an object moving nearby, and the phase angle of the measured input impedance is used to estimate the direction of an object's movement. [A1093]

"Drive assist device, and vehicle using drive assist device"

A drive assist device includes a light source that irradiates a detection target with light, a first lens having a first area through which the irradiated light from the light source passes, a second lens having a second area through which reflected light reflected from the detection target passes, and a light receiving element that receives the reflected light that passes the second lens. The first area and the second area are arranged to be in align with each other, in width direction of the drive assist device. [A1094]

"Event data recorder having traffic monitoring and warning function within safe range"

An event data recorder providing traffic monitoring and warning functions within a safe range is revealed. The event data recorder includes a main body, a plurality of image capture units for capturing an image outside the vehicle and generating an image signal, a vehicle signal capture unit capturing a vehicle signal and sending the vehicle signal into the main body, a sound capture unit that records engine and environmental sounds to generate a sound signal, a storage unit for storage of data. The main body performs data processing and image recognition according to the image and vehicle signals to generate a control signal and check whether the unsafe driving behavior occurred. If the unsafe driving behavior occurred, a warning signal is transmitted to the warning unit to warn the driver. Thus the driving safety is enhanced and the driver's responsibility for accidents is determined. [A1095]

"Calibration of large phased arrays using fourier gauge"

Methods and apparatus for a calibration system including a support structure movable over an array, a super-element secured to the support structure to obtain information at selected locations in relation to the array, and a processor to compute a sum of voltages for determining a level of calibration for the array. [A1096]

"System and method for displaying weather information"

Provided in one embodiment is a weather radar system, comprising: processing electronics configured to: determine (i) a presence of a turbulence at a target based on the weather radar return data received from an input device as a result of at least one scan of the target and (ii) positional information, which comprises at least one altitudinal coordinate of at least one of the target and the turbulence, and display the positional information with respect to the weather radar system on a weather image on a vertical situation display. [A1097]

"Ground clutter rejection for weather radar"

A weather radar system is coupled to a weather radar antenna. The weather radar system includes a processor for combining or summing portions of the radar return data to obtain a null. The processor associates the null with the ground (e.g., steers the null toward ground or processes data so that the null corresponds to ground) to obtain a null to alleviate ground clutter when sensing weather. The null can be a single null or multiple nulls associated with different ranges. [A1098]

"Determination of object heading based on point cloud"

An autonomous vehicle configured to determine the heading of an object-of-interest based on a point cloud. An example computer-implemented method involves: (a) receiving spatial-point data indicating a set of spatial points, each spatial point representing a point in three dimensions, where the set of spatial points corresponds to an object-of-interest, (b) determining, for each spatial point, an associated projected point, each projected point representing a point in two dimensions, (c) determining a set of line segments based on the determined projected points, where each respective line segment connects at least two determined projected points, (d) determining an orientation of at least one determined line segment from the set of line segments, and (e) determining a heading of the object-of-interest based on at least the determined orientation. [A1099]

"Radar device and method of calculation of receive power in radar device"

An electronic scan type radar device which uses a high resolution performance processing to estimate directions of arrival of radio waves, wherein powers of arrival waves received for targets are accurately calculated, that is, a vehicle-mounted radar device utilizing electronic scan which uses a predetermined angle estimation system to estimate directions of arrival of reflected waves, comprising finding mode vectors for angles calculated from the receive signals of the antennas, decomposing a vector of the receive signals into directions of the mode vectors, and defining the lengths of the decomposed vectors the receive powers of the reflected waves arriving from the targets. Due to this method, even if there are targets, it is possible to accurately calculate the powers of the arrival waves, whereby pairing is accurately performed, the precision of detection of targets is improved, and erroneous operation of a vehicle-mounted radar device utilizing electronic scans is prevented. [A1100]

"TREES-tree root examination, evaluation and standardization"

This invention will be an apparatus, system and use of Ground Penetrating Radar (GPR) as a noninvasive and non-destructive means to detect and examine tree roots, below grade of the soil surface. This invention will provide a means and methodology for objective evaluation of tree root defects based upon standards for urban trees at all levels of the Nursery Tree Industry. The output from software algorithms will provide guidance for remediation of defects when appropriate, inventory and management data for proactive maintenance at all levels of the supply chain. This apparatus, system and methodology will be a new and useful process at all levels of the supply chain for nursery tree stock. [A1101]

"Systems and methods for a RFID enabled metal license plate"

In the embodiments described herein, a RFID enabled license plate is constructed by using the license plate, or a retro-reflective layer formed thereon as part of the resonator configured to transmit signals generated by and RFID chip integrated with the license plate. Such an RFID enabled license plate can include a metal license plate with a slot formed in the metal license plate, and a RFID tag module positioned in the slot. The RFID tag module can include a chip and a loop, and the loop can be coupled with the metal license plate, e.g., via inductive or conductive coupling. In this manner, the metal license plate can be configured to act as a resonator providing increased performance. [A1102]

"Navigation system configured to integrate motion sensing device inputs"

A navigation system can comprise a microprocessor, a memory, a navigational signal receiver configured to receive a radio signal from at least one external system, a motion sensing device, and a navigation program executable by the microprocessor. The navigational signal receiver can be communicatively coupled to the microprocessor via a communication port. The navigation program can be configured to receive messages from the navigational signal receiver by communicating to the driver of the communication port. The communication port driver can adjust the current position based on the data returned by the motion sensing device. [A1103]

"Apparatus and method for detecting target in near field"

An apparatus for detecting a target in near field in accordance with an exemplary embodiment of the present invention includes: an RF transceiver configured to generate a transmitting signal of a frequency modulated continuous wave (FMCW) and delay the signal as much as a desired time, a transmitting and receiving antenna unit configured to transmit and receive the a transmitting signal and the received signal, and a signal processing unit configured to extract a range or a velocity of the target from the signal provided from the RF transceiver. [A1104]

"Method and device for continuous wave radar measurements"

This invention relates to a method for determining at least one of a distance and a relative velocity by means of continuous wave radar measurements. The method includes generating a measurement signal in the form of a continuous wave radar signal, transmitting the measurement signal by means of an antenna (112) , reflecting the measurement signal by means of a reflector (118) , thereby providing a desired reflected measurement signal, receiving the desired reflected measurement signal, and determining at least one of a distance and a relative velocity between the antenna and the reflector by means of the desired reflected measurement signal. The reflection of the measurement signal involves asymmetrically modulating the measurement signal at the reflector. The determination of at least one of a distance and a relative velocity includes detecting the desired reflected measurement signal among several received reflections of the measurement signal, by means of information added by the asymmetric modulation. [A1105]

"Direction of arrival (DOA) estimation using multiple offset receive channels"

In an example method, a vehicle is configured with a radar system used to aid in vehicle guidance. The method could include an array of antennas plurality of antennas configured to receive a radar signal. The array of antennas has a respective spacing between the given antenna and an adjacent antenna, however, the plurality of spacings includes at least two different spacings. A portion of the method may be performed by a processor configured to calculate a detection channel, based on a difference between differential phases associated with two antenna pairs in the array. The processor may also calculate an unambiguous angle based on the detection channel and the plurality of antenna spacings. Additionally, the processor may control the radar unit based on the calculated unambiguous angle. [A1106]

"System and method for detecting vehicle crash"

A device is provided for use with a vehicle. The device includes a mode-determining component, a first detecting component and a second detecting component. The mode-determining component can generate an in-vehicle signal. The first detecting component can detect a first parameter and can generate a first detector signal based on the first detected parameter. The second detecting component can detect a second parameter and can generate a second detector signal based on the second detected parameter. The mode-determining component can further generate a crash mode signal based on the in-vehicle signal, the first detector signal and the second detector signal. [A1107]

"Vehicle surroundings monitoring device"

A vehicle surroundings monitoring device includes a moving direction determining unit 20 which determines whether a physical body is moving in a traveling direction of a self vehicle or a transverse direction orthogonal to the traveling direction, from a change in a detection position of the physical body by a laser radar 8, wherein a classification determining unit 21 executes a first classification determining process of determining the physical body determined to be moving in the traveling direction as a four-wheel vehicle when dimensions of the physical body obtained from the detected position by the laser radar 8 is within a range of A1, and a second classification determining process of determining the physical body determined to be moving in the transverse direction as the four-wheel vehicle when the dimensions of the physical body obtained from the detected position by the laser radar 8 is within a range of B1. [A1108]

"Method for detecting objects"

In a method for detecting objects, at least one sensor emits a transmitting pulse as a wave, particularly as an acoustic or an electromagnetic wave, which wave is reflected at least partially by objects in the propagation space, and the reflected wave being detected by at least one receiver as a received signal. The received signal of the reflected wave is divided up into segments, and from the individual segments, data are gathered that are drawn upon for the determination of an object hypothesis. [A1109]

"Mixer assembly and radar sensor for motor vehicles"

Mixer unit for a radar sensor for motor vehicles, having an I mixer and a Q mixer which are connected in parallel branches between an oscillator port and an RF port with the aid of power splitters. A switch is situated between each of the power splitters and the Q mixer which allows the signal arriving from the power splitter to be selectively decoupled from the Q mixer and switched to a high-frequency ground. A transformation element is provided between the high-frequency ground and the particular node point of the power splitter which transforms the high-frequency ground into an open line at the node point. [A1110]

"Three dimensional radar system"

A system and a method of generating a three-dimensional terrain model using one-dimensional interferometry of a rotating radar unit is provided herein. Height information is evaluated from phase differences between two echoes by applying a Kalman filter in relation to a phase confidence map that is generated from phase forward projections relating to formerly analyzed phase data. The radar system starts from a flat earth model and gathers height information of the actual terrain as the platform approaches it. Height ambiguities are corrected by removing redundant 2.pi. multiples from the unwrapped phase difference between the echoes. [A1111]

"System and method for verifying displayed terrain information"

An apparatus for use with a weather radar system having a radar antenna, the apparatus for mounting to an aircraft and for verifying terrain features shown on an electronic display, the terrain features based on terrain data from a terrain database. The apparatus includes processing electronics configured to receive radar return data from the weather radar system and configured to correlate the radar return data with the terrain data. The processing electronics using the correlation to provide an indication as to whether the terrain features displayed on the electronic display are correct or incorrect. [A1112]

"Vechicle-mounted radar apparatus"

A vehicle-mounted radar apparatus for transmitting radar waves toward the outside of a vehicle mounting the apparatus thereon and receiving the radar waves reflected from an object to thereby acquire information about the object. In the apparatus, a target detection unit transmits and receives the radar waves to detect positions of targets. An object position determination unit determines a position of the object reflecting the radar waves on the basis of the positions of the targets. A representative target selection unit selects a representative target from the targets detected by the target detection unit. A same-object target selection unit selects targets belonging to the same object as the representative target. A large-vehicle determination unit determines whether or not an extent of the targets selected by the same-object target selection unit is equal to or greater than a predetermined threshold value for large-vehicle determination. [A1113]

"Ice data collection, processing and visualization system"

Autonomous Underwater Vehicles (AUV) collect and transmit information about ice floe thickness, this is combined with SYNTHETIC APERTURE RADAR images from satellites to identify and track dangerously thick regions of ice. The overlayed data is presented graphically to allow tracking of the thick ice regions over time. This information is used to alert drilling platforms in icy ocean conditions of pending ice floe dangers. [A1114]

"Method for operating an electrical device and electrical device"

The invention relates to a method for operating an electrical device which during operation emits electromagnetic radiation at least temporarily, and to a method for operating a locating device for identifying objects. The method for operating an electrical device is characterized in that the presence of an external radiation source or radio communication service is detected. The invention also relates to an electrical device, especially a locating device comprising at least one UWB sensor, which device is operated according to the method of the invention. [A1115]

"Slot antenna and radar device"

This disclosure provides a slot antenna, which includes a tubular electromagnetic wave radiation part having a hollow space, a plurality of electromagnetic wave radiating slots for radiating electromagnetic waves being formed in at least a part of a side surface of the radiation part and a plurality of feeding slots for being inputted with the electromagnetic waves being arrayed in line in another part of the side surface opposing to the radiating slots, a feeding part having a hollow space, extending along the feeding slot array, and for feeding power from the outside of the radiation part to the feeding slots, and a power guiding part having a hollow space and for guiding the power to the feeding part, the power guiding part extending in a direction orthogonal to the array direction of the feeding slots and in parallel to the center axis of the radiation part, from a location of the feeding part corresponding to at least one of the feeding slots. [A1116]

"Radar level gauge system with reduced antenna reflection"

A radar level gauge system for determining a filling level in a tank. The radar level gauge system comprises a transceiver, a horn antenna having a first opening connected to the transceiver and a second opening facing a surface of the product in the tank, and processing circuitry connected to the transceiver for determining the filling level based on an electromagnetic surface reflection signal. The horn antenna is configured in such a way that an electrical distance from the first opening to the second opening, along a path defined by an intersection between a wall of the horn antenna and a half-plane starting from and extending in parallel with a cone axis of the horn antenna, is different for different orientations of the half-plane with respect to the cone axis. Hereby, disturbance from an antenna reflection signal can be reduced, which provides for improved measurement of high filling levels. [A1117]

"Roadside detection system, driver assistance system and roadside detecting method"

A roadside detection system installed in a vehicle to detect a roadside of a road on which the vehicle travels includes detection results acquiring means, first edge line detecting means and second edge line detecting means. The detection results acquiring means emits light waves or electromagnetic waves to a target detection region in which an object to be measured is detected and acquires an objective distance and a reflection intensity, for each of separate regions obtained by separating the target detection region into a plurality of divisions. The first edge line detecting means detects a first edge line that is a candidate of a roadside based on each objective distance. The second edge line detecting means detects a second edge line that is a candidate of a roadside based on each reflection intensity. A driver assistance system and a roadside detecting method are also provided. [A1118]

"Closest to optimal answer selection technique for single-ship geolocation"

Techniques are disclosed for selecting a closest to optimal radar/emitter location for single-ship applications. In accordance with some embodiments, given single-ship geolocation estimates are organized so that clusters of those estimates can be identified, wherein optimal solutions may be found in consecutive, adjacent segments of distance (bins) along each axis of given a coordinate system. Once the clusters are identified in each axis, an optimal cluster can be selected for each. To determine the closest answer to optimal, the coordinate data points in each of the optimal clusters can be averaged (or other sound mathematical process) for each axis in the coordinate system, so as to provide an optimal 3-D coordinate in the given coordinate system. In other embodiments, the optimal 3-D coordinate can be further used to establish an origin in a second coordinate system (e.g., for conversion from 3-D to 2-D coordinate system) . [A1119]

"Ship heading and pitch using satellite ephemerides and radar range measurement of satellite"

There may be situations in which a ship at sea is lost and GPS is not available due to jamming, and neither a position fix nor GPS is available, or the heading and attitude sensors are degraded. A system and method allow estimating a ship's heading and pitch using radar range measurements, multiple antennas and satellite ephemeris data. [A1120]

"Internal multi-axis G sensing used to align an automotive forward radar to the vehicle's thrust axis"

A motor vehicle includes a vehicle floor, a tilt sensor attached to the vehicle floor and having an output, and a forward looking radar module attached to the vehicle. The radar module includes a radar, an accelerometer, and an output from the accelerometer, and a controller that averages the tilt sensor output and the accelerometer output and determines a difference between the output averages, the controller reporting when the differences changes more than a predetermined amount. A method of calibrating the forward looking radar module, when attached to a vehicle, comprises placing the vehicle on a flat surface to determine the accelerometer pitch. [A1121]

"Electronic apparatus, method of making the same, and transceiving device"

An electronic apparatus includes a metal base, a wiring board disposed on the metal base, the wiring board having an opening and including interconnects, a metal stage dispose in the opening, the metal stage serving as a ground line, and a semiconductor device disposed on the metal stage, wherein an area of an end surface of the metal stage facing the metal base is larger than that of the metal stage facing the semiconductor device. [A1122]

"System and method for TCAS based navigation"

A traffic collision avoidance system (TCAS) based navigation system including a TCAS equipped with a directional antenna, the TCAS configured to generate a RF transmission pattern at a selected frequency, the transmission pattern including a plurality of directional beams, receive a plurality of RF signals reflected from the ground across a selected frequency band, the selected frequency band including the selected frequency, and measure frequency differences between one or more beams of the plurality of RF beams and one or more beams of the plurality of RF signals reflected from the ground, and a computing systems in communication with the TCAS, the computing system configured to calculate a ground speed of the aircraft utilizing the measured frequency differences, calculate a drift angle of the aircraft utilizing the measured plurality of frequency differences, receive a heading reference of the aircraft, and determine an aircraft navigation parameter of the aircraft. [A1123]

"Vehicle localization using surface penetrating radar"

Described are a method and a system for localization of a vehicle. The method includes the acquisition of SPR images of a subsurface region along a vehicle track. Acquired SPR images are compared to SPR images previously acquired for a subsurface region that at least partially overlaps the subsurface region along the vehicle track. In some embodiments, the comparison includes an image correlation procedure. Location data for the vehicle are determined based in part on location data for the SPR images previously acquired for the second subsurface region. Location data can be used to guide the vehicle along a desired path. The relatively static nature of features in the subsurface region provides the method with advantages over other sensor-based navigation systems that may be adversely affected by weather conditions, dynamic features and time-varying illumination. The method can be used in a variety of applications, including self-driving automobiles and autonomous platforms. [A1124]

"Method and system for adaptively cancelling clutter from the sidelobes of a ground-based radar"

A system and method of providing to a beamformer a modified complex beam steering vector includes collecting subarray I/Q samples from a plurality of subarrays receiving clutter, performing coherent integration of the subarray I/Q samples to increase the CNR, adaptively modifying a complex beam steering vector to form a null in the direction of the received clutter, and outputting to a beamformer the modified complex beam steering vector. The beamformer receives complex I/Q data samples representing a radar signal containing near-horizon clutter and applies the modified beam steering vector to generate a beamformed signal having an elevated mainlobe and a spatial sidelobe null in the direction of the received clutter. [A1125]

"Method, device and program for displaying echo image"

This disclosure provides an echo image display device, which includes an antenna for discharging electromagnetic waves and receiving echo signals reflected on one or more target objects, an echo signal input unit for inputting the echo signals from the antenna, an echo signal level detector for detecting a level of each of the echo signals with reference to a distance and an azimuth from the antenna, an image data generating module for generating image data based on the levels of the echo signals, a display unit for displaying the image data, and a data amount changing module for changing a data amount rate of a predetermined area that is set as a part of a display area of the display unit, into a different rate in another part of the display area. [A1126]

"Method and device for detecting azimuth"

A device for detecting an azimuth has a transmission array antenna having plural transmission antenna elements arrayed along an array axis and a receiving array antenna having plural receiving antenna elements arrayed along the array axis. A reception signal is acquired for each of channels by transmitting and receiving a search wave through each of the channels. The channels are arbitrary combinations of each of the transmission antenna elements and each of the receiving antenna elements. A first spatial frequency analysis is performed along the array axis of either ones of the transmission antenna elements and the receiving antenna elements using the reception signal. A second spatial frequency analysis is then performed along the array axis of the other ones of the antenna elements using results of the first spatial frequency analysis. An azimuth of a target is determined based on analysis results from the second spatial frequency analysis. [A1127]

"Method and apparatus for detecting vehicle wheels"

A method for detecting the wheels of a vehicle that is traveling on a roadway in a travel direction and whose wheels project downward from the vehicle body and are at least partially exposed laterally at the level of the vehicle body, with the steps: emitting a concentrated electromagnetic measurement beam with a known temporal progression of frequency from the side of the roadway onto an area a predetermined distance above the roadway and at a slant with respect to the travel direction, receiving the measurement beam reflected by a passing vehicle and recording the temporal progression, relative to the known progression, of its frequency, and detecting a rectangular pulse occurring in the recorded progression within the time period when the vehicle body passes, as a wheel. [A1128]

"Mobile mapping in underground or shielded environments"

A method for providing location information such as a map in an underground or shielded environment entails storing first near-field communication (NFC) data obtained by reading a first NFC tag at a first location, reading a second NFC tag at a second location, obtaining map data for an area encompassing the first and second locations, and displaying a map showing the first location and the second location. [A1129]

"Collision avoidance system and method of detecting overpass locations using data fusion"

A collision avoidance system adapted for use with a vehicle, and a method of modifying a first warning assessment algorithm of the system to reduce false alerts caused by overpasses, and maintain sufficient warning distances are presented, wherein the system includes at least one sensor operable to detect an object location, a locator device operable to determine the current position coordinates of the vehicle, a map database presenting a plurality of overpass locations ahead of the vehicle, and an electronic control unit operable to execute a second algorithm, if the detected object location generally matches an overpass location, and in a preferred embodiment, a third algorithm, if the detected location does not match an overpass location, such that the third algorithm is executable over a shorter period than the second, and the second algorithm is executable over a shorter period than the first. [A1130]

"High speed angle-to-target estimation for a multiple antenna system and method"

A multiple beam receiving system provides an angle estimate to targets. The system tracks movements of the targets over time and generates calibration information. The system uses the calibration information to more accurately estimate angle-to-target. The multiple beam receiving system can be part of a monopulse or other radar system, a traffic collision avoidance system, or other electromagnetic sensor. [A1131]

"RFID skier monitoring systems and methods"

A system and method monitor skier behavior. An identifier is read from a lift access product when the lift access product is in the vicinity of a lift boarding area and a scan record containing the identifier, location information of the lift boarding area and a time stamp if generated. The scan record is processed to generate a location event record that is stored within a location database. The location database is processed to determine skier behavior based upon the location event records. [A1132]

"Storm advection nowcasting"

Embodiments of the invention can predict the ground location and intensity of storm cells for a future time using radar reflectivity data. In some embodiments, a Sinc approximation of the general flow equation can be solved to predict the ground location and intensity of a storm cell. In some embodiments, to solve the Sinc approximation the velocity of a storm cell can be estimated using various techniques including solving the flow equation in the frequency domain. The results can provide efficient prediction of storm cell position in nowcasting applications. [A1133]

"FMCW radar sensor for motor vehicles"

FMCW radar sensor for motor vehicles, having at least one antenna element and a modulation device for feeding the antenna element using a frequency-modulated transmission signal, whose frequency periodically sweeps a frequency band, characterized in that the antenna element has multiple subelements, which are positioned in a vertical column and fed serially, and the modulation device is implemented for the purpose of variably setting the frequency position of the frequency band. [A1134]

"Ultra-sensitive system for measuring distance or position"

It is an object of the present invention to provide a system with which 3-dimensional position can be accurately measured. Plural UWB transmitter-receivers (1) , periodically transmitting PN codes of M system and preliminarily disposed on known positions are provided, a server (3) to synchronize the plural UWB transmitter-receivers (1) is provided, an RF tag (T) , attached to a moving object (20) as to receive signals (I.sub.0) synchronously and periodically transmitted from the UWB transmitter-receivers (1) and reflect the signals (I.sub.0) adding inherent tag recognition signal, is provided, and the UWB transmitter-receiver (1) is composed as to obtain the distance to the moving object (20) attached with the RF tag (T) by synchronous summation and correlative calculation of the PN codes of M system reflected by the RF tag (T) . [A1135]

"Human presence detector suitable for concealment and using a shaped microwave beam"

A presence detector unit (PDU) of the type relying on microwave radiation provides a signal indicating movement within a defined space when such movement occurs. A source of microwave radiation within a housing projects a beam of microwave radiation directed through a side of the housing to suffuse at least a portion of the defined space. A detector within the housing senses changes in microwave radiation reflected back toward the detector. An adjustable beam occlusion structure is supported by the housing and blocks a portion of the microwave radiation emanating from the source and through the side of the housing. [A1136]

"Method and system for recognizing space of shoulder of road"

Disclosed herein are a method and a system for recognizing a space of a road shoulder using an ultrasonic wave sensor, a radar and an imaging device. The method includes: controlling the radar to transmit a radar beam within a preset range based on the vehicle location, detecting a fixed object located within the preset range using a reflective wave of the radar beam received by the radar, calculating a distance between the fixed object and the vehicle using the radar when the fixed object is located within the preset range, detecting a solid line lane marking in a front image of a travel lane obtained from the imaging device, and recognizing the calculated distance between the fixed object and the vehicle as a space width of the road shoulder when the solid line lane is in the front image of the travel lane. [A1137]

"Radar aided doppler compensation"

A radar system includes an antenna. The radar system comprises a processor for providing an error in ground speed estimate based upon Doppler velocity data, and a transmitter. The frequency of radar signals from the transmitter is adjusted according to a velocity of the aircraft calculated using the error in ground speed estimate or using the error in ground speed estimate. The adjusted frequency can allow ground clutter to be removed by high pass filtering in one embodiment. [A1138]

"System for and method of wind shear detection"

A radar system includes an antenna. The radar system comprises a transmitter coupled to the antenna. The transmitter provides a radar signal. The radar signal includes a first set of pulses having a high bandwidth and a second set of pulses having a lower bandwidth. In one embodiment, the radar system is used for wind shear detection and the antenna is a smaller antenna. [A1139]

"Method for positioning and vehicle communication unit"

Methods and an appropriately setup communication unit for positioning in vehicle-to-surroundings communication are described, wherein the method involves a first sensor (S1) of a first communication subscriber using a transmission and reception unit to emit a challenge pulse, to which a transmission and reception unit of a second sensor (S2) of a second communication subscriber responds with a response pulse. The response pulse is received and evaluated by the first sensor (S1) and positioning is performed. In order to achieve reliable cooperative sensor communication, the transmission and reception units of the first and second sensors (S1, S2) use a frequency band (SCH2) which is reserved for vehicle-oriented safety applications. [A1140]

"RF gun barrel detection system"

A method of detecting an object includes receiving first reflected radio frequency (RF) signals from a region using an antenna and generating a first backscattering signature of the region from the first reflected RF signals. The method further includes receiving second reflected RF signals from the region subsequent to receiving the first reflected RF signals and generating at least one second backscattering signature of the region from the second reflected RF signals. The method further includes detecting a difference between the first backscattering signature and the second backscattering signature, and providing a warning indication in response to the difference between the first backscattering signature and the second backscattering signature. [A1141]

"Method and apparatus for detecting vehicle wheels"

Method for detecting wheels of a vehicle that is traveling on a roadway in a travel direction and the wheels of which are at least partially exposed laterally. The method including: emitting an electromagnetic measurement beam lobe with a known temporal progression of frequency from the side of the roadway onto an area of the roadway and at a slant with respect to the travel direction, receiving the measurement beam lobe reflected by a passing vehicle and recording the temporal progression, relative to the known progression, of all of its frequencies, and during the passage of a vehicle, detecting a frequency spread appearing in the recorded progression and exceeding a predetermined spread magnitude, as a wheel. [A1142]

"Pseudo real time receive signal sampling for ground penetrating radar"

A system and method for pseudo real time collection of receive signal data in a single- or multi-channel ground penetrating radar. Each channel transmits electromagnetic impulses into a medium under test during each of a plurality of runs over the medium. Run receive signals are received in response to the transmitted impulses. Each run receive signal is sampled multiple times at a run sample rate. The sample points of each run are delayed by delay sequences with respect to the sample points of the other runs. The sample points of the individual runs are stored as a composite set of sample points representative of a receive signal sampled at an effective sample rate equal to a multiple of the run sample rate where the multiple is the number of runs. [A1143]

"Subterranean radar system and method"

A subterranean radar array system and method for imaging a subterranean target area. In one example, the subterranean radar array includes a plurality of radar chains disposed in a plurality of underground columns, each radar chain including a plurality of radar units forming the plurality of radar chains and at least one processor coupled to a corresponding at least one of the plurality of radar chains and configured to generate an image of a subterranean target area from signals received from the at least one radar chain. [A1144]

"Systems and methods for mapping the crust of the earth"

A system comprises a radar transmitter configured to generate a radar signal at a predetermined frequency and a radar receiver configured to receive a reflected signal produced by a reflection of the radar signal. The system further includes a radar antenna system configured to transmit the radar signal into a subterranean region and to receive the reflected signal from the subterranean region. A control system is used for controlling a dwell time of the radar antenna system, and a processor is adapted to generate an image of at least a portion of the subterranean region based at least in part on the reflected signal. [A1145]

"Object sensing device"

An object sensing device has a radiation part that radiates an exploring wave forward, a sensing part having a first sensing element and a second sensing element, wherein the first sensing element and the second sensing element sense a reflected wave of the exploring wave radiated by the radiation part, and a determination part. The determination part determines a rainfall state ahead based on an intensity of the reflected wave sensed by the first sensing element. The determination part determines existence or non-existence of an object positioned forward based on an intensity of the reflected wave sensed by the second sensing element. A visual-field restricting member is disposed in front of the first sensing element. The visual-field restricting member causes a visual field, in which the first sensing element senses the reflected wave, to differ from a visual field, in which the second sensing element senses the reflected wave. [A1146]

"Intruding object discrimination apparatus for discriminating intruding object based on multiple-dimensional feature"

A normalization processing circuit normalizes a position of a complex demodulation signal on a complex plane from an A/D converter, and outputs a normalized complex demodulation signal after the normalization to a multiple-dimensional feature extractor. The multiple-dimensional feature extractor calculates a feature quantity that changes when a person intrudes, a feature quantity that changes in wind and rain, and a feature quantity that changes when a spatially isolated intense electric field exists. A discriminator discriminates that a person has intruded based on the feature quantities of three dimensions. [A1147]

"Projection detecting apparatus and projection detecting method"

A projection detecting apparatus according to the present invention is that for detecting a projection on a surface of a running metal object, and includes a transmission antenna for radiating electromagnetic waves, a reception antenna for receiving reflected electromagnetic waves, and a transmission and reception signal processing section for processing a transmission signal and a reception signal. The transmission antenna and the reception antenna have unidirectionality and the transmission antenna and the reception antenna are installed in such a way that the reception antenna does not catch electromagnetic waves which have been radiated by the transmission antenna and reflected on the surface of the metal object and the reception antenna catches electromagnetic waves alone which have been radiated by the transmission antenna and reflected on the projection. [A1148]

"Reactor pressure vessel head vents and methods of using the same"

Internal head vents are usable in nuclear reactors and include piping inside of the reactor pressure vessel with a vent in the reactor upper head. Piping extends downward from the upper head and passes outside of the reactor to permit the gas to escape or be forcibly vented outside of the reactor without external piping on the upper head. The piping may include upper and lowers section that removably mate where the upper head joins to the reactor pressure vessel. The removable mating may include a compressible bellows and corresponding funnel. The piping is fabricated of nuclear-reactor-safe materials, including carbon steel, stainless steel, and/or a Ni--Cr--Fe alloy. Methods install an internal head vent in a nuclear reactor by securing piping to an internal surface of an upper head of the nuclear reactor and/or securing piping to an internal surface of a reactor pressure vessel. [A1149]

"Intermittent surface measurement"

A method of determining a filling level of a product contained in a tank, the method comprising the steps of: a) transmitting an electromagnetic probing signal towards a target area of a surface of the product, b) receiving a reflected probing signal being a reflection of the electromagnetic probing signal at the surface, c) determining a parameter value indicative of an amplitude of the reflected probing signal, if the parameter value is indicative of an amplitude larger than a predetermined threshold value: d) transmitting an electromagnetic measuring signal towards the target area of the surface, e) receiving a return signal being a reflection of the electromagnetic measuring signal at the surface, and f) determining the filling level based on a time relation between the electromagnetic measuring signal and the return signal. [A1150]

"Guided wave radar level gauge system with dielectric constant compensation through multi-mode propagation"

A guided wave radar level gauge system, comprising a transmission line probe configured to support a first propagation mode such that it travels along the transmission line probe with a first propagation velocity exhibiting a first dependence on a dielectric constant of the surrounding medium, and support a second propagation mode such that it travels along the transmission line probe with a second propagation velocity exhibiting a second dependence, different from the first dependence, on the dielectric constant of the surrounding medium. The guided wave radar level gauge system further comprises processing circuitry connected to the transceiver for determining the filling level based on the reflected electromagnetic signal in the first propagation mode and the second propagation mode, and a known relation between the first dependence and the second dependence on the dielectric constant of the surrounding medium. Hereby, a filling level determination that is independent of the dielectric constant of the medium surrounding the transmission line probe can be achieved. [A1151]

"Fill level measuring device working with microwaves"

A fill level measuring device includes: a transmitting and receiving system for producing a higher frequency microwave signal and a lower frequency microwave signal. The transmitting and receiving system includes a single antenna, which has an internally funnel shaped horn and two hollow conductor segments connected with one another and connected to the horn. The antenna additionally includes, a coaxial conductor connection, via which the antenna is fed with the lower frequency microwave signal and the associated lower frequency echo signal is received. The antenna additionally includes, connected to a horn-remote end of that one of the two hollow conductor segments arranged on an end of the hollow conductor segment adjoining the horn, a hollow conductor connection, via which the antenna is fed with the higher frequency microwave signal and the associated higher frequency echo signal is received. [A1152]

"Vehicle-mounted radar device"

Provided is a vehicle-mounted radar device capable of obtaining a high azimuth resolution with a simple configuration. The vehicle-mounted radar device is mounted on a vehicle, and includes: a detector for irradiating a periphery of the vehicle with electromagnetic waves, and for outputting a reception signal obtained from reflected waves that are reflected from an object that exists in the periphery of the vehicle, a vehicle information calculator for calculating information related to a movement of the vehicle with a use of vehicle information of the vehicle, a storage unit for storing a plurality of the reception signals outputted by the detector at different time points, and a synthetic aperture processor for conducting a synthetic aperture processing on the reception signals obtained by the vehicle at different positions, based on the information related to the movement of the vehicle. [A1153]

"Methods and apparatus for sensing organic tissue"

In exemplary implementations of this invention, a radio signal is transmitted between a transmitter and a receiver. Either the transmitter, or receiver, or both, have a directional antenna. When organic tissue passes between (or is stationary between) the transmitter and receiver, the tissue causes a reduction of the received signal strength (RSS) of the signal, as compared to a baseline RSS. The larger the amount of tissue, the greater is the reduction of the RSS. By analyzing the degradation of the signal, information about organic tissue between the transmitter and receiver may be determined. for example, the number of persons passing through a physical threshold may be determined. Or the fact that one person is walking faster than, and catching up with, a second person as they pass between the transmitter and receiver may be determined. [A1154]

"Tracking target objects orbiting earth using satellite-based telescopes"

A system for tracking objects that are in earth orbit via a constellation or network of satellites having imaging devices is provided. An object tracking system includes a ground controller and, for each satellite in the constellation, an onboard controller. The ground controller receives ephemeris information for a target object and directs that ephemeris information be transmitted to the satellites. Each onboard controller receives ephemeris information for a target object, collects images of the target object based on the expected location of the target object at an expected time, identifies actual locations of the target object from the collected images, and identifies a next expected location at a next expected time based on the identified actual locations of the target object. The onboard controller processes the collected image to identify the actual location of the target object and transmits the actual location information to the ground controller. [A1155]

"Radar system"

A radar system comprising a transmitter to transmit radar signals into a region, a receiver to receive return signals of said radar signals reflected from within the region wherein the transmitter and receiver are adapted for location on a structure at a wind farm, and a processor to process the return signals to extract wind farm associated data for said region. [A1156]

"Conformal array, luneburg lens antenna system"

A Luneburg lens is used in conjunction with a patch antenna array. The patch antenna array is conformed or adapted to cover a portion or backside of the Luneburg len's surface with the backplane of the conformed antenna array defining a field of regard (FOR) in which objects are detected and tracked. A processor is connected to a receiver/exciter module which connects to transmit/receive modules which are connected to the individual patch antennas through a network of MEMS switches. In a receive mode, selected subarrays of the conformed patch antenna array are scanned during selected time intervals with the sum and delta beams being formed coherently in amplitude and phase to realize amplitude monopulse sensing and angle tracking of an object. [A1157]

"Ground moving target indicating radar"

An airborne moving target indicating (MTI) radar includes an array antenna. A receive processor electronically multiplies the signals received by each antenna element by element enable/disable signals which vary from time to time, thus electronically moving the effective phase center of the antenna array. The motion of the phase center is matched to the moving vehicle speed and direction. [A1158]

"Ultra-wideband short-pulse radar with range accuracy for short range detection"

An ultra-wideband (UWB) radar transmitter apparatus comprises a pulse generator configured to produce from a sinusoidal input signal a pulsed output signal having a series of baseband pulses with a first pulse repetition frequency (PRF) . The pulse generator includes a plurality of components that each have a nonlinear electrical reactance. A signal converter is coupled to the pulse generator and configured to convert the pulsed output signal into a pulsed radar transmit signal having a series of radar transmit pulses with a second PRF that is less than the first PRF. [A1159]

"Object identification device and method"

Provided is an object identification device and a method for the same that are capable of identifying a three-dimensional object and a road surface static object, irrespective of situations. The object identification device identifies an object, based on a transmission signal and a reflection signal caused by the object reflecting the transmission signal. The object identification device includes: a measurement section configured to measure at least one of the relative distance and the relative velocity with respect to the object, an intensity detection section configured to detect the intensity of the reflection signal, and an object identification section configured to identify the object which can be an obstacle object, based on at least one of the relative velocity and the variation in the relative distance, and on the variation in the intensity. [A1160]

"Off-diagonal element echo power estimator for polarization weather radar"

Embodiments of the invention are directed to improving the sensitivity in polarimetric radar data. In particular, embodiments of the invention improve the sensitivity of such systems with improved post processing techniques. The sensitivity can be improved by using the co-polar elements (off diagonal elements) of the covariance matrix in power and/or reflectivity determinations. This can not only improve the sensitivity but may also enhance identification and improve quantitative estimates of precipitation. [A1161]

"Metal detector and ground-penetrating radar hybrid head and manufacturing method thereof"

A hybrid ground penetrating radar (GPR) /metal detector (MD) head includes a V-dipole GPR antenna and transmit and receive MD coils. One of the MD coils is arranged in a quadrupole configuration with a crossbar, and the V-dipole antenna is perpendicular to the crossbar. The legs of the V-dipole antenna may straddle the crossbar or may be on one side of the crossbar. The MD coils may be fabricated on a printed circuit board, which may be at a non-normal angle with respect to a central axis of the V-dipole antenna. [A1162]

"Pulse signal generation device"

To provide a microwave/milliwave band high-frequency pulse signal generating device that enables realization of structural simplification, high performance, compact integration, easy design, low power consumption, and low cost. A radiation type oscillator substrate S1 having an inner-layer GND 12 interposed between a front-side dielectric substrate 10 and a rear-side dielectric substrate 11 is provided on the radiation surface side with a pair of axially symmetrical patches 4, 4, a gate electrode 2 and drain electrode 3 of a microwave transistor 1 are respectively connected to the conductor patches 4, 4, DC bias is supplied to the gate electrode 2 through an RF choke circuit 5a, a monopulse from a monopulse generation circuit 7 is supplied to the drain electrode 3 through an RF choke circuit 5b, an impedance line 9 satisfying an oscillating condition is connected to a source electrode 8, and a high-frequency pulse signal of an oscillation frequency/frequency bandwidth determined by negative resistance produced by short-duration operation of the microwave transistor 1 and the resonant cavity structure is generated and simultaneously radiated into space. [A1163]

"FMCW radar sensor for motor vehicles"

An FMCW radar sensor for motor vehicles, having a high frequency part for generating, transmitting and receiving radar signals, a modulation device for controlling the frequency modulation of the transmitted radar signal, at least one analog preprocessing stage for an intermediate frequency signal formed from the received radar signal, at least one analog/digital transducer stage, and a processor for controlling the modulation device and for further processing the digital signals of the analog/digital transducer stage, wherein the modulation device, the preprocessing stage and the analog/digital transducer stage are integrated into a single semiconductor component, which also has a monitoring device and registers for the configuration and monitoring of the components of the semiconductor component as well as an interface to the processor. [A1164]

"Guided wave radar level gauge with improved sealing arrangement"

A radar level gauge for determining a filling level of a product contained in a tank. The gauge has a sealing arrangement comprising a hollow housing, a conductor and a dielectric sleeve arranged inside the housing and surrounding the conductor. At least one gap is formed between the dielectric sleeve and an adjacent, electrically conducting surface, the gap having a first end which is open to an interior of the tank, so that in use, tank atmosphere may enter and condensate in the gap. The sealing arrangement further comprises an electrically conducting coating provided on a surface of the dielectric sleeve facing the gap, and in electrical contact with said adjacent, electrically conducting surface, so that an impedance between the electrically conducting coating and the adjacent electrically conducting surface is sufficiently low at an operating frequency of the gauge to reduce an influence of any medium present in the gap. [A1165]

"Bicycle detector"

A vehicle detector capable of detecting motorized vehicles, bicycles only or both types of vehicle in a loop near a controlled intersection. The vehicle detector includes a processor under control of machine readable code for controlling the operation of one or more oscillators coupled to one or more loops. Manually actuatable switches enable the entry of mode settings--i.e., motorized vehicle and bicycle detect or bicycle only detect--and clearance time parameters for ensuring that one or more bicycles can safely proceed through an intersection when given a green light. Selection of the Bicycle detect mode is denoted by the entry of a non-zero value in an initial timer using one or more of the switches. [A1166]

"Submillimeter radar using phase information"

A signal processor (30) for a submillimeter wavelength active radar system (10, 20, 30) processes signals received and downconverted by the radar system, the downconverted signals corresponding to a given pixel of the field of view having time varying amplitude and phase components which have a periodic component which is dependent on content. Information about the content is discriminated from the periodic component. By using phase rather than only amplitude, there is additional information in the downconverted signals. The phase is more sensitive to changes in the content such as objects, background and atmospheric conditions, than amplitude alone. The phase information enables the periodic component to be retained which can be characteristic of the content owing to content flutter, changes in submillimeter standing waves and interference fringes in received reflections of submillimeter illumination if surface layers have a thickness of a number of half wavelengths. [A1167]

"Method for detecting precipitation using a radar sensor system for motor vehicles"

A method for detecting precipitation using a radar sensor system for motor vehicles designed for locating objects in the surroundings of the vehicle, in which method a locating signal that is a measure of the received power density as a function of the distance is integrated across a specific distance range lying below a limit distance for detecting precipitation. The locating signal is subjected to a filtering procedure before being integrated, the filtering procedure suppressing the peaks caused by located objects so that the filtered signal forms a measure of the noise level as a function of the distance. [A1168]

"Systems and methods for extending maritime domain awareness by sharing radar tracks between vessels"

A system for extending maritime domain awareness of participating vessels. The system includes a domain extension device installed on each of the vessels, the domain extension devices including at least one processor configured to receive own-ship radar track data from a navigational radar indicative of detectable targets located within a detection range of the radar, receive own-ship location values from a positioning device indicative of a geographical location of the vessel when the radar track data is generated, interface with a transceiver to receive other-ship radar track data and associated other-ship location values from one or more other participating vessels within a communication range of other-ship AIS transceivers, generate a common operating picture based upon the own-ship radar track data, own-ship location value, other-ship radar track data and other-ship location values. [A1169]

"Method, device and program for setting threshold, and method, device and program for detecting target object"

This disclosure provides a method of setting a threshold according to a level of an echo signal containing an unused component. The echo signal is generated by transmitting and receiving a radio wave with an antenna while the antenna revolves. The method includes acquiring levels of the echo signals at every predetermined distance interval and updating a threshold set for an observing position based on the level of the echo signal at the observing position, the threshold set for the observing position, and a threshold set for a position closer to the antenna than the observing position by the predetermined distance on the same sweep. [A1170]

"Multiple-sensor tracking processing method with reduced latency time"

A multiple-sensor tracking method, notably implemented in an air traffic control system, making it possible to reduce the latency time introduced by the tracking system, characterized in that the correlation (302) and association (303) functions work on the basis of membership of the detections (502) and of the tracks (503, 504) to cells (510, 511) defining a subdivision into a grid (501) of the surveillance area represented on a stereographic projection plane. [A1171]

"Mobile object detecting apparatus"

A mobile object detecting apparatus includes first radiation detecting means, and second radiation detecting means for radiating an electromagnetic wave having the same frequency as the electromagnetic wave radiated by the first radiation detecting means such that the radiated electromagnetic wave passes near a point in the first radiation detecting means from which the electromagnetic wave is radiated, and detecting a standing wave which is generated due to reflection of the radiated electromagnetic wave at an object, wherein a distance, over which the electromagnetic wave radiated by the first radiation detecting means travels until it reaches near the first radiation detecting means, corresponds to a distance of an integral multiple of a wave length of a half cycle of the electromagnetic waves radiated by the radiation detecting means plus a wave length of a predetermined period which is smaller than the half cycle. [A1172]

"Radar sensor having two oscillators, two I/Q transmit mixers, and two I/Q receive mixers"

A radar sensor for motor vehicles, having a transmitting part, which has two oscillators and a 90.degree. phase shifter for generating a transmission signal, a first comparison signal, and a second comparison signal, which is phase shifted by 90.degree. with respect to the first comparison signal, and a receiving part having an I mixer for mixing a received signal with the first comparison signal and a Q mixer for mixing the received signal with the second comparison signal, in which the transmitting part has a first transmit mixer, whose inputs are directly connected to the two oscillators, and a second transmit mixer, whose one input is directly connected to a first of the two oscillators and whose other input is connected via the phase shifter to the other oscillator. [A1173]

"Driving assist apparatus"

A driving assist apparatus for a vehicle is disclosed. The driving assist apparatus includes a transmitter for transmitting a transmission wave, a receiver for receiving a reflected wave, an obstacle presence determination section for detecting a presence of an obstacle in the surrounding of the vehicle based on the reflected wave, a measurement section for measuring a frequency of phase delay and advance of the reflected wave with respect to a reference signal, and a detection section for detecting the obstacle having a specific relation with the vehicle based on the presence of the obstacle determined by the obstacle presence determination section and the frequency of delay and the frequency of advance measured by the measurement section. [A1174]

"Object recognition device and object recognition method"

Provided is an object recognition device and an object recognition method that can estimate the size of an object detected by a radar, through a simple configuration. The object recognition device includes: a detection section for radiating an electromagnetic wave to an object in a forward direction of the vehicle and for detecting the object by receiving a reflected wave reflected by the object, a target information calculation section for calculating information containing a moving direction of the detected object as target information, by using a signal received by the detection section, a vehicle information calculation section for calculating information containing a moving direction of the vehicle as vehicle information, by using information obtained from the vehicle, and a processing section for estimating, based on the information indicating the moving direction of the object contained in the target information and the information indicating the moving direction of the vehicle contained in the vehicle information, from which portion of the object detected by the detection section the electromagnetic wave was reflected, and for calculating a presence area in which the object is present relative to the vehicle, in accordance with a result of the estimation. [A1175]

"Calibration to improve weather radar positioning determination"

A method of calibrating antenna-position detection associated with a radar system, the radar system including a first gimbal and a first angle sensor configured to detect an angular position of the first gimbal, includes mounting a second angle sensor to the first gimbal configured to detect an angular position of the first gimbal. The first gimbal is rotated through each angular position of a set of the angular positions. A first set of data is generated with the first angle sensor that characterizes a detected angular position of the first gimbal. A second set of data is generated with the second angle sensor that characterizes a detected angular position of the first gimbal. A third data set is determined comprising differences, between the first and second data sets, in detected angular position at each first-gimbal angular position. The third data set is stored in a memory device. [A1176]

"Method for estimating the angular position of a target by radar detection and radar implementing said method"

A method of estimating the angular position .theta..sub.c of a target detected by a radar equipping a mobile carrier and emitting, via an steerable antenna, a signal, in the form of pulses, towards the target and receiving echoes from the reflection of said signal on the target, comprises: estimating, for each pulse or group of pulses of time index i, the angular position .theta. (i) of the antenna, estimating, for each pulse or group of pulses of time index i, the Doppler frequency f.sub.D (i) of the echo or echoes received, pairing, for each pulse or group of pulses of time index i, the angular position .theta. (i) and the Doppler frequency f.sub.D (i) , and, estimating the angular position .theta..sub.c at least by solving the equation .lamda..times..times..function..times..times..times..theta..function..times..theta..theta..function. ##EQU00001## where .lamda. is the wavelength of the radar, V.sub.a is the norm of the speed of the carrier and V.sub.r,c is the radial speed of the target. [A1177]

"Method and apparatus for recognizing presence of objects"

An object recognition apparatus is provided, which enhances accuracy in recognizing more than one object to be detected closely located along a scan direction. In the apparatus, measured-distance datums included in an area formed by those measured-distance datums which are spaced apart by a distance of not more than a predetermined allowable value are grouped as one candidate area. The candidate area, if it has a size larger than a specified value, is regarded as a special candidate area. An object area on an image datum corresponding to the special candidate area is subjected to an image recognition process to define the range of the objects residing therein. The special candidate area is divided at a border between the objects based on the defined range. All candidate areas including the divided new candidate areas are subjected to a tracing process to confirm an object in each candidate area. [A1178]

"Millimeter wave radar-equipped headlamp"

A millimeter wave radar-equipped headlamp includes a millimeter wave radar that detects an object ahead of a vehicle, and a lighting device unit that irradiates an area ahead of the vehicle. The lighting device unit incorporates an antenna module of the millimeter wave radar. The lighting device unit includes a projection lens, a light source, a reflector, and a shade. The antenna module includes a millimeter wave waveguide, and a millimeter wave reflection mirror. A reflection surface of the millimeter wave reflection mirror is formed by a spheroidal surface having a first focal point located in the vicinity of the opening of the millimeter wave waveguide, and a second focal point located forward of the rear focal point. [A1179]

"Method for detecting icing at an angle-resolving radar sensor in a driver assistance system for motor vehicles"

A method for detecting icing at an angle-resolving radar sensor in a driver assistance system for motor vehicles, in which signals of a plurality of antenna elements each having a specific angle characteristic are compared with the corresponding angle characteristics, and the azimuth angle of a located object is determined on the basis of an angle fit quality which indicates how well the signals of the antenna elements correspond to the angle characteristics for a given azimuth angle, wherein an indicator for icing is formed which is a monotonically falling function of the angle fit qualities of the located objects, with objects having a low signal-to-noise ratio being included in the indicator at the most with a reduced weighting. [A1180]

"Method for detecting wind power plants using a radar system"

A method for detection of wind power installations using a radar installation is provided. The method involves transmitting a number N of predetermined sequences of modulated transmission pulses at a predetermined pulse repetition frequency successively in time and receiving and processing transmission pulses reflected by an object to determine whether the object is a wind power installation. [A1181]

"Air-to-ground antenna"

A directional antenna is disclosed. The directional antenna may include a support structure for defining a support surface, a first antenna stack positioned on the support surface, the first antenna stack having multiple antenna elements oriented in a first orientation, allowing the first antenna stack to concentrate radiations in a first direction, a second antenna stack positioned on the support surface, the second antenna stack having multiple antenna elements oriented in a second orientation, the second orientation being rotated a predetermined angle with respect to the first orientation, allowing the second antenna stack to concentrate radiations in a second direction different from the first direction, and a controller configured to selectively activate at least one of the first antenna stack or the second antenna stack to steer the radiations of the directional antenna in different directions without physical/mechanical movement of the antenna stacks. [A1182]

"Mobile coherent change detection ground penetrating radar"

Described are a method and system for detecting and locating changes in an underground region. Changes are detected using a mobile coherent change detection ground penetrating radar (GPR) . The GPR system is located on a mobile platform that makes two more measurement passes over the same route to acquire GPR images of an underground region at different times. A lateral offset between the GPR images for the two different times is determined and applied to one of the GPR images to generate a GPR shifted image that is spatially aligned with the other GPR image using a correlation process or other technique. A GPR difference image is generated from the GPR shifted image and the other GPR image. The GPR difference image includes data representative of changes to the underground region that occurred between the two measurement passes. [A1183]

"Methods and systems for filtering traffic information for display"

A method and a system for displaying an airport or runway moving map with traffic information on a display screen in the cockpit or flight deck of an aircraft. Symbology representing surface and near-surface aircraft and surface vehicle traffic and associated traffic data are filtered to prevent or limit clutter on the display screen. Traffic symbology is automatically and manually filtered to display only relevant traffic. Traffic data is selectively displayed and displayed as/when relevant or needed. The displayed traffic information may be derived from automatic dependent surveillance-broadcast, traffic information system-broadcast, automatic dependent surveillance-rebroadcast, traffic collision avoidance system or other source. [A1184]

"Return pulse shape analysis for falling edge object discrimination of aerosol LIDAR"

A LIDAR optical remote sensing system and method analyzes the falling edge profile of a return LIDAR signal that may be indicative of an object or an aerosol cloud, which is generally more diffuse. Using the falling edge profile permits burnthrough to an object that may be obscured by the aerosol cloud. The profile is compared against at least one threshold that may correspond, in various embodiments, to a negative slope of the falling edge, an integrated power under the falling edge, or a range estimate error for varying transmitted power values, varying transmitted pulse lengths and/or varying receiver detector field of view values. [A1185]

"Sensor cart positioning system and method"

A movable platform has a front end, a back end, a longitudinal axis, and at least one axle oriented generally transverse to the longitudinal axis and located between the front and back ends for supporting wheels of the platform. A position sensor is affixed on the platform at a location other than at a location defined by a plane passing through the axle and normal to the longitudinal axis. The position sensor provides position data as the platform traverses a path. A sensor arrangement is supported by the platform and configured to provide subsurface sensor data as the platform traverses the path. A processor is configured to associate the position data with the sensor data relative to a reference frame and in a manner that accounts for dynamic motion of the platform. [A1186]

"System and method for actively determining obstacles"

An exemplary embodiment relates to an aircraft system for detecting wires. The system includes a processor configured to actively sense a presence of a first object and a second object. The processor determines a location of the first object and the second object. The processor determines a potential location of a wire between the first object and the second object. The processor actively senses the wire by providing electromagnetic energy to the potential location. [A1187]

"Accident prevention system and a vehicle including the accident prevention system"

A vehicle with an accident prevention system is disclosed. The vehicle also has a foot brake for stopping the vehicle. The system includes a sensor arrangement for sensing an object behind a rear end of the vehicle that generates an object recognition signal when it senses an object within range behind the vehicle. The sensor arrangement includes passive IR sensors or reflected pulse sensors such as sonar or radar sensors on the rear end. A controller generates an accident prevention response signal on receiving an object recognition signal from the sensor arrangement. A brake applicator is operatively coupled to the brake to stop the vehicle when the controller generates a response signal. Conveniently the system includes an alarm for sounding an alarm signal. A method for preventing an accident where a vehicle which is reversing at low speed collides with a person is also disclosed. [A1188]

"Object detection with a multistatic array using singular value decomposition"

A method and system for detecting the presence of subsurface objects within a medium is provided. In some embodiments, the detection system operates in a multistatic mode to collect radar return signals generated by an array of transceiver antenna pairs that is positioned across a surface and that travels down the surface. The detection system converts the return signals from a time domain to a frequency domain, resulting in frequency return signals. The detection system then performs a singular value decomposition for each frequency to identify singular values for each frequency. The detection system then detects the presence of a subsurface object based on a comparison of the identified singular values to expected singular values when no subsurface object is present. [A1189]

"Process for generating spatially continuous wind profiles from wind profiler measurements"

A neural network process for improving wind retrievals from wind profiler measurements is described. In this invention, a neural network is trained to retrieve (missing or incomplete) upper level winds from ground based wind profiler measurements. Radiosonde measurements in conjunction with wind profiler ground measurements for specific geographical locations are used as training sets for the neural network. The idea is to retrieve timely and spatially continuous upper level wind information from (fragmented or incomplete) wind profiler measurements. [A1190]

"Circuit board, high frequency module, and radar apparatus"

A circuit board is provided. The circuit board includes a substrate, a waveguide line and a laminated waveguide. The waveguide line is at least partially positioned on a first surface of the substrate. The waveguide line transmits a high frequency signal. The laminated waveguide is formed inside the substrate. The laminated waveguide is electromagnetically coupled to the waveguide line, and has a lead-out portion led out from inside the substrate to a surface other than the first surface. The laminated waveguide includes a dielectric layer, a pair of main conductive layers and a through conductor group. The pair of main conductive layers sandwiches the dielectric layer in a thickness direction thereof. In the through conductor group, a plurality of through conductors are arranged along a high frequency signal transmitting direction. The plurality of through conductors electrically connect the pair of main conductive layers. [A1191]

"Radar device"

Provided is a radar device capable of preventing mispairing from occurring, and obtaining a distance to a target and a relative velocity to the target even if at least one of the peak frequencies of beat signals cannot be extracted and pairs of the peak frequencies cannot be generated. A target estimation part (20) estimates a distance (RN) to a target (21, 22) and a relative velocity (VN) to the target (21, 22) based on a distance (RO) to the target (21, 22) and a relative velocity (VO) to the target (21, 22) , which have been decided by a target decision part (13) in a previous cycle, when at least one of the peak frequencies of the beat signal cannot be extracted and the pair of the peak frequencies cannot be generated. [A1192]

"Determining root correspondence between previously and newly detected objects"

A system that applies attribute and topology based change detection to networks of objects that were detected on previous scans of a structure, roadway, or area of interest. The attributes capture properties or characteristics of the previously detected objects, such as location, time of detection, size, elongation, orientation, etc. The topology of the network of previously detected objects is maintained in a constellation database that stores attributes of previously detected objects and implicitly captures the geometrical structure of the network. A change detection system detects change by comparing the attributes and topology of new objects detected on the latest scan to the constellation database of previously detected objects. [A1193]

"Reflectivity maps"

Systems and methods for embedding three-dimensional targets in realistic sonar images are provided. An actual or synthetic sonar image is first created and a reflectivity map is produced therefrom. A direct path bottom reverberation is calculated to which texture is added by multiplying the signal from a given point on the bottom at coordinates (x,y) by the reflectivity map R (x,y) at that point and in which targets are embedded. Echoes from targets and other noise sources are superimposed on the direct path bottom reverberation to generate raw unbeamformed stave data. The stave data is beamformed to produce the desired complex image with the desired targets naturally embedded therein. [A1194]

"Method of detecting a vehicle speed and related electronic device"

A method of detecting a vehicle speed is disclosed in the present invention. The method includes outputting a detecting wave, receiving a reflecting wave from an external object when the external object passes through a covering range of the detecting wave, calculating a variation between the detecting wave and the reflecting wave, and reading a table for executing an application program according to information of the table. [A1195]

"Collision avoidance apparatus"

A collision avoidance apparatus capable of executing an appropriate vehicle control in order to avoid a collision between an own vehicle and a movable object is provided. A collision avoidance apparatus for avoiding a collision between an own vehicle and a movable object includes: a laterally-existing movable object detector for detecting for a movable object that approaches from a direction lateral to the own vehicle, a side collision determination section for determining whether or not a risk that the own vehicle and the movable object collide with each other is high, when the laterally-existing movable object detector has detected the movable object that approaches from the direction lateral to the own vehicle, a passage and avoidance determination section for determining, when the risk that the own vehicle and the movable object collide with each other is determined to be high, whether or not a possibility that a collision between the own vehicle and the movable object can be avoided by the own vehicle passing in front of the movable object, is high, and an accelerated state/decelerated state controller for controlling the own vehicle to be in one of an accelerated state and a decelerated state, according to a determination result of the passage and avoidance determination section. [A1196]

"Super-angular and range-resolution with phased array antenna and multifrequency dither"

An electromagnetic transmitter arrangement includes an antenna line array or subarray defining at least first and second ends, and including first, second, third, fourth, and fifth antenna elements, arranged with the first antenna element at the first end, the fifth element at the second end, the third element at the center, the second element between the first and third elements, and the fourth element between the third and fifth elements. Multiple (N) corresponding radio frequency sources are provided, each source communicating with a respective antenna element along a given radio-frequency signal path extending from the given signal source to the given antenna element, and where a first signal source generates signals at frequency f0, and each of the N-1 additional sources generate signals at frequencies of f0.+-. (N-1) .DELTA.f, where N is an integer greater than or equal to 5. [A1197]

"Vehicle radar system"

There are provided an object distinguishing unit that distinguishes an object every predetermined calculation cycle, and a state determination unit that determines a relative state between the object distinguished by the object distinguishing unit and a vehicle and that performs switching control in which based on the result of the determination, there is performed switching from one of a first angle detection unit and a second angle detection unit to the other in the next calculation cycle, and the value of an incident angle is inputted to the object distinguishing unit. [A1198]

"Weather detection using satellite communication signals"

Disclosed is a satellite weather detection system that uses atmospheric precipitation density data. Subscribers detect the signal strength and signal-to-noise ratio of signals that are transmitted from the satellite. Upstream transmit power data is also collected, which is needed to achieve a given SNR at a gateway. The values of the downstream signal strength and signal-to-noise ratio data as well as the upstream transmit power data are normalized and compared with current atmospheric data. The data can be color coded and graphically displayed to show weather patterns. Location and velocity of high precipitation density cells can be tracked to predict movement of storms. [A1199]

"Dual mode ground penetrating radar (GPR)"

A dual mode ground penetrating radar includes an enclosure which houses radar electronics. The dual mode ground penetrating radar includes an enclosure housing radar electronics. The dual mode ground penetrating radar further includes a first antenna feed having ferrite loading and extending outside of the enclosure. The dual mode ground penetrating radar further includes a second antenna feed spaced apart from the first antenna feed, the second antenna feed having ferrite loading and extending outside of the enclosure. An RF signal is provided in at least one of the first and second antenna feeds by the radar electronics. [A1200]

"Method for remote identification and characterization of hydrocarbon source rocks using seismic and electromagnetic geophysical data"

Method for assessing hydrocarbon source rock potential of a subsurface region without well log information. The method uses surface electromagnetic (121) and seismic (122) survey data to obtain vertical profiles of resistivity and velocity (123) , which are then analyzed in the same way as well log data are analyzed by the well known Delta Log R method (124) . [A1201]

"Vehicle control apparatus, vehicle, and vehicle control method"

A perceived relative distance that shows a relative distance between a host vehicle and a perception object perceived by a driver of the host vehicle is calculated on the basis of an actual relative distance therebetween. A perceived relative velocity that shows a relative velocity between the host vehicle and the perception object perceived by the driver is calculated on the basis of an actual relative velocity therebetween. A perceived relative ratio that is a ratio between the perceived relative distance and the perceived relative velocity is calculated. If the perceived relative ratio exceeds a threshold value, a vehicle control is performed. [A1202]

"Dual mode ground penetrating radar (GPR)"

A dual mode ground penetrating radar includes an enclosure which houses radar electronics. The dual mode ground penetrating radar includes a enclosure housing radar electronics. The dual mode ground penetrating radar further includes a first antenna feed having ferrite loading and extending outside of the enclosure. The dual mode ground penetrating radar further includes a second antenna feed spaced apart from the first antenna feed, the second antenna feed having ferrite loading and extending outside of the enclosure. An RF signal is provided in at least one of the first and second antenna feeds by the radar electronics. [A1203]

"Random body movement cancellation for non-contact vital sign detection"

A method and system for cancelling body movement effect for non-contact vital sign detection is described. The method begins with sending on a first electromagnetic wave transceiver a first electromagnetic signal with a first frequency to a first side of a body, such as a person or animal. Simultaneously using a second electromagnetic wave transceiver a second electromagnetic signal is sent with a second frequency to a second side of a body, wherein the first frequency and the second frequency are different frequencies. A first reflected electromagnetic signal reflected back in response to the first electromagnetic wave on the first transceiver is received and a first baseband complex signal is extracted. Likewise a second reflected electromagnetic signal reflected back in response to the second electromagnetic wave on the second transceiver is received and a second baseband complex signal is extracted. The first baseband complex signal is mathematically combined with the second baseband complex signal to cancel out a Doppler frequency drift therebetween to yield a periodic Doppler phase effect. [A1204]

"Object detection device for vehicle and object detection method for vehicle"

An object detection device for a vehicle includes a transmission and reception unit that transmits an electromagnetic wave and receives a reflected wave, a reflecting point computation unit that computes a position of a reflecting point of the electromagnetic wave on the object, a distance computation unit that computes a distance from the subject vehicle to the object, an end point detection unit that detects at least one of an end point on the right side of the object and an end point on the left side thereof, a shielding determination unit that determines whether the end point of the object is shielded by another object when viewed from the subject vehicle, and an end point movement speed computation unit that computes a lateral movement speed of the end point of the object determined as not being shielded. [A1205]

"Classification of subsurface objects using singular values derived from signal frames"

The classification system represents a detected object with a feature vector derived from the return signals acquired by an array of N transceivers operating in multistatic mode. The classification system generates the feature vector by transforming the real-valued return signals into complex-valued spectra, using, for example, a Fast Fourier Transform. The classification system then generates a feature vector of singular values for each user-designated spectral sub-band by applying a singular value decomposition (SVD) to the N.times.N square complex-valued matrix formed from sub-band samples associated with all possible transmitter-receiver pairs. The resulting feature vector of singular values may be transformed into a feature vector of singular value likelihoods and then subjected to a multi-category linear or neural network classifier for object classification. [A1206]

"Systems and methods for tracking mobile terrestrial terminals for satellite communications"

System and methods provide tracking capabilities by one or a plurality of satellites for a mobile terrestrial terminal. A user requests that a satellite track a particular mobile terrestrial terminal. If the user privilege level allows for this level of control, the satellite adjusts to track the identified terminal. One method for tracking involves the use of a steerable antenna in which the antenna steers to maintain a footprint over the identified mobile terminal. Another method for tracking involves moving the satellite itself to maintain a footprint over the identified mobile terminal. The tracking functionality may utilize a closed loop tracking method. [A1207]

"Apparatus and sensor for adjusting vertical sensor-alignment"

Disclosed are a sensor, the vertical alignment of which can be adjusted, and a vertical sensor-alignment adjustment apparatus using the same. In particular, in order to allow the vertical alignment to be adjusted, the sensor has a construction including a plurality of switchable transmitting antennas or a plurality of switchable receiving antennas or a construction including a tilting motor for adjusting an transmitting angle or a receiving angle. The vertical sensor-alignment adjustment apparatus employing such a sensor determines whether the sensor is misaligned in terms of its vertical alignment, and corrects the vertical misalignment of the sensor by executing variable switching to one of the transmitting antennas, by executing variable switching to one of the receiving antennas, or by controlling the tilting motor, so that the transmitting angle of sensor signals or the receiving angle of reflected waves for the sensor signals can be adjusted. [A1208]

"Motor vehicle radar system, and method for determining speeds and distances of objects"

Presented is a method for determining speeds (vr14, vr16) and distances (r14, r16) of objects (14, 16) relative to a radar system (12) of a motor vehicle (10) , wherein a coverage area (EB) of the radar system (12) is divided into at least two part-areas (TB1, TB2, TB3) , the coverage area (EB) is examined for reflecting objects (14, 16) in successive measuring cycles (MZ1, MZ2, MZi, MZi+1) , wherein radar signals received in a measuring cycle (MZ1, MZ2, MZi, MZi+1) are processed separated in accordance with part-areas (TB1, TB2, TB3) and processed signals are assembled to form a total result differentiated in accordance with spatial directions. The method is characterized in that from signals received in a first measuring cycle (MZ1, MZi) , hypotheses for the distance (r14, r16) and speed (vr14, vr16) of reflecting objects (14, 16) are formed and the hypotheses are validated in dependence on signals received in at least one further measuring cycle (MZ2, MZi+2) . Furthermore, a radar system (12) is presented which carries out such a method. [A1209]

"Radiometric imaging device and corresponding method"

Radiometric imaging for scanning a scene includes a radiometer for detecting radiation emitted in a predetermined spectral range from a spot of the scene and for generating a radiation signal from the detected radiation. Spot movement circuitry effects a movement of the spot, from which the radiation is detected, to various positions. Control circuitry controls the spot movement circuit to effect the movement of the spot from one position to another position so that radiation is detected at a number of spots distributed over the scene. The number is lower than the number of pattern signals of the high-density signal pattern and the radiation signals generated from the radiation detected at the number of spots form a low-density signal pattern. Processing circuitry processes the radiation signals of the low-density signal pattern and generates the high-density signal pattern by applying compressive sensing to the low-density signal pattern. [A1210]

"Sensor device for measuring the compression travel and/or the compression rate of wheels and/or axles of vehicles"

A sensor device for measuring the compression travel and/or the compression rate of wheels and/or axles of vehicles, in particular of commercial vehicles, may include at least one sensor measuring in a contactless manner. The sensor device may include a radar and/or high-frequency sensor generating a beam, which is emitted and received after reflection at a reference and reflection surface. [A1211]

"Locating device"

The invention relates to a locating device, in particular a hand-guided locating device, with a locating unit (36) for detecting the presence of an object (16, 18) arranged in an examination object (14) by means of an examination signal (38) , which has a polarization unit (50) provided for a procedure with the examination signal (38) , and with a housing (20) for taking up the locating unit (36) , which has a longitudinal axis (24) . It is proposed that in at least one operating mode the polarization unit (50) specifies at least one first polarization plane (52, 54) aligned obliquely to the longitudinal axis (24) . [A1212]

"Optical-flow techniques for improved terminal homing and control"

In certain aspects, this invention is a "control system" that detects and minimizes (or otherwise optimizes) an angle between vehicle centerline (or other reference axis) and vehicle velocity vector--as for JDAM penetration. Preferably detection is exclusively by optical flow (which herein encompasses sonic and other imaging) , without data influence by navigation. In other aspects, the invention is a "guidance system", with optical-flow subsystem to detect an angle between the vehicle velocity vector and line of sight to a destination--either a desired or an undesired destination. Here, vehicle trajectory is adjusted in response to detected angle, for optimum angle, e.g. to either home in on a desired destination or avoid an undesired destination (or rendezvous) , and follow a path that's ideal for the particular mission--preferably by controlling an autopilot or applying information from navigation. Purposes include real-time angle optimization to improve autopilots or guidance, and vehicle development or testing. [A1213]

"Distributed road assessment system"

A system that detects damage on or below the surface of a paved structure or pavement is provided. A distributed road assessment system includes road assessment pods and a road assessment server. Each road assessment pod includes a ground-penetrating radar antenna array and a detection system that detects road damage from the return signals as the vehicle on which the pod is mounted travels down a road. Each road assessment pod transmits to the road assessment server occurrence information describing each occurrence of road damage that is newly detected on a current scan of a road. The road assessment server maintains a road damage database of occurrence information describing the previously detected occurrences of road damage. After the road assessment server receives occurrence information for newly detected occurrences of road damage for a portion of a road, the road assessment server determines which newly detected occurrences correspond to which previously detected occurrences of road damage. [A1214]

"Method for determining a road profile of a lane located in front of a vehicle"

A method for determining a road profile of a lane located in front of a vehicle via sensed image data (1) and/or sensed inherent vehicle movement data (2) . An estimating device (3) is provided, to which the sensed image data (1) and/or the sensed inherent vehicle movement data (2) are supplied. A road elevation profile (P) of the lane located in front of the vehicle is determined via the sensed image data (1) and/or the sensed inherent vehicle movement data (2) . [A1215]

"Vehicle surrounding monitor device and method for monitoring surroundings used for vehicle"

A vehicle surrounding monitor device 10 includes a front area millimeter-wave radar 11 to a left dead angle millimeter-wave radar 18 which monitor different areas around a host vehicle 100, a vehicle speed sensor 21 and the like which detect the traveling state of the host vehicle 100, a winker signal sensor 31 which detect the state of a driver, and an obstacle detection method determination ECU 41 which controls the operation of the front area millimeter-wave radar 11 and the like and information processing. The obstacle detection method determination ECU 41 sets priority on the front area millimeter-wave radar 11 and the like on the basis of the traveling state of the host vehicle 100 and the state of the driver detected by the vehicle speed sensor 21, the winker signal sensor 31, and the like, and controls the operation of the front area millimeter-wave radar 11 and the like and the information processing on the basis of the priority. Therefore, control differs between a radar having high priority and a radar having low priority, such that, even when a plurality of radars are used, it becomes possible to monitor the surroundings the host vehicle 100 while reducing the load of a CPU or an in-vehicle LAN. [A1216]

"Method and system for aiding environmental characterization by ultra-wideband radiofrequency signals"

The invention relates to environmental characterization on the basis of an Ultra Wide Band (UWB) radiofrequency communication network. Pulses are emitted and the waveform received is compared with predicted waveforms corresponding to well determined interactions between the wave and its environment. The comparison is done by searching for maximum temporal correlation. The interactions can be notably reflections of the wave on walls or obstacles. The deformations are very dependent on the nature of the materials and directions in which the pulses are emitted and received. If predicted waveforms are stored for various pairs of direction of emission and of reception, it is possible through these correlation operations to find where a wall which gave rise to a reflection is situated. [A1217]

"Dual-polarization radar processing system using time domain method"

Embodiments of the present invention provide for improved estimation of environmental parameters in a dual-polarization radar system. In some embodiments, environmental parameters can be estimated using a linear combination of data received in two orthogonal polarization states. In particular, embodiments of the invention improve ground clutter and noise mitigation in dual polarization radar systems. Moreover, embodiments of the invention also provide for systems to determine the differential reflectivity and/or the magnitude of the co-polar correlation coefficient and the differential phase in a dual polarization radar system. [A1218]

"Method and system for reducing light pollution"

A system for preventing light pollution includes one or more radar units that monitor for vehicles in a volume surrounding or containing one or more obstructions having one or more obstruction lights. A master radar detection processing unit receives sensed radar detection information from the one or more radar units with associated radar signal processing units and determines whether a vehicle is present within the monitored volume. A plurality of obstruction light controller units are interconnected in a network, such as a wireless network. Each obstruction light controller unit turns on an obstruction light when a vehicle enters the monitored volume or a failure condition exists, and turns off the obstruction light when the vehicle has vacated the monitored volume and no failure condition exists. The one or more radar units can transmit sensed radar detection information to a master radar detection processing unit via the network. [A1219]

"Radar system with improved angle formation"

A radar system for recording the environment of a motor vehicle includes at least two transmitter antennas for emitting transmission signals, one or more receiver antennas for receiving transmission signals that have been reflected by objects, and signal processing equipment for processing the received signals. The antennas are arranged so that a phase center of at least one receiver antenna, with regard to a spatial direction R, does not lie outside of phase centers of two transmitter antennas that are offset in this spatial direction. The signals received by this receiver antenna are separated according to the two signal portions respectively originating from these two transmitter antennas. [A1220]

"Rotational parabolic antenna with various feed configurations"

A rotational antenna includes a stationary feed which is disposed in a substantially vertical orientation. A parabolic dish is rotationally mounted about the stationary feed in a state of being tipped with respect to the stationary, substantially vertically oriented feed. The rotational parabolic antenna may alternatively be provided with a rotating radio frequency (RF) and acoustic feed. Other embodiments are disclosed. [A1221]

"Access to locked functions"

A mobile communications device can have a locked mode in which the mobile communications device is protected against unauthorized use. A mobile communications device includes device applications implemented by a software program or firmware program that enables an application to be temporarily operable or operable under certain conditions when the mobile communications device is locked. Device applications can include a camera enabled for image data acquisition and a microphone or an audio recorder or a microphone and an audio recorder enabled for audio data acquisition. Acquired image data and audio data can be stored locally to the mobile communications device or stored externally to the mobile communications device. The mobile communications device can be configured to operate applications under different conditions. The mobile communications device can be configured to display a message that applications have been operated while the mobile communications device was locked or in a locked mode. [A1222]

"Base station device and distance measuring method"

Provided are a distance measuring device and a distance measuring method which can easily distinguish a reflected signal from a desired tag from an unnecessary wave so as to improve the distance measuring accuracy even when IR-UWB is used for measuring a distance. The method uses a reader ID indicated by a code string formed by P bits (P is a natural number) for identifying a base station and a tag ID indicated by a code string formed by Q bits (Q is a natural number) for identifying a radio terminal. The method generates a unique word containing P pulses, each of which is ON/OFF-modulated depending on whether each of P bits indicating the reader ID is 1 or 0. The method generates a frame containing 2 M unique words and a burst containing Q frames. The method further outputs a transmission signal containing a plurality of bursts. A radio terminal Amplitude Shift Keying (ASK) --modulates the transmission signal depending on whether each of the Q bits indicating the tag ID is 1 or 0. The ASK-modulated signal is sampling-received at timings of different phases by 1/M (M is an integer not smaller than 1) of the transmission clock cycle. [A1223]

"Apparatus for estimating the height at which a target flies over a reflective surface"

An apparatus for estimating a height at which a target flies over a reflective surface. The apparatus includes means for emitting a signal, and means for receiving signals, including the emitted signal after it has been echoed by the target. The apparatus also includes a height estimator configured to estimate the height by utilizing a direct signal coming directly from the target after the emitted signal has been echoed by the target, an indirect signal coming indirectly from the target after the emitted signal has been echoed by the target and has been reflected by the surface, and reflection parameters including at least one of an amplitude of a reflection coefficient of the surface and a phase difference between the direct signal and the indirect signal. The height estimator comprises a particle filter configured to dynamically estimate the reflection parameters. [A1224]

"Reducing false alarms in identifying whether a candidate image is from an object class"

In one aspect, a method to reduce false alarms in identifying whether a candidate image is from an object class includes projecting the candidate image onto an object class subspace and projecting the candidate image onto a non-object class subspace. The method also includes determining whether the candidate image is from the object class using a Bayesian decision function based on the projections on the object class subspace and the non-object class subspace. In another aspect, a method to reduce false alarms in identifying whether a candidate mine image is from a mine class includes projecting the candidate mine image onto a mine subspace and projecting the candidate mine image onto a non-mine subspace. The method also includes determining whether the candidate mine image represents a mine using a Bayesian decision function based on the projections on the mine class subspace and the non-mine class subspace. [A1225]

"Low-power wireless network beacon for turning off and on fluorescent lamps"

A low-power wireless network involves a plurality of RF-enabled fluorescent lamp starter units. In each of a plurality of intervals, a receiver of a starter unit operates in a receive mode during a beacon slot time, and for the majority of the rest of the interval operates in a low-power sleep mode. The starter unit wakes up and listens for a beacon each beacon slot time, regardless of whether a beacon is transmitted during that interval or not. A starter unit can be commanded to schedule a future action (for example, for a time between widely spaced synchronizing beacons) by making one of the beacons a scheduling beacon. The scheduling beacon includes a field that the starter unit uses to schedule the future action. If the scheduled action is to be canceled before the next widely spaced synchronizing beacon, then an action-canceling beacon is communicated in the next interval. [A1226]

"Object detection apparatus"

An object detection apparatus including: an electromagnetic wave radiating-receiver radiating an electromagnetic wave and receiving a reflection wave of the radiated electromagnetic wave, a reflection point identifying mechanism identifying, based on data regarding the reflection wave received by the electromagnetic wave radiating-receiver, a reflection point on a detection target object at which the radiated electromagnetic wave was reflected, and a representative point setting mechanism setting a representative point representing the position of the detection target object based on the reflection point identified by the reflection point identifying mechanism. The object detection apparatus outputs data regarding the set representative point. The representative point setting mechanism performs a correction prohibiting or minimizing a change of position of the representative point in the detection target object which occurs as a result of a change in a relative position between the detection target object and the moving body. [A1227]

"Advance manufacturing monitoring and diagnostic tool"

The current invention relates to a monitoring and analysis device and a method for monitoring and analysis that utilizes the unintended electromagnetic emissions of electrically powered systems. The present invention monitors electrical devices by taking detailed measurements of the electromagnetic fields emitted by any component or system utilizing electricity. The measurements will be analyzed to both record a baseline score for future measurements and to be used in detailed analysis to determine the status of the analyzed system or component. [A1228]

"Near field electromagnetic location system and method"

A system and method for determining a position of a locus comprising a locator device for disposition at the locus, the locator device configured for receiving an electromagnetic signal from a beacon device, the locator device receiving at a distance from the beacon device within near field range of the electromagnetic signal, the locator device configured for distinguishing at least two characteristics of the electromagnetic signal sensed at the locus, the system employing the at least two characteristics to effect the determining of the position of the locus. [A1229]

"Radio frequency positioning system for vehicles"

A positioning system for radio frequency devices includes a two-way radio antenna, for vehicles, having a transmitting and a receiving element. Reference antennas have retro-directive arrays which can shape the signal beams in elevation, polarize transmission and reception signals according to a circular or a linear polarization, the polarized transmission retro-directively reflecting signals having the same polarization as the incident ones in the case of circular polarization, or retro-directively reflecting signals having orthogonal polarization in the case of linear polarization. An encoder is included for transmitting an identification code of the reference antenna. A controller processes the spatial and temporal data resulting from communication through the radio waves transmitted and received by the vehicle antennas and reflected by the reference antennas. The controller calculates the distance of the vehicle from the reference antennas that have reflected the signal transmitted by the antennas. [A1230]

"Thin film emitter-absorber apparatus and methods"

Methods and apparatus for providing a tunable absorption-emission band in a wavelength selective device are disclosed. A device for selectively absorbing incident electromagnetic radiation includes an electrically conductive surface layer including an arrangement of multiple surface elements. The surface layer is disposed at a nonzero height above a continuous electrically conductive layer. An electrically isolating intermediate layer defines a first surface that is in communication with the electrically conductive surface layer. The continuous electrically conductive backing layer is provided in communication with a second surface of the electrically isolating intermediate layer. When combined with an infrared source, the wavelength selective device emits infrared radiation in at least one narrow band determined by a resonance of the device. In some embodiments, the device includes a control feature that allows the resonance to be selectively modified. The device has broad applications including gas detection devices and infrared imaging. [A1231]

"Signal processing device, radar device, vehicle control system, signal processing method, and computer-readable medium"

A signal processing device performs object detection processing in which peak signals each representing a differential frequency between a transmitted signal in which a frequency thereof changes in a predetermined cycle and a received signal are derived in a first period where the frequency of the transmitted signal rises and a second period where the frequency of the transmitted signal falls, and the peak signals in the first period are paired with the peak signals in the second period to detect object information related to the peak signals. A range setting unit sets a frequency range in each of the first period and the second period on the basis of a frequency of an integer multiple of the peak signal related to the object information which has been detected in previous object detection processing. A signal setting unit sets a peak signal as a specific peak signal in a case where the peak signal is within the frequency range in each of the first period and the second period. A paring unit pairs the specific peak signal in the first period and the specific peak signal in the second period. [A1232]

"Radar device, object detection system, and object detection method"

A vehicle mounted radar device operable to scan a transmission wave to detect a detection point representing a position of an object disposed around the vehicle on the basis of a reflected wave of the transmission wave from the object. The radar device includes a reading unit, a continuity determination unit, a setting unit, anti an object determination unit that are configured to prevent the radar device from erroneously determining different pieces of object information as a single object. [A1233]

"Distance control system of vehicle"

A distance control system of a vehicle includes: a signal transmitter for transmitting wireless signals forward with respect to a distance-controlled vehicle, a signal receiver for receiving the wireless signals reflected and returned from an object vehicle, a relative velocity measuring unit for measuring the relative velocity of the object vehicle in relation to the distance-controlled vehicle on the basis of the received wireless signals, a vehicle-to-vehicle distance measuring unit for measuring a first vehicle-to-vehicle distance between the distance-controlled vehicle and the object vehicle, and a vehicle-to-vehicle distance calculating unit for calculating a third vehicle-to-vehicle distance based on the first vehicle-to-vehicle distance and a second vehicle-to-vehicle distance calculated from the relative velocity. [A1234]

"Surface penetrating radar system and target zone investigation methodology"

A radar system (22) includes a transmitter (45) , a receiver (59) , and a software defined radio (SDR) peripheral (40) . Methodology (80) for investigating a target zone (26) utilizing the system (22) entails generating (106) a direct sequence spread spectrum (DSSS) code (120) having a code length (122) corresponding to a time duration of radio wave travel between the transmitter (45) , the target zone (26) , and the receiver (59) at a carrier frequency (112) . A beacon signal (34) , modulated (108) by the DSSS code (120) , is transmitted (152) from the transmitter (45) toward the target zone (26) and a return signal (38) is received (156) at the receiver (56) . The return signal (38) is compared (170) to a replica signal (168) characterized by the DSSS code (120) , and presence of an object (32) in the target zone (26) is ascertained (178) when the return signal (38) matches the replica signal (168) . [A1235]

"Method and system of locating objects"

The invention concerns a method and system of locating objects by means of UWB signals, the system including a search device (D1) , incorporated in a portable apparatus (11) and provided with a pair of antennae (A1, A2) , and at least one target device (D2) attached to an object sought (12) . The target device (D2) includes, in addition to the transceiver (34, 35) , a very low power consumption wake up receiver (46) which, when the target device is in a standby state, can receive a UWB wake up signal to switch on said device. This target device is arranged for measuring a time difference (tdiff) between the respective receptions of two locating signals respectively emitted by the two antennae (A1, A2) of the search device and for transmitting said time difference in a return signal that further contains, in a preferred variant, a signal processing time (trproc) . Thus, it is not necessary for the two devices to be synchronized. Preferably, the search device (D1) is incorporated in a wristwatch (11) the two hands (51, 52) of which are used for indicating the direction or possible directions of the object sought (12) . [A1236]

"Weather radar beam-sharpening and de-quantization"

Systems and methods for improving display quality for at range weather data of smaller antenna size radar weather systems. A processor receives a column of quantized reflectivity data associated with an antenna from a radar system. The processor adjusts the column of quantized reflectivity data based on estimated quantized reflectivity data associated with a beam pattern for an antenna that is larger than the antenna associated with the received column of quantized reflectivity data. [A1237]

"Forward facing sensing system for vehicle"

A forward facing sensing system for a vehicle includes a radar sensor device disposed within the vehicle cabin and having a sensing direction forward of the vehicle, and an image sensor disposed within the vehicle cabin and having a viewing direction forward of the vehicle. A control includes an image processor that is operable to analyze images captured by the image sensor in order to, at least in part, detect an object forward of the vehicle. The control, at least in part, determines that a potentially hazardous condition may exist in the path of the vehicle, with the potentially hazardous condition including at least one of (i) another vehicle, (ii) a person and (iii) an animal in the path of the vehicle. The radar sensor device and the image sensor collaborate to enhance the sensing capability of the sensing system for the potentially hazardous condition in the vehicle's path. [A1238]

"Cable identification using data traffic activity information"

A cable identification system is provided. The cable identification system includes a cable having a plurality of conductors with an electrical connector on at least one end of the cable. The electrical connector is adapted to connect all conductors in the cable to a mating connector. The cable identification system further includes a signal generator connectable between the electrical connector and the mating connector on a network device. The signal generator includes a controller configured to measure and analyze parameters indicative of data traffic in the cable. The cable identification system further includes a cable sleeve adapted to receive the cable therein and coupled to the electrical connector. The cable sleeve has one or more segments which are electrically activatable to change an appearance based on a signal sent by the electrical connector in response to the measurements of the parameters indicative of traffic in the cable. [A1239]

"System and method for providing driving safety"

A safe driving providing system for supporting a safe driving of a vehicle includes: a radar for transmitting a signal of a predetermined frequency bandwidth to a plurality of vehicles, analyzing signals provided by the vehicles, calculating location information and distance information of the vehicles, and finding inter-vehicle distance information of the vehicles based on the location information and the distance information, and a controller for receiving operation speed information from a vehicle information terminal device installed in each vehicle, determining driving safety of the plurality of vehicles based on the received operation speed information and inter-vehicle distance information provided by the radar, and transmitting a warning message for safe driving to the vehicle information terminal device. [A1240]

"Correction of radar beam refraction using electro-optical measurements"

A method determines the atmospheric refraction of a radar beam by utilizing a stabilized optical telescope directed toward a star near the radar target location. This allows measuring the target refraction as observed from ships at sea without a-priori knowledge of the local refraction index or weather conditions in the target area. The telescope may employ an infra-red (IR) sensor and is capable of imaging stars. The atmospheric refraction of the star light is determined by pointing the telescope based on star ephemeris data, and measuring the star image deviation from the center of the telescope's field-of-view (FOV) . The corresponding refraction of the radar beam can be determined by employing a conversion factor relating the IR-to-RF atmospheric propagation characteristics. This conversion factor can be obtained by dedicated tracking measurements. [A1241]

"Dual-polarization weather radar data system and method"

The present invention essentially comprises a system, method, computer program and combinations thereof to utilize dual-polarization generated date generally associated with weather events for mapping data, producing geo-referenced data, producing mosaics, generation of conditional precipitation masks, production of vertical cross sections and predetermined fly throughs, producing short term forecasting, prediction of specific weather phenomenon, correcting or adjusting rain gauge data as well as quantitative precipitation estimation, and combining other meteorological data to correct or adjust estimated rainfall accumulation gathered by dual-polarization radar. [A1242]

"Driving assistance apparatus"

A driving assistance apparatus is configured such that, in a case in which determination has been made there is a road marking within a predetermined range from a vehicle, the road marking is detected based upon an image acquired by a rear-side camera. In a case in which there is a single control target solely associated with the road marking thus detected, or in a case in which there are multiple control targets associated with the road marking, and the difference in the marking-target distance is equal to or greater than a driving control threshold distance, the target-vehicle distance, which is the distance between the vehicle and the control target that is a target for guidance and vehicle control, is calculated. The driving assistance apparatus performs guidance and vehicle control according to the control target based upon the target-vehicle distance thus calculated. [A1243]

"Object detection with multiple frequency chirps"

A system and method are disclosed for the generation and processing of waveforms utilized to modulate the carrier frequency of a microwave sensor employed, to determine the range and velocity of an object of interest. The system and method result in improved performance in environments with high levels of interference. [A1244]

"On-vehicle road configuration identifying device"

A road configuration identifying device properly identifies the road configuration around a user's vehicle. A reliability level indicating whether the traveling paths of other vehicles in an area behind the user's vehicle which are detected by a radar positioning system, which are obtained by tracking other vehicles using an other vehicle tracking section, and the traveling path of the user's vehicle are traveling paths along the same road configuration is calculated by using the velocity v, acceleration dv, angular velocity d.theta., and the operation state of a direction indicator or the like of each vehicle. Then, the road configuration indicated by traveling paths having a high reliability level is predicted as the road configuration in the area behind the user's vehicle. A warning device evaluates the possibility of other vehicles colliding with the user's vehicle based on the road configuration of the area behind the user's vehicle predicted by the road configuration predicting section and the behavior of other vehicles tracked by the other vehicle tracking section, and warns of the possibility of collision if such another vehicle is present. [A1245]

"Control apparatus, radar detection system, and radar detection method"

In a control apparatus, an acquisition unit acquires the coordinates of a detection starting position and detection ending position detected by a radar, for each of a plurality of moving vehicles moving along a road. A calculation unit calculates an average value of the coordinates of the detection starting positions and an average value of the coordinates of the detection ending positions, and stores information of radar detection including the calculated average values in a radar detection storage unit. A comparison unit compares the average values of the coordinates of the detection starting positions and detection ending positions with respective determined reference values. An abnormality determination unit determines based on the comparison results whether or not an abnormality has occurred in the radar, and outputs, if determining that an abnormality has occurred, information indicative of the occurrence of the abnormality. [A1246]

"RF ranging-assisted local motion sensing"

Example methods, apparatuses, and articles of manufacture are disclosed herein that may be utilized to facilitate or otherwise support RF ranging-assisted local motion sensing based, at least in part, on measuring one or more characteristics of a range between communicating devices in one or more established RF links. [A1247]

"Multichannel, multimode, multifunction L-band radio transceiver"

Systems and methods for providing an improved multiradio system. An exemplary system includes first and second antennas and a first receiver that receives a signal from the first antenna, filters the received signal based on bandwidths associated with a traffic collision-avoidance system (TCAS) , a transponder, and a universal access transceiver (UAT) . The system digitizes the filtered signal and digitally downconverts the digitized signal. A second receiver receives a signal from the second antenna, filters the signal received from the second antenna based on the TCAS, the transponder, the UAT, and distance-measuring equipment (DME) , separates the filtered signal into a first signal having a bandwidth associated with the TCAS, the transponder, the UAT and the lower half of the DME RF band, and into a second signal having a bandwidth associated with the upper half of the DME RF band, digitizes the first and second signal, and digitally downconverts the digitized first and second signals. [A1248]

"System for detecting persons in a defined space"

System (10) for detecting the position of a mobile or immobile entity (20) in a defined space (30) , characterized in that it includes: means (40) of detecting the presence of said entity in at least two partially overlapping observation areas (Z1, Z2) of said space, said means being adapted for collecting at least one piece of immobile presence information (Ip) and one piece of movement information (Im) of said entity in each of said observation areas, processing means (50) which are adapted for carrying out logic operations on at least a portion of said information collected for each of said observation areas, decision means (60) , which are connected to the processing means and adapted for controlling an action on the basis of a logic signal generated by the processing means. [A1249]

"System and method for roll angle indication and measurement in flying objects"

A method for onboard determination of a roll angle of a projectile. The method including: transmitting a polarized RF signal from a reference source, with a predetermined polarization plane, receiving the signal at a pair of polarized RF sensor cavities positioned symmetrical on the projectile with respect to a reference roll position on the projectile, measuring a difference between an output of the pair of polarized RF sensor cavities resulting from the received signal to determine zero output roll positions of the projectile, and comparing an output of the pair of polarized RF sensor cavities at each of the zero output positions to determine when the projectile is parallel to the predetermined polarization plane. The method can also include analyzing an output of at least one third sensor positioned on the projectile to determine whether the roll angle position of the projectile is up as compared to the horizon. [A1250]

"Method and apparatus for determining locations of a moving radar"

A method for determining locations of a moving emitter is disclosed. Initially, a set of emitter pulses is collected when a collector platform moves over a collection baseline. In addition, the time and location of the collection platform are recorded each time an emitter pulse is collected. A set of time-tagged pulse time-of-arrival (TOA) values is then generated by associating a recorded collection time value to each of the collected emitter pulses.

Next, a set of time-tagged and position-tagged pulse TOA values is generated by associating a recorded collection location value to each of the time-tagged pulse TOA values. Finally, a set of location values and velocity values of a moving emitter is estimated based on the time-tagged and position-tagged pulse TOA values. [A1251]

"Method for detecting precipitation using a radar locating device for motor vehicles"

A method for detecting precipitation using a radar locating device for motor vehicles, that is designed to locate objects in the surroundings of the vehicle, in which method a locating signal (42) , which is an index for the received power density as a function of the distance (R) , is integrated over a first distance range (INT1) , which is below a limit distance (R.sub.lim) for the detection of precipitation, wherein the locating signal (42) is additionally integrated over a second distance range (INT2) , which is above limit distance (R.sub.lim) , and for the detection of precipitation, the integrals over the first and second distance range are compared with each other. [A1252]

"Method, apparatus, and system to remotely acquire information from volumes in a snowpack"

A method, apparatus, and system to remotely acquire information from volumes in a snowpack and to analyze the information are disclosed. Electromagnetic energy is transmitted remotely to a region of interest in a snowpack and data about reflections are processed to determine reflection values for different volumes within the snowpack. The frequency of the transmit signal is modulated and the positions from which energy is transmitted and received are changed to create a two-dimensional synthetic aperture that allows reflections from three-dimensional volumes to be discriminated and resolved. The electromagnetic energy is transmitted to ensure that it arrives at the snowpack at shallow grazing angles to maximize returns from volumes in the snow and to minimize boundary reflections from the ground. [A1253]

"Vehicle length sensors"

A vehicle length sensor for a vehicle such as a variable length truck, the sensor being provided with a mount for mounting the sensor on a vehicle and being arranged with a detection circuit arranged to measure, in use, a length of a vehicle to which the sensor is mounted. Typically, the detection circuit comprises a transmitter circuit, which is arranged to transmit radiation along the length of the vehicle, and a receiver circuit that is arranged to receive radiation that was transmitted by the transmitter circuit and reflected from the vehicle, and in which the detection circuit is arranged to determine from the reflected radiation the length of the vehicle. The sensor may also act as a lane change assistant, comparing the range of other vehicles to the length of the vehicle to which it is mounted. [A1254]

"Location of a transponder center point"

In a radio location system for vehicles moving along a guideway, a transmitter for energizes a transponder beside the guideway. A first detector for detects a response signal from the energized transponder to determine the transponder identification. A second detector detects a positional signal received from the transponder that is decoupled from the first signal and contains precise positional information. In one embodiment, the second detector picks up a crossover signal from a crossover antenna. [A1255]

"Determination of the gap size of a radial gap"

A method for determining the size of a radial gap between rotating and torsion-proof parts, particularly the parts of a turbomachine is provided. According to the method, an original signal emitted by a transmitter device located on the surface of the rotating part is received in a modified manner by a receiver device disposed on the torsion-proof part and is redirected to an evaluation unit. The evaluation device determines and displays the size of the radial gap from the received signal by determining the parameters of the trajectory of the rotating transmitter device. [A1256]

"Method for optimizing the operation of an active lateral-view sensor when the height above the surface to be detected is variable"

A process for optimizing the operation of an active lateral-view sensor when the height above the surface to be detected is variable, includes the following steps: i) continuously determining the height of the lateral-view sensor above the surface to be detected, and ii) adjusting the scanning beams emitted by the lateral-view sensor for scanning the surface to be detected by roll rotation as a function of the determined height of the lateral-view sensor such that variation of the surface to be detected is reduced during the orbit of the lateral-view sensor. [A1257]

"Method, technique, and system for detecting Brillouin precursors at microwave frequencies for enhanced performance in various applications"

A method, system, and software for using Brillouin precursors to enhance UWB, RF, and Microwave Remote Sensing systems by providing greater penetration depths and or resolution. Embodiments also include methods, software, and systems which provide a method to detect the formation of Brillouin precursor waveforms in any given dispersive media, for any transmitted signal and any frequency range. [A1258]

"Method for fill level measurement"

A method for a fill level measurement in which a first and/or a second fill substance can be located. A rest position can be ascertained, when the entire amount of each fill substance in the container forms a single layer containing only this fill substance, wherein the first fill substance has a smaller specific weight than the second fill substance, and the two fill substances have different dielectric constants. An electromagnetic signal is sent into the container, wherein a part of the signal is reflected. A capacitance between a capacitive probe and a reference electrode is measured, dependent on the amounts of the fill substances located in the container, and, on the basis of the measured capacitance and the measured travel times for each fill substance present in the container, the rest position of its fill substance upper surface is ascertained. [A1259]

"Method and program for setting threshold, and method, program and device for detecting target object"

This disclosure provides a method of setting a threshold according to a level of an echo signal of an unused component. The echo signals are generated by transmitting and receiving a radio wave with an antenna while the antenna revolves. The method of setting the threshold includes calculating a difference value between a level of the echo signal at an observing position and a level of the echo signal at a position comparatively on the antenna side and close to the observing position, selecting a process for setting a threshold from either one of a first threshold setting process and a second threshold setting process according to the difference value, and updating the threshold for the observing position by using the selected threshold setting processing. [A1260]

"Driving support apparatus for vehicle"

Provided is a driving support apparatus for a vehicle. When a stop signal is recognized by a stereo image recognition device, a cruise control unit calculates a traffic signal target acceleration for making a subject vehicle stop at a stop position of the stop signal. When a follow-up cruise target acceleration is not calculated and the traffic signal target acceleration is calculated, the cruise control unit substitutes the traffic signal target acceleration for the follow-up cruise target acceleration. When the follow-up cruise target acceleration and the traffic signal target acceleration are calculated and the traffic signal target acceleration is smaller than the follow-up cruise target acceleration, the cruise control unit substitutes the value of the traffic signal target acceleration for the follow-up cruise target acceleration. [A1261]

"Method of detecting an object in a scene comprising artifacts"

A method for detecting an object in a scene situated in a sector and capable of comprising one or more artifacts, includes_a step of scanning the sector at an angular velocity .theta.', a step of acquiring digital images of the scene at a rate f by means of a matrix detector, these images comprising pixels and covering an instantaneous field of angular width "a". It comprises the following steps of processing the acquired images, in batches of N consecutive images where N=af/.theta.': dividing the N images into P groups of images, for each group p, accumulating the images of the group so as to obtain an accumulated image I.sub.p, for each image I.sub.p, selecting the pixels that satisfy a determined detection criterion, for each image I.sub.p comprising at least one selected pixel, called the start-of-confirmation image, carrying out a temporal confirmation step which comprises the following substeps: applying a temporal confirmation criterion by comparing with a number K the number k of times that this selected pixel in the starting image has been selected in the subsequent I.sub.p images: this pixel will be considered to be that of an object if k.gtoreq.K, reiterating this temporal confirmation criterion for all the selected pixels of this starting image. [A1262]

"Three dimensional radar antenna method and apparatus"

A ground based avian radar receive antenna is implemented using a vertically oriented offset parabolic cylindrical antenna. The desired azimuth beamwidth is determined by the width of the parabolic cylinder reflector surface and the desired elevation beamwidth by the height of the parabolic cylinder reflector surface. A vertical array of antenna elements is mounted along the vertical focal line to provide electronic scanning in elevation. Low sidelobe levels are obtained using tapered antenna element illumination. Low cost modular construction with high reflector accuracy is obtained by attaching a thin metal reflector to thin ribs machined or stamped in the shape of the parabolic cylinder reflector surface. The antenna is enclosed in a radome and mechanically rotated 360 degrees in azimuth. [A1263]

"Device for determining a relative speed between a vehicle and an impact object"

A device is proposed for determining a relative speed between a vehicle and a crash object, the device being situated in the vehicle itself. The device has one active surround field sensor system and one contact sensor system. The device ascertains the relative speed with the aid of a first signal, the surround field sensor system and with the aid of a second signal of the contact sensor system. [A1264]

"Method of analyzing the surroundings of a vehicle"

A method of analyzing the surroundings of a vehicle, comprising the steps of: gathering data regarding objects in the vicinity of the vehicle, analyzing the data to determine regions of empty space around the vehicle, creating one or more signatures representing at least some of the regions of empty space, and storing the signatures for later retrieval. [A1265]

"Correlation position determination"

Methods and apparatus for navigating with the use of correlation within a select area are provided. One method includes, storing data required to reconstruct ranges and associated angles to objects along with statistical accuracy information while initially traversing throughout the select area. Measuring then current ranges and associated angles to the objects during a subsequent traversal throughout the select area. Correlating the then current ranges and associated angles to the objects to reconstructed ranges and associated angles to the objects from the stored data. Determining at least one of then current location and heading estimates within the select area based at least in part on the correlation and using the least one of the then current location and heading estimates for navigation. [A1266]

"In-vehicle pulse radar"

There is provided an in-vehicle pulse radar that permits to detect information on an object accurately by temporally separating a noise signal mixed into a receiving signal by applying a delay time with a simple configuration. A baseband signal down-converted by a frequency converter (152) is output to a signal processing section (102) through a board-to-board connector (103) after passing through a delay circuit (153) . Still further, a control signal is output to a switching circuit (151) from a control signal generating section (162) through the board-to-board connector (103) . The delay circuit (153) increases a time lag from when the control signal passes through the board-to-board connector (103) until when the baseband signal passes through the board-to-board connector (103) by applying a predetermined delay time to the baseband signal. Thereby, the baseband signal receives no interference from the control signal. [A1267]

"Mitigation of drift effects in secondary inertial measurements of an isolated detector assembly"

The 6-axis position and attitude of an imaging vehicle's detector assembly is measured by mounting the detector assembly on a compliant isolator and separating the main 6-axis IMU on the vehicle from a secondary IMU comprising at least inertial rate sensors for pitch and yaw on the detector assembly. The compliant isolator couples low-frequency rigid body motion of the vehicle below a resonant frequency to the isolated detector assembly while isolating the detector assembly from high-frequency attitude noise above the resonant frequency. A computer processes measurements of the 6-axis rigid body motion and the angular rate of change in yaw and pitch of the isolated detector assembly to mitigate the drift and noise error effects of the secondary inertial rate sensors and estimate the 6-axis position and attitude of the detector assembly. [A1268]

"Method and device for identifying and classifying objects"

A method and device for identifying and classifying objects, electromagnetic radiation being emitted by a sensor, the radiation components reflected on objects being received by the sensor, the received signals being analyzed by comparison with stored characteristic values and the class of the reflecting object being deduced on the basis of the analysis. To this end, an analyzer is provided for analyzing the received signals, a memory is provided for storing characteristic patterns, its stored patterns being compared with the analyzed signals and thus the class of the reflecting objects being deducible on the basis of the comparison. [A1269]

"Tracking running control apparatus"

A tracking running control apparatus determines a failure-predicted segment where distance measurement using a laser radar is predicted to undergo a failure. Upon reaching the failure-predicted segment, a distance measurement device used in tracking running control is changed from the distance measurement device using the laser radar to a distance measurement device using a GPS receiver. Before the change of the distance measurement devices, a target inter-vehicle distance is gradually changed to a GPS-utilized target inter-vehicle distance through changing a vehicle speed with an acceleration equal to or less than a predetermined value. Under the configuration, it is possible to suppress annoyance for a driver of the vehicle because of the change of the target inter-vehicle distances accompanying the change of the distance measurement devices. [A1270]

"RFID tag movement determination"

A system, techniques, and apparatus for determining RFID tag movement are disclosed. The system includes an RFID reader that is configured to detect an RFID tag's motion by comparing backscattered signals received from the tag. The system can also generate and filter alerts according to pre-defined business rules based on the detection. [A1271]

"Goal detector for detection of an object passing a goal plane"

A system is disclosed for detection of whether a movable object, such as a sports object, e.g. a football or an ice hockey puck, has passed goal plane. It is known to encircle the goal plane with conductors (1, 2, 3, 4) to produce an electromagnetic field to excite signal emitter means in the movable object, alternatively detect the signal emitted by the emitter means. With the present invention these circuits are sectioned into a plurality of separate circuits, which provides an improved spatial resolution of the system in particularly when the movable object is close to the conductors. [A1272]

"Method and device for determining the thickness of material using high frequency"

The present invention relates to a method for determining the thickness of material by penetrating the material, in particular a method for measuring the thickness of walls, ceilings and floors, with which a measurement signal (28) in the gigahertz frequency range emitted using a high-frequency transmitter (24) penetrates the material (10) to be investigated at least once and is detected by a high-frequency receiver (38) . According to the present invention, it is provided that the thickness (d) of the material (10) is measured via at least two transit-time measurements of the measurement signal (28) performed at various positions (20, 22) of the high-frequency transmitter (24) and/or the high-frequency receiver (34) . The present invention also relates to a device system (12, 40, 140, 240, 340) for carrying out the method described above. [A1273]

"Method for determining relative motion using accelerometer data"

A method is disclosed for determining relative motion between equipment systems positioned on a structure that is subject to deformation due to vibrations, using accelerometers. Relative motion between equipment systems can introduce error into the targeting information provided to a system such as a weapons system, and thus the method facilitates compensation for such relative motion. A method is disclosed in which the raw accelerometer signals are filtered, then combined with attitude signals in a displacement calculation module (DCM) . Within the DCM, the signals are manipulated to calculate, for each equipment system, the translational and rotational displacements due to hull modal vibration and the translational and rotational displacements due to force vibration. The sum of these values represent the movement of each of the affected equipment systems. Relative motion between systems is calculated as the difference between the calculated movement values. [A1274]

"System and method for generating derived products in a radar network"

The present invention relates to systems and methods of measuring atmospheric conditions using networked radar systems. A processor receives sensed data from the radar nodes of the network to determine weather conditions within the atmospheric region measured by network. Preferred embodiments use a velocity processor to determine the velocity of the atmosphere in real time for display. [A1275]

"Power saving system for navigation device"

A navigation system using a mobile terminal, GPS receiver and navigation software, wherein the navigation software is arranged to switch the mobile terminal into a power saving mode if there are no further instructions needed for a determined period of time or distance. The power saving functionality comprises turning the backlight off and changing the visualization of the display for better readability without the backlight. [A1276]

"Method for operating a radar system in the event of possible concealment of the target object and radar system for performing the method"

In a method for operating a radar system and a radar system for performing the method, in particular a microwave radar system for applications in or on motor vehicles, in which at least one target object and at least one possible concealing object are detected using radar technology, it is provided in particular that a detection is made of whether a concealment situation of the at least one target object by the at least one concealing object exists, and in the case of a detected concealment situation a loss of the target object is not automatically assumed. [A1277]

"Detection device of a motor vehicle and a corresponding detection method"

A detection device of a motor vehicle having a functional unit for transmitting and receiving signals. The functional unit has at least one first and one additional functional element, the signal inputs of which are subject to a comparison to determine an associative signal occurrence, and if the signals are absent in one of the functional elements, a configuration of its transmission/reception range to a road surface to be detected is performed in such a way that the corresponding functional element is forced to received signal reflections if it is functioning. A corresponding method is also provided. [A1278]

"System and method for detecting, locating and identifying objects located above the ground and below the ground in a pre-referenced area of interest"

The invention relates to a system and method for detecting, locating and identifying objects located above ground or below ground in an area of interest, comprising an airborne vehicle which circumscribes the area of interest and which includes a built-in radar having an antenna with a respective transmitter and receiver, signal-processing means, data-storage means and graphical interface means. According to the invention, the area of interest has been pre-referenced and the radar is a heterodyne ground penetration radar (GPR) . The signal transmitted by the antenna generates a beam that illuminates a strip of earth, consisting of a sinusoidal electromagnetic signal having a frequency that is varied in precise pre-determined progressive steps. This signal is mixed with the received (reflected) signal, thereby producing two sets of values corresponding to the phases of each frequency step or stage. Said sets of values, which are obtained throughout successive sweeps (as the antenna moves) , are stored in the storage means and subsequently processed in the processing means in order to obtain a final map or image of the location of the objects above ground or below ground. [A1279]

"Travel guiding apparatus for vehicle, travel guiding method for vehicle, and computer-readable storage medium"

A travel guiding apparatus, method, and program for a vehicle store map information and marker pattern identification information used to identify a marker pattern for each road type, wherein the marker pattern is a pattern of a marker included in a lane marking. The apparatus, method, and program determine a type of road on which the vehicle is traveling and detect the maker pattern on the road. The apparatus, method, and program again determine the type of the road based on the detected marker pattern and change the type of determined road from a road other than an expressway to an expressway, if the first detected type of road is a road other than an expressway and the type of road detected based on the marker pattern is an expressway. [A1280]

"Host-vehicle risk acquisition device and method"

A host-vehicle risk acquisition device includes a host-vehicle path acquisition portion that acquires a path of a host-vehicle, and an obstacle path acquisition portion that acquires a plurality of paths of an obstacle existing around the host-vehicle. A collision risk acquisition portion acquires an actual collision risk, which is a collision risk between the host-vehicle and the obstacle when the host-vehicle is in a travel state based on the path of the host-vehicle and the plurality of paths of the obstacle. An offset risk acquisition portion acquires an offset risk, which is a collision risk between the host-vehicle and the obstacle in an offset travel state, which is offset from the travel state of the host-vehicle. [A1281]

"System and method for moving target detection"

A system and method of detecting moving targets comprises transmitting electromagnetic waves rays from a plurality of transmitters at sequential, receiving reflected waves into a plurality of receivers after each transmission, the compilation of the reflected waves from the plurality of receivers for each transmission representing a data frame, forming a signal that monitors changes between the two sets of frames, at least one processor operating to process and compare frames, forming a difference image using a back-projection algorithm, scanning the difference image using a constant false alarm rate (CFAR) window, the CFAR window scanning the entire difference image and identifying a list of points of interest and eliminating the sidelobe artifacts present in the difference image thereby creating CFAR images, processing the CFAR images using morphological processing to create a morphological image, determining the number of clusters present in the morphological image, using K-means clustering to indicate the centroid of each cluster, and tracking using a Kalman filter. The system comprises a plurality of M transmitters, a plurality of receivers, and at least one memory, the transmitters operating in sequence to transmit electromagnetic waves rays sequentially, the receivers receiving reflected waves after each transmission, the compilation of the reflected waves from the plurality of receivers for each transmission representing a data frame, at least one processor operating to perform the method. [A1282]

"Method for detecting a bird or a flying object"

A method detects a bird or an object flying level with a single wind turbine, using a device for radio wave detection of at least one bird or another flying object, in the form of at least one radar. The analog image from each radar is transformed into a digital image and an outer safety area and an inner safety area is defined for the image. A safety space for each radar is defined and an action is performed in the event of a detection within the safety areas. [A1283]

"Method of correcting reflectivity measurements and radar implementing this method"

A method of correcting reflectivity measurements performed by a radar, such as a weather radar, includes a reflectivity measurement being associated with a resolution volume. The method includes acquiring the reflectivity measurement Z.sub.m corresponding to the current resolution volume, estimating the attenuation k.sub.c introduced by the cloud droplets, said estimating being carried out by using an average vertical profile of the cloud liquid water content, estimating the attenuation k.sub.g,O2 introduced by dioxygen, estimating the attenuation k.sub.g,H2O introduced by the water vapor, determining the total specific attenuation k of the non-detectable components taking into account the attenuation k.sub.c, the attenuation k.sub.g,O2 and the attenuation k.sub.g,H2O estimated in the preceding steps, and correcting the measured reflectivity taking into account the estimated total specific attenuation k. The method may be implemented by an onboard weather radar. [A1284]

"Systems including mobile devices and head-mountable displays that selectively display content, such mobile devices, and computer-readable storage media for controlling such mobile devices"

A system includes a head-mountable display and a mobile device. The mobile device includes a position acquisition device that acquires positional information indicating a position of the mobile device. The mobile device includes a first orientation acquisition device that acquires first orientation information indicating an orientation of the mobile device with respect to a reference direction. The mobile device includes a first display that displays content based on the positional information and the first orientation information on the mobile device when a condition is satisfied. The mobile device includes a first receiver that receives second orientation information indicating an orientation of the head-mountable display with respect to one or more of the reference direction and the orientation of the mobile device. The mobile device includes a first transmitter that transmits content based on the positional information and the second orientation information when the condition is not satisfied. [A1285]

"Two-dimensional array antenna and device for detecting internal object using the same"

Provided are a two-dimensional array antenna and a device for detecting an internal object using the same. The device includes a plurality of unit antennas in a two-dimensional array of m columns and n rows on a board (where m and n are integers greater than 1) , a first switch selecting one or more transmitting antenna to radiate a pulse signal onto an internal object in a structure from among the unit antennas, a second switch selecting one or more receiving antenna to collect a signal reflected from the internal object from among the unit antennas, and a transceiving analysis module analyzing information about the position and shape of the internal object. [A1286]

"System for response to a signal transmitted by a radar and use of this system notably for testing radars, in particular of the MTI type"

A system for response to a signal transmitted by a radar includes: a passive antenna capable of receiving and then backscattering a signal transmitted by said radar, a microwave switch connected to said antenna, at least two microwave lines each having a distinct impedance and being connected to the microwave switch, and a generator capable of generating a parametrizable control signal and sending it to the microwave switch so that it switches onto one or other of the microwave lines, so as to modulate the signal backscattered by said antenna. [A1287]

"Sensor assembly and method of measuring the proximity of a machine component to an emitter"

A microwave sensor assembly includes at least one probe including an emitter configured to generate an electromagnetic field from at least one microwave signal. The emitter is also configured to generate at least one loading signal representative of a loading induced within the emitter by an object positioned within the electromagnetic field. The microwave sensor assembly also includes a signal processing device coupled to the at least one probe. The signal processing device includes a linearizer configured to generate a substantially linear output signal based on the at least one loading signal. [A1288]

"Method and system for parking assistance and recognizing obstacle"

Disclosed are a system and method for recognizing an obstacle at the time of parking. The inventive system includes: at least one lateral side ultrasonic sensor for sensing lateral distance data between a user's vehicle and an obstacle positioned adjacent to a lateral side of the user's vehicle, a first course calculation unit for calculating lateral position data and a first course on the basis of the lateral distance data, at least one rear side ultrasonic sensor for sensing rear distance data indicating a distance between the user's vehicle and an obstacle positioned behind the rear side of the user's vehicle, a second course calculation unit for extracting rear position data for the obstacle positioned behind the user's vehicle on the basis of the rear distance data, and for extracting and calculating a final target parking position and a final course on the basis of the rear position data, and a control unit which receives information for the first course from the first course calculation unit so as to control the steering wheel of the user's vehicle, thereby moving the user's vehicle forward or backward along the first course, and receives information for the final target parking position and the final course from the second course calculation unit so as to control the steering wheel, thereby moving the user's vehicle is moved along the final course and automatically parked at the final target parking position. [A1289]

"Methods and apparatus for ultrasound imaging"

Some embodiments include acquisition of color Doppler data, and detection of one or more transitions of the color Doppler data, each of the one or more transitions being between a first area representing flow velocity in a first direction and a second area representing flow velocity not in the first direction. A normalized energy function across one or more of the one or more transitions is calculated, a configuration of flow areas within the color Doppler data is determined, and aliasing corrections for the color Doppler data are determined based on the normalized energy functions and the configuration of flow areas. [A1290]

"System and process for controlling a person"

System for controlling a person (P) , characterized in that it comprises: a kiosk (10) with an analysis zone (16) destined to accommodate a person (P) to control, a frame (30) disposed inside the kiosk (10) , the frame having a hollow (32) , a plurality of sensors (31) disposed on the frame (30) , each sensor being able to collect information from a portion of the hollow (32) and to generate signals representative of the information, an actuator (20) for translating the frame (30) inside the kiosk (10) , a frame envelop (33) being defined by the translation of the hollow (32) when the frame (30) is translated, the analysis zone being included in the frame envelop, a processing unit (60) for analysing the signals generated by each of the plurality of sensors (31) and to detect from the signals the possible presence of searched items within the analysis zone (16) . [A1291]

"Motion sensor braking system and associated method"

An automatic vehicle braking system prohibits vehicle propulsion upon detection of a triggering event, and includes sensors that detect the triggering event, a processor. A logic gate and a vehicle gear sensor cooperate with the processor to automatically activate and deactivate a vehicle braking system, which includes a solenoid switch responsive to an output signal from the logic gate. An air valve is activates the vehicle braking system by permitting air to pass downstream of the air valve and to existing vehicle brake pads. An outlet port is situated downstream from the inlet port of the air valve casing. A piston is linearly reciprocated within the casing such that the inlet port is in fluid communication with the existing air tank of the vehicle. In this manner, the outlet port may be adapted to be in fluid communication with an existing brake pad of the vehicle braking system. [A1292]

"Resolution enhancement system (RES) for networked radars"

Embodiments provide methods, systems, and/or devices that can provide measurements of the inherent reflectivity distribution from different look angles using N radar nodes. Doppler weather radars generally operate with very good spatial resolution in range and poor cross range resolution at farther ranges. Embodiments provide methodologies to retrieve higher resolution reflectivity data from a network of radars. In a networked radar environment, each radar may observe a common reflectivity distribution with different spreading function. The principle that the underlying reflectivity distribution should remain identical for all the nodes may be used to solve the inverse problem to determine intrinsic reflectivities. [A1293]

"Methods and apparatus for automatic STC from sea state measurement via radar sea clutter eccentricity"

Methods and apparatus to receive radar return information from signals transmitted by a radar, process the radar return information to identify sea clutter, process the sea clutter to fit an ellipse to arrange horizon of the sea clutter as a function of azimuth to determine a sea state, and select sensitivity time control (STC) attenuation of the sea clutter based upon the sea state. [A1294]

"Methods and apparatus for sea state measurement via radar sea clutter eccentricity"

Methods and apparatus to fit the range extent of radar sea clutter to an ellipse to determine sea state. From one or more ellipse parameters, a sea state, which can include direction, can be identified. In one embodiment, the system autonomously determines the sea state and automatically selects non-isotropic STC filtering based on the ellipse that measures the sea state. [A1295]

"Mobile radar system"

Described is a mobile radar system which provides both persistent surveillance and tracking of objects with adaptive measurement rates for both maneuvering and non-maneuvering objects. The mobile radar system includes a vehicle having mounted therein an active, electronically-steerable, phased array radar system movable between a stowed position and a deployed position and wherein the phased array radar system is operational in both the deployed and stored positions and also while the vehicle is either stationary or moving. Thus, the mobile radar system described herein provides for longer time on target and longer integration times, increased radar sensitivity and improved Doppler resolution and clutter rejection. This results in a highly mobile radar system appropriate for use in a battlefield environment and which supports single-integrated-air-picture metrics including but not limited to track purity, track completeness, and track continuity and thus improved radar performance in a battlefield. [A1296]

"Weather radar apparatus and weather observation method"

According to one embodiment, a weather radar apparatus includes an antenna unit, a drive unit, an adjustment unit, and a control unit. The antenna unit is configured to transmit radio waves from a plurality of antenna elements, perform beam scan in a direction of elevation angle by phase control, and receive waves reflected by a weather target. The drive unit is configured to drive an elevation angle and an azimuth angle of an aperture plane of the antenna unit. The adjustment unit is configured to adjust an observation range and an observation elevation angle by the antenna unit and the drive unit in accordance with a plurality of observation modes. The control unit is configured to set the observation mode based on a received signal of the reflected waves. [A1297]

"Scanning polarized RF reference sources for angular orientation measurement for munitions and the like"

A method for determining an angular orientation of a sensor relative to a source. The method including: amplitude modulating at least two synchronized polarized Radio Frequency (RF) carrier signals with a predetermined relationship between their amplitude modulation of their electric field components and their polarization states to provide a scanning polarized RF reference source with a desired scanning range, pattern and frequency, detecting the scanning polarized RF reference source at the sensor, and using peak detection or pattern matching analysis on a signal detected at the sensor to determine the angular orientation of the sensor relative to scanning polarized RF reference source. [A1298]

"Monostatic multibeam radar sensor device for a motor vehicle"

A monostatic multibeam radar sensor device for a motor vehicle, including a directional characteristic of an antenna unit having at least one transceiving channel and at least one receiving channel, and including a mixer system, which has an at least approximately isolating mixer for at least one of the receiving channels. The at least approximately isolating mixer includes a Gilbert cell mixer, which, due to a non-ideal isolation between an input of the local oscillator signal and the corresponding receiving channel, emits a transmission power via this receiving channel, using an overcoupling signal, the transmission power influencing the directional characteristic of the antenna unit and the directional characteristic being switchable by controlling the phase position of the overcoupling signal. [A1299]

"System and method for detecting obstructions and misalignment of ground vehicle radar systems"

A system, controller, antenna, and method for detecting obstruction and misalignment of a ground vehicle radar having an antenna configured to detect objects in a first direction characterized as being substantially parallel to a horizontal plane about the ground vehicle, and detect objects in a second direction characterized as being toward a roadway surface proximate to the ground vehicle. The second direction radar return from the roadway is expected to have certain characteristics. If the characteristics are outside of a predetermined window, then obstruction and/or misalignment of the first direction and the second direction is likely, and so the radar may not reliably detect an object in the first direction, such as a vehicle in an adjacent lane. [A1300]

"Radar sensor and method for operating a radar sensor"

In operating a radar sensor, a modulation sequence having a number n of successive linear frequency ramps having different slopes a.sub.n is cyclically repeated. A received radar signal reflected from an object is mixed with the emitted radar signal to form an intermediate frequency signal, which is analyzed for each frequency ramp with respect to its frequency spectrum. Peaks occurring in the frequency spectra of the intermediate frequency signal correspond to ambiguity lines in a distance/velocity space. Possible objects are assumed at intersection points of the ambiguity lines. The expected position which the possible objects would have at the point in time of the repetition of the modulation sequence is precalculated. The slope a.sub.n of at least one of the frequency ramps is established for a subsequent modulation sequence in such a way that none of the expected positions of a possible object in the distance/velocity space is at an intersection point of precalculated ambiguity lines of the other possible objects. [A1301]

"Radar system comprising overlapping transmitter and receiver antennas"

A radar system for recording the environment of a motor vehicle includes transmission antennas for emitting transmission signals, receiver antennas for receiving transmission signals reflected by objects in the environment, and a signal processor for processing the received signals. The antennas are planar and are situated on a level surface. Received signals are acquired from different combinations of the transmitter and receiver antennas. In the signal processor, the angular position of objects in a spatial direction R is estimated from the received signals, based on recognition that the received signals from an individual object have different phase positions depending on the angular position of the object in the spatial direction R. Two of the transmitter and receiver antennas overlap in the spatial direction R without coinciding, by special arrangements or configurations of the transmitter and receiver antennas. [A1302]

"Determining at least one coordinate of an object using intersecting surfaces"

In an embodiment, a coordinate determiner is operable to identify at least first and second surfaces that each approximately intersect an object, and to determine at least two approximate coordinates of the object from the first and second surfaces, where at least one of the surfaces is nonplanar. for example, if the coordinate determiner is disposed on a fighter jet having at least two short-baseline-interferometers (SBIs) , then two surfaces may be the surfaces of two cones having two of the SBIs as respective vertices, the object may be a close-in target, and the coordinate determiner may determine the azimuth and elevation of the target from the cone surfaces. Furthermore, the coordinate determiner or another computation unit onboard the jet may determine the slant range of the target from the elevation and the altitude of the jet. The coordinate determiner may at least facilitate ranging of the target quickly enough to allow a pilot sufficient time to evade detection by the target, to destroy the target, or to evade or destroy a projectile fired by the target. [A1303]

"Automotive radar system and method for using same"

A radar system (44) for a vehicle (42) includes a transmit unit (56) and a receive unit (58) . The transmit unit (56) includes a single beam antenna (72) for output of a radar signal (74) into a target zone (46) . The receive unit (58) includes a single beam antenna (76) for receiving a direct receive signal (78) and an indirect receive signal (80) . The receive signals (78, 80) are reflections of the radar signal (74) from an object (34, 36) in the target zone (46) . The indirect receive signal (80) is reflected off the object (34, 36) toward a reflective panel (54) of the vehicle (42) , and the indirect receive signal (80) is reflected off the reflective panel (54) for receipt at the receive antenna (76) . The receive signals (78, 80) are summed to produce a detection signal (81) indicating presence of the object (34, 36) in the target zone (46) . [A1304]

"Method and apparatus for the nowcast of lightning threat using polarimetric radar"

A system and method for predicting the probability of cloud-to-ground lightning strikes, `frequent`, more than 2 strikes per minute on average, cloud to ground lightning strikes, and/or `numerous`, more than 4 strikes per minute on average, through the use of polarimetric radar is presented. The data volume created by the polarimetric radar is processed to identify the type of hydrometeors in each range cell. for each vertical column, the maximum height of the graupel is compared to the lowest height of ice crystals in the volume. In the event that the lowest height of ice crystals is ambiguous, the height of the temperature where ice crystals form, -10.degree. C., may be substituted for the lowest height of the ice crystals. Probability density functions are applied to the height difference to determine the probability of cloud to ground lightning within the column. Lightning probability product data are displayed on a visualization system in a georeferenced manner providing georeferenced lightning warnings. A forecast of the probabilities of cloud-to-ground lightning is determined by simple translation using storm track properties. [A1305]

"Radar apparatus for use in vehicle"

The radar apparatus includes a target candidate detecting means for detecting a peak frequency at which the intensity of the power spectrum of a beat signal peaks as a target candidate, a road shape recognizing means to sequentially connect, along a predetermined direction, the target candidates detected to be stationary and present within a reference distance from one of the target candidates set as a reference target candidate for one or more measurement cycles and recognize an area formed by the sequentially connected target candidates as an edge of the road, a cruise environment estimating means to determine whether the cruise environment is a closed space or an open space based on the power spectrum, and a reference distance correcting means to shorten the reference distance when the cruise environment is determined to be a closed space. [A1306]

"Tracking moving radar targets with parallel, velocity-tuned filters"

Radar data associated with radar illumination of a movable target is processed to monitor motion of the target. A plurality of filter operations are performed in parallel on the radar data so that each filter operation produces target image information. The filter operations are defined to have respectively corresponding velocity ranges that differ from one another. The target image information produced by one of the filter operations represents the target more accurately than the target image information produced by the remainder of the filter operations when a current velocity of the target is within the velocity range associated with the one filter operation. In response to the current velocity of the target being within the velocity range associated with the one filter operation, motion of the target is tracked based on the target image information produced by the one filter operation. [A1307]

"Vehicle collision avoidance system"

A method for collision avoidance for a machine is disclosed. The method includes detecting an obstacle with an obstacle detection system and generating a corresponding signal. The obstacle detection system includes an operator input device. The method also includes providing an obstacle detection warning in response to the signal. The method further includes determining with a controller whether the operator input device has been activated in response to the obstacle detection warning. [A1308]

"Sub-millimeter wave RF and ultrasonic concealed object detection and identification"

Active and passive sub-millimeter wave RF and ultrasonic systems can be used to detect a concealed object, such as an object concealed under the clothing of a subject, and identify material properties of the object. A concealed object detection system can include an antenna configured to receive an RF signal in the sub-millimeter wave range, the RF signal having been emitted by an object, a detector configured to convert the RF signal into an electrical signal, a signal integrator configured to integrate the electrical signal and provide an integrated signal over an observation period and a processor configured to extract object information from the integrated signal. An object indication device provides an indication of a detected object and material properties of the detected object based on the extracted object information. The extracted object information can include object image data and object material identification data. [A1309]

"Weather radar apparatus and signal processing method thereof"

According to one embodiment, a weather radar apparatus includes a transmitting/receiving unit configured to transmit a radar wave to an observation target and receive a reflected wave, a distribution unit configured to distribute a received signal of the reflected wave to a main path and at least another path, an extraction unit configured to extract, from a signal of the other path, an interference wave signal extracted from another radio station, and a removing unit configured to remove the interference wave signal extracted from a signal of the main path. [A1310]

"Chaff cloud detection and centroid estimation"

A method and system for detecting chaff is disclosed. The method includes receiving range profile data including a plurality of samples, determining an average power for a first group of samples of the range profile data and a second group of samples of the range profile data, comparing the average power for the first group of samples to a first threshold value and the average power for the second group of samples to a second threshold value, and identifying a chaff detection if an average power of at least one of the first and second groups of samples exceeds its respective threshold value. The system includes a computer readable medium and a processor in communication with the computer readable storage medium and configured to perform the receiving, determining, comparing and detecting steps. [A1311]

"High resolution wind measurements for offshore wind energy development"

A method, apparatus, system, article of manufacture, and computer readable storage medium provide the ability to measure wind. Data at a first resolution (i.e., low resolution data) is collected by a satellite scatterometer. Thin slices of the data are determined. A collocation of the data slices are determined at each grid cell center to obtain ensembles of collocated data slices. Each ensemble of collocated data slices is decomposed into a mean part and a fluctuating part. The data is reconstructed at a second resolution from the mean part and a residue of the fluctuating part. A wind measurement is determined from the data at the second resolution using a wind model function. A description of the wind measurement is output. [A1312]

"Method and device for avoiding and/or reducing the consequences of collisions upon evasion with respect to obstacles"

A method and a device for assisting a driver of a vehicle to avoid collisions with obstacles are provided, in which method at least one obstacle is detected by way of at least one surroundings sensor, and data of the obstacle are ascertained. On the basis of the data of the obstacle and data of the vehicle, a vehicle deceleration that is favorable for assistance of an evasive operation is ascertained, and the vehicle is correspondingly decelerated. [A1313]

"Antenna array for a radar transceiver and circuit configuration for supplying an antenna array of such a radar transceiver"

An antenna array for radar transceivers, in particular for ascertaining distance and/or speed in the surroundings of vehicles, a first antenna part being situated on a carrier and a second antenna part being situated on another carrier situated at a distance from the first. The first antenna part has two generally rectangular primary exciter patches which adjoin each other on one edge, where they are short-circuited toward ground, two primary exciter patches have two separate supply lines, and the second antenna part comprises two mutually separated rectangular secondary exciter patches, which partially cover the primary exciter patches and which have, in the region of the ground short-circuit of the primary exciter patches, in the beam direction, a distance from each other that at least exposes the ground short-circuit. [A1314]

"Radar system with elevation measuring capability"

A radar system transmits signals for recording the environment of a motor vehicle, and the signals are reflected back from objects in the environment. Received signals are acquired from different combinations of transmitter and receiver antennas of the system. With regard to a series of such antenna combinations having their respective phase centers ordered in a spatial direction R, the positions of the phase centers of the combinations vary periodically with the period length P in a spatial direction S that runs perpendicular to the spatial direction R. Signal processing circuitry makes conclusions about the position of an object in the spatial direction S, based on an evaluation that the received signals from the object have a phase portion that alternates with the period length P over the antenna combinations ordered as set forth above, depending on the angular position of the object in the spatial direction S. [A1315]

"Motor vehicle FMCW radar having linear frequency ramps of different slopes that are set apart, which are associated with different angular ranges"

An FMCW radar locating device includes a transmitting device having a controllable transmitting-signal-generating device generating a transmitting signal having a frequency corresponding to an input control signal, a control device connected to the transmitting-signal-generating device and generating the input control signal which controls the transmitting signal such that it rises periodically in a discontinuous, inconsistent linear fashion in first frequency segments, and drops periodically in a discontinuous, inconsistent linear fashion in second frequency segments, and a receiving device for receiving an echo signal reflected by an object and locating an object based on the received echo signal. [A1316]

"GPS navigation code system"

A GPS navigation code device that enables a driver to retrieve directions, without taking his eyes off the road. The user pre-programs the GPS navigation code device with a plurality of addressees or points of interest, and assigns unique navigation codes for each as keyboard entry and speech, all stored in local database within the GPS. While driving, the user presses a special address search mode key and inputs the unique navigation code by keyboard or speech pattern, views displayed address and accepts the same. When an unknown navigation code is entered, the GPS accesses a remote database through the Internet to recover the associated company name and business GPS coordinates. The remote database computes travel distance based on vehicle and business GPS coordinates, creating an ordered list that is presented to the GPS user, together with directions by map and speech on a turn-by-turn basis. [A1317]

"Low cost, high performance radar networks"

A real-time radar surveillance system comprises at least one land-based non-coherent radar sensor apparatus adapted for detecting maneuvering targets and targets of small or low radar cross-section. The radar sensor apparatus includes a marine radar device, a digitizer connected to the marine radar device for receiving therefrom samples of radar video echo signals, and computer programmed to implement a software-configurable radar processor generating target data including detection data and track data, the computer being connectable to a computer network including a database. The processor is figured to transmit at least a portion of the target data over the network to the database, the database being accessible via the network by at least one user application that receives target data from the database, the user application providing a user interface for at least one user of the system. [A1318]

"Vehicular traffic surveillance doppler radar system"

A vehicular traffic surveillance Doppler radar system and method for use of the same are disclosed. In one embodiment, the system comprises a modulation circuit portion for generating modulated FM signals. An antenna circuit portion transmits the modulated FM signals to a target and receives the reflected modulated FM signals therefrom. A ranging circuit portion performs a quadrature demodulation on the reflected modulated FM signals and determines a range measurement based upon phase angle measurements derived therefrom. [A1319]

"Device and method of detecting a target object for motor vehicle"

A device and method for correcting a position of at least one target point relative to a motor vehicle depending on a movement of the motor vehicle over a given number of cycles, starting from at least one target point, forming a first group with adjacent target points depending on a first given characteristic, verifying if the first group is homogeneous depending on a second given characteristic, and calculating a position of a formed group relative to the motor vehicle over the given number of cycles, a formed group corresponding to a target object. [A1320]

"Rotational parabolic antenna with various feed configurations"

A rotational antenna includes a stationary feed which is disposed in a substantially vertical orientation. A parabolic dish is rotationally mounted about the stationary feed in a state of being tipped with respect to the stationary, substantially vertically oriented feed. The rotational parabolic antenna may alternatively be provided with a rotating radio frequency (RF) and acoustic feed. Other embodiments are disclosed. [A1321]

"In-vehicle radar device and cover for in-vehicle radar device"

An in-vehicle radar device which radiates electromagnetic waves and receives reflected waves, from an object, of the electromagnetic waves so as to detect a location of the object and which is mounted on a rear of a vehicle, the in-vehicle radar device including: a transmission-and-reception section that transmits the electromagnetic waves and receives the reflected waves, a detection section that detects the location of the object based on the reflected waves, and a cover member that is provided below a rear bumper of the vehicle and that covers the transmission-and-reception section in a manner that a rear surface of the cover member faces a transmission-and-reception surface of the transmission-and-reception section so as to be spaced apart therefrom. [A1322]

"Method for determining compound data of weather radars in an overlapping region of the monitoring regions of at least two weather radars"

Method for determining combined data of weather radars (1) in an overlap region (2) of the observation regions of at least two weather radars (1) , with polarimetric weather radars (1) being used as weather radars (1) , and the measurements of the individual at least two polarimetric weather radars (1) being combined for measuring points in the overlap region (2) , and the combined measuring points being used to carry out a radar echo classification. [A1323]

"Long range millimeter wave surface imaging radar system"

A long range millimeter wave imaging radar system. Preferred embodiments are positioned to detect foreign object debris objects on surface of the runway, taxiways and other areas of interest. The system includes electronics adapted to produce millimeter wave radiation scanned over a frequency range of a few gigahertz. The scanned millimeter wave radiation is broadcast through a frequency scanned antenna to produce a narrow scanned transmit beam in a first scanned direction (such as the vertical direction) defining a narrow, approximately one dimensional, electronically scanned field of view corresponding to the scanned millimeter wave frequencies. The antenna is mechanically pivoted or scanned in a second scanned direction perpendicular to the first scanned direction so as to define a two-dimensional field of view. [A1324]

"Observation signal processing apparatus"

An observation signal processing apparatus transmits a pulse signal as a search signal, generates an observation value based on a reflected signal against a target and a delay modulation pulse signal, and performs coherent integration on the observation value to output an integration value. The apparatus includes a section for determining a coherent integration count, a section for transmitting pulse signals equivalent to the coherent integration count, a section for calculating a phase correction amount based on an estimated relative speed, and a section for performing phase-weighted coherent integration on observation values for the number of times equivalent to the coherent integration count based on the phase correction amount. [A1325]

"Notch antenna having a low profile stripline feed"

Described are a notch antenna and an array antenna based on a low profile stripline feed. The notch antenna includes a planar dielectric substrate having upper and lower surfaces. Each surface has a conductive layer with an opening therein. A notch antenna element is disposed on the conductive layer of the upper surface at the opening. A stripline embedded in the planar dielectric substrate extends under the notch antenna element. The stripline is adapted to couple an RF signal between the stripline and the notch antenna element. A conductive via is electrically coupled to the stripline and extends from the stripline to the opening in the conductive layer on the lower surface so that the RF signal is accessible at the lower surface. [A1326]

"Radar level gauge system with bottom reflector and bottom reflector"

A radar level gauge system, for determining a filling level of a product contained in a tank, the radar level gauge system comprising: a transceiver for generating, transmitting and receiving electromagnetic signals, a propagating device electrically connected to the transceiver and arranged to propagate a transmitted electromagnetic signal towards a surface of the product contained in the tank, and to return echo signals resulting from reflections at impedance transitions encountered by the transmitted electromagnetic signal, including a surface echo signal resulting from reflection at the surface, back to the transceiver, processing circuitry connected to the transceiver and configured to determine the filling level based on the surface echo signal, and a bottom reflector arranged at a bottom of the tank. The bottom reflector comprises a plurality of phase-modifying structures, each being configured to modify a phase of the transmitted electromagnetic signal and to reflect phase-modified electromagnetic signals, wherein the plurality of phase-modifying structures are arranged in such a way that phase-modified electromagnetic signals being reflected by different phase-modifying structures interact to provide destructive interference towards the propagating device. [A1327]

"Surveillance with subject screening"

A surveillance system is disclosed. In some embodiments, the surveillance system may include at least one controller adapted to control operation of first and second screening apparatus and to produce image data and screening data, to relate the image data to the screening data, and to produce relational information data from the related image data and screening data. In some embodiments, the system may include a first screening apparatus adapted to screen a subject in a subject position, a second screening apparatus adapted to screen the subject in the subject position, and a controller adapted to produce first and second screening data from the first and second screening apparatus, respectively, relate the first and second screening data, and to produce relational information data from the related first and second screening data. [A1328]

"Low-profile omnidirectional retrodirective antennas"

Embodiments of the invention are directed to retrodirective radio-frequency systems wherein a transmit antenna array includes at least one row of N transmit elements and a receive antenna array includes at least one row of N receive elements that correspond one-to-one to the transmit elements and wherein the transmit and receive elements are located on spaced planes, and centered about a common axis and located at common transmit distance and a common receive distance, respectively. In some embodiments the one row of transmit and receive elements comprises "n" rows of elements, where "n" is an integer greater than one, thereby forming a two-dimensional array. In some embodiments the total transmit radiation pattern provides an azimuth coverage of 360 degrees. In other embodiments, it may provide less coverage but be operable as independent sectors. In some embodiments, the desired transmit wave form will be identical between all transmit elements of the array, one possible example being pseudo random noise imparted on a sinusoidal carrier. [A1329]

"Apparatus and sensor for adjusting sensor vertical alignment"

Provided are a sensor capable of adjusting vertical alignment and a sensor vertical alignment adjusting apparatus using the same. The sensor has a structure with a plurality of switchable transmitting and receiving antennas so as to be able to adjust the vertical alignment, or a structure with a tilting motor for adjusting a radiating or receiving angle. The sensor vertical alignment adjusting apparatus using such a sensor corrects vertical misalignment of the sensor by determining whether or not the vertical misalignment of the sensor occurs, variably switching one from among the plurality of transmitting or receiving antennas of the sensor or controlling the tilting motor, and adjusting the radiating angle of the sensor signal or the receiving angle of a reflected wave of the sensor signal. [A1330]

"Radar sensor for motor vehicles"

Radar sensor for motor vehicles, having a transmitting and receiving device for microwaves, in which beam-shaping devices which are independent of one another are provided for the azimuth and the elevation, and the beam-shaping device for the elevation has a cylindrical lens. [A1331]

"On-vehicle radar device"

A radar device includes: a frequency modulating unit for modulating a frequency of a transmission signal by a triangular wave, a transmitting unit for pulsing the frequency modulated transmission signal to transmit the pulsed transmission signal as a transmission pulse, a receiving unit for generating a beat signal based on a frequency difference between a frequency modulated transmission signal and a reflected received pulse, a range gate setting unit for setting a range gate that determines a sampling timing of the received pulse based on a transmitting timing of the transmission pulse, a sampling unit for sampling the beat signal in each of range gates, a distance and relative velocity calculating unit for calculating a distance to a target and a relative velocity based on the sampled beat signal, and a control unit for controlling a transmission pulse width and a range gate width depending on a subject vehicle velocity. [A1332]

"Method and apparatus for determining whether a moving entity is moving in a predetermined direction"

The present invention relates to a method and an apparatus for determining whether a moving entity is moving in a predetermined direction. A moving entity being equipped with positioning means receives data from a sender comprising information about a position of a point of interest and a position of a reference point. Based on the received data, a first position of the moving entity at a first point in time, and a second position of the moving entity at a second point in time, it is determined whether the moving entity is moving in the predetermined direction. Preferably, angular information is utilized to verify whether the moving entity is moving in the predetermined direction. [A1333]

"Method and apparatus for measuring distance in a wireless environment"

A method and apparatus for measuring a distance in a wireless environment are provided, in which a first device transmits a distance measurement signal to a second device and receives at least one response signal for the distance measurement signal from the second device, matches the received response signal with a reference signal to detect an earliest response signal, and calculates a time taken from the transmission of the distance measurement signal to the second device and the reception of the response signal from the second device using a peak value of the matched reference signal. [A1334]

"Sensor suite and signal processing for border surveillance"

A land-based smart sensor system and several system architectures for detection, tracking, and classification of people and vehicles automatically and in real time for border, property, and facility security surveillance is described. The preferred embodiment of the proposed smart sensor system is comprised of (1) a low-cost, non-coherent radar, whose function is to detect and track people, singly or in groups, and various means of transportation, which may include vehicles, animals, or aircraft, singly or in groups, and cue (2) an optical sensor such as a long-wave infrared (LWIR) sensor, whose function is to classify the identified targets and produce movie clips for operator validation and use, and (3) a supercomputer to process the collected data in real-time. The smart sensor system can be implemented in a tower-based or a mobile-based, or combination system architecture. The radar can also be operated as a stand-alone system. [A1335]

"Method and locating device for locating at least one mobile radio subscriber"

The present invention relates to a method for locating at least one mobile radio subscriber in a mobile radio network, wherein to each transmitting station a value correlated with the receive field strength of a signal from this transmitting station is allocated, including the following steps: a) from the information determined upon connection setup, a table is created per cell, in which at least one distance parameter to the transmitting station of the cell is allocated to the respective receive field strengths, b) for at least one value correlated with the receive field strength and transmitted in the measurement report, the allocated distance parameter to the transmitting station of the respective cell is read out from the table created in step a) , and c) determining at least one point satisfying the distance parameter (s) read-out in step b) . [A1336]

"Weather radar signal processing"

A method and system are described whereby a magnetron-based radar transmission signal is accurately measured, allowing for measurement of absolute phase change returns from fixed clutter targets caused by changes in the refractive index of the transmission medium. [A1337]

"Threat object map creation using a three-dimensional sphericity metric"

In order to target and intercept a desired object within a number of objects detected in an environment, detection data is received from two different sensors, where the detection data includes spatial coordinates. A set of four-point subsets (tetrahedra) are selected from each set of spatial coordinates. A number of correlation maps are determined between the first set of spatial coordinates and the second set of spatial coordinates based on the plurality of four-point subsets. The mean sphericity for each corresponding plurality of four-point subsets in the plurality of correlation maps is determined, and a threat object map based on the correlation map having the greatest mean sphericity is created. The desired object is targeted based on the correlation map. [A1338]

"Collection of meteorological data by vehicles"

Methods and mobile platforms are disclosed for using vehicles to gather meteorological data. A method identifies a location that is relevant to a particular meteorological model based on modeling parameters of the particular meteorological model. Meteorological data is collected aboard a vehicle. The meteorological data is indicative of a meteorological condition in an area within sensor range of the vehicle. At least a portion of the meteorological data is transmitted to a modeling station remote from the vehicle in response to determining that the vehicle is proximate the location. [A1339]

"Range finder and method for finding range"

Provided is a range finder. The range finder comprises a light-emitting unit, a light-receiving unit, a reflection mirror, an actuator, and a controller. The light-emitting unit emits a light pulse, and a light-receiving unit detects reflected light incident thereto. The reflection minor reflects the light pulse emitted from the light-emitting unit to a measurement space, and reflecting the reflected light reflected by an object in the measurement space so that the reflected light is incident to the light-receiving unit. The actuator allows the reflection minor to move. The controller obtains distance information from a signal detected by the light-receiving unit, and obtains location information from the actuator. [A1340]

"Method and apparatus for coherent marine radar measurements of properties of ocean waves and currents"

A method and apparatus of determining a wave height directional spectrum of an ocean wave field using the intermediate-frequency (IF) signal from marine radars with a rotating antenna, using either a fully coherent or a standard non-coherent transmitter/receiver modified for coherent-on-receive use. The method may include receiving the IF radar ocean surface echo signal for a series of transmit pulses, at a sequence of azimuthal antenna positions, and a number of antenna rotations covering several minutes, then generating a matrix of complex IF signal samples from these, deriving phases for each sample, generating the difference in phase for consecutive azimuths, then Doppler shifts, and finally radial velocities. These are interpolated to a Cartesian-transformed representation cube of samples, a subset of which is Fourier transformed in three dimensions, filtered, and the resulting power spectrum generated is used to derive ocean wave height directional spectra, frequency spectra, and root-mean-squared wave height. [A1341]

"Apparatus and imaging method with synthetic aperture for determining an incident angle and/or a distance"

The invention relates to an imaging method with synthetic aperture for determining an incident angle and/or a distance of a sensor from at least one object in space, wherein at each of a number of aperture points one echo profile is sensed. Advantageously, for several angles assumed as the incident angle, one phase correction value and/or one distance correction value is calculated, adapted profiles are generated based on the echo profiles by adapting the phase with the phase correction value for each assumed angle and/or by shifting the distance with the distance correction value, for the assumed angle, the adapted profiles are summed or integrated, and a probability distribution is derived, and a probability value for the incident angle and/or for the distance is determined therefrom. A determination of the incident angle is also possible independently of the distance, wherein it is possible to only consider velocities or accelerations. [A1342]

"Method for detecting a vehicle type, a vehicle speed and width of a detecting area by a vehicle

radar sensor"

A method for detecting a vehicle type, a vehicle speed and width of a detecting area by a vehicle radar sensor is disclosed. A radio wave is transmitted to a tracked vehicle. Subsequently, the reflective radio wave from the vehicle is received. The Doppler frequency versus time distribution is generated from the reflective radio wave. Because the reflective radio wave is influenced by the Doppler Effect, a parallelogram or a shape close to a parallelogram of a consecutive motion diagram is shown in the Doppler frequency versus time distribution of the vehicle. According to the consecutive motion diagram, certain information, such as the length and speed of the tracked vehicle and the width of the detecting area, can be acquired. [A1343]

"Method of maneuvering a moving platform with on-board obstruction"

A target in a mobile platform's obstructed zone can be cleared from the obstructed zone and engaged in the most time-efficient manner by determining the direction of the maneuver that would require the shortest amount of time to clear the target and then maneuvering the mobile platform in that direction. [A1344]

"Forward facing sensing system for vehicle"

A forward facing sensing system for a vehicle includes a windshield electronics module disposed in the vehicle cabin behind the windshield, a radar sensor device disposed within the windshield electronics module with a sensing direction forward of the vehicle, an image sensor disposed within the windshield electronics module with a viewing direction forward of the vehicle, and a control operable to analyze images captured by the image sensor in order to, at least in part, detect an object present forward of the vehicle in its direction of forward travel. The control, at least in part, determines that a potentially hazardous condition may exist in the path of forward travel of the vehicle. The radar sensor device and the image sensor collaborate in a way that enhances the sensing capability of the sensing system for the potentially hazardous condition in the path of forward travel of the vehicle. [A1345]

"Antenna system for satellite lock-on and method for operating the same"

An antenna system and a corresponding method for satellite lock-on applied to vehicles automatically lock on at least one satellite in the space by means of a lock-on signal. The technique features on a scan driving signal that initiates a space scan of the antenna system so as to obtain a scan data. According to peak values of the scan data, coordinates of a plurality of satellites in the space are realized and individually recorded. Then, after receiving a lock-on signal, the satellite coordinate of the satellite to be locked is retrieved so as to drive the antenna to point at the satellite to be locked. [A1346]

"Method and system for generating weather and ground reflectivity information"

A method, system, and computer program product for storing weather radar return data into a three-dimensional buffer. The system located on an aircraft includes a radar system that transmits a radar signal and generates a radar measurement as a result of radar return of the transmitted radar signal. A three-dimensional buffer includes a plurality of storage locations. A processor generates or updates a reflectivity value in storage locations in the three-dimensional buffer based on the generated radar measurement, a previously stored reflectivity value for the storage location, and uncertainty parameters. The uncertainty parameters of normalized radar cross section for ground elements are initialized based on a type of ground associated with each of the elements. The uncertainty parameters for weather reflectivity are initialized based on a priori information. The generated reflectivity values are stored in the three-dimensional buffer according to the storage locations. [A1347]

"Method and apparatus for using non-linear ground penetrating radar to detect objects located in the ground"

A method and apparatus for detecting objects located underground. In one advantageous embodiment, a detection system detects objects having electrical non-linear characteristics located underground. The detection system comprises a transmitter unit, a receiver, and a processor. The transmitter transmits a plurality of pulsed radio frequency signals having a first frequency and a second frequency into a ground. The receiver monitors for a response radio frequency signal having a frequency equal to a difference between the first frequency and a second frequency, wherein the response radio frequency signal is generated by an object having the non-linear conductive characteristics in response to receiving the plurality of electromagnetic signals. The processor is connected to the transmitter unit and the receiver, wherein the processor controls an operation of the transmitter unit and the receiver, wherein the object is detected when the response radio frequency signal is detected by the receiver. [A1348]

"Object recognition apparatus utilizing beam scanning for detecting widths of objects of various sizes and located at various ranges"

An object recognition apparatus performs a sweep of a scanned region by transmitting scanning wave beams at respective scan angles and successive timings, derives a received-wave signal strength value and reflection location corresponding to each scan wave beam during the sweep, and assigns a set of mutually adjacent reflection locations as a segment. A corresponding range value of the segment is calculated, expressing an estimated distance of a detected object. A threshold value is derived in accordance with the segment range, a region of the segment in which the signal strength values exceed the threshold value is extracted, and the width of the extracted region is designated as the width of the detected object. [A1349]

"Utility mapping and data distribution system and method"

A system and method of mapping underground utilities and other subsurface objects involves one or more of acquiring utility location data using a number of different detectors and sensors, processing the multiple detector/sensor output data to produce mapping data, storing the mapping data in a database, and providing access to and use of the stored mapping data by subscribing users on a usage fee basis. [A1350]

"Vehicle collision avoidance system"

A collision avoidance system for a machine is disclosed. The collision avoidance system has a first obstacle detection system. The first obstacle detection system is configured to detect a first obstacle and generate a corresponding first signal. Additionally, the collision avoidance system has an operator interface. The operator interface has a display configured to communicate visual information to an operator. The operator interface also has an input device configured to receive selections from the operator and generate a corresponding second signal. In addition, the collision avoidance system has a controller. The controller is in communication with the first obstacle detection system and the operator interface. The controller is configured to control the display to provide a first dangerous obstacle warning to the operator, based on the first signal. The controller is also configured to control the display to provide a second dangerous obstacle warning to the operator, based on the first and second signals. [A1351]

"Radar vehicle detection system"

A radar parking detection system with a Ultra Wide Band (UWB) detection and transmission system including a hardened radar device placed in the vicinity of a parking space to be monitored by using measurements of time delays observed in the reflection of radio waves reflected from objects in the proximity of the transmitted waves and further including a hardened electronic sensor using (UWB) frequencies to determine the presence or absence of a vehicle in the parking space at close range, and a radio transmitter using multiple data transmission to limit the amount of lost data and to communicate changes in status of the parking space. [A1352]

"Ground surveillance segment detection radar performance analysis"

A method for ground surveillance radar performance analysis is disclosed. A vector of point data items indexed by time offset, and comprising a point probability of detection is received. A plurality of initial azimuths of a simulated radar signal of the radar tower is determined based on the radar field-of-regard. A plurality of initial azimuth segment probabilities of detection are calculated for each of the initial azimuths respectively based on the vector of point data items and the initial azimuths, and a segment probability of detection is determined based on the initial azimuth segment probabilities of detection. [A1353]

"Methods and apparatus for configuring a receiver"

Embodiments of the invention relate to configuring a receiver. In some embodiments, when a receiver is executing a dwell, configuration settings for one or more next possible dwells to be executed by the receiver may be sent to the receiver. In this way, when the receiver completes execution of the current dwell, the receiver need not wait to receive configuration settings for the next dwell to be executed as they may be already loaded into the receiver. [A1354]

"Sensitivity enhancement system"

Sensitivity is a critical aspect of weather radar systems. Such systems not only detect atmospheric patterns but often need to precisely measure weak precipitation echoes. Embodiments of the invention use pulse compression techniques to increase the sensitivity of weather radar systems. These techniques can include sending two waveforms into a region of interest, where the second waveform is designed based on knowledge about the first waveform. Such systems can enhance the sensitivity of weather radars about 10 dB. [A1355]

"Micro-radar, micro-radar sensor nodes, networks and systems"

A micro-radar is disclosed that is operated based upon two Digital to Analog Converter (DAC) outputs that control its internal timing and Intermediate Frequency (IF) signal frequency. Calibration and temperature compensation is done through estimating the duty cycle of the transmit signal and possibly the reception signal that stimulate a pulse generator to create the transmit pulse and the reception pulse and adjusting one or both DAC outputs. Sensor processors, wireless sensor nodes and wireline sensor nodes are disclosed for operating the micro-radar. An integrated circuit is disclosed implementing all or portions of the micro-radar. Access points, servers as well as systems that include but are not limited to a traffic monitoring system, a traffic control system, a parking management system and/or a production management system are also disclosed. [A1356]

"Radar device and rain/snow area detecting device"

A radar device is disclosed. The radar device includes a radar antenna, from which detection signals are transmitted while the radar antenna being rotated, the radar device generating a radar image from reflection waves of the transmitted detection signals, a reception module for receiving the reflection waves of the detection signals, an inclination calculating module for calculating an inclination of level of the received signals that continue in a predetermined direction, the inclination being a rate of change in the received signal level per predetermined range in the predetermined direction, and a rain/snow reflection determining module for determining whether the received signals are reflection signals from at least one of rain and snow by using the inclination calculated by the inclination calculating module. [A1357]

"System and method for providing scanning polarized reference sources"

A method of providing a polarized radio frequency scanning source is provided. The method including amplitude modulating at least two synchronized polarized radio frequency (RF) carrier signals with a predetermined relationship between their amplitude modulation of their electric field components and their polarization states to provide a scanning polarized RF reference source with a desired scanning range, pattern and frequency. The two or more synchronized polarized RF carrier signals with the predetermined relationship between their amplitude modulation can obtain a periodic or non-periodic scanning range, rate and frequency. [A1358]

"Device for monitoring the position of a tool or machine element"

In a device for monitoring the position of a tool or machine element on or in a work spindle or tool chuck, in particular, in a machining apparatus, the work spindle or tool chuck has at least one channel that defines a waveguide, which is suitable for propagating electromagnetic waves, that leads from an external surface of the work spindle or tool chuck to the tool or machine element. At least one radar system is provided and arranged outside the work spindle or tool chuck in such a manner that it is capable of irradiating a radar signal from the outer surface into the channel and or receiving a radar signal reflected back from the channel. The radar signal is connected to a signal-processing device that determines a measure of the position of the tool or machine element relative to the work spindle or tool chuck based on at least one radar signal irradiated into the channel and reflected back from the channel. [A1359]

"Weather radar and weather observation method"

A weather radar includes an antenna unit configured to transmit a radio wave from a plurality of antenna elements, and receive a reflected wave from a weather target by carrying out beam scanning in an elevation angle direction by phase control, a drive unit configured to control an elevation angle of an aperture of the antenna unit, and a controller configured to cause the antenna unit to carry out the beam scanning in a state where the aperture is faced to a point which presents a maximum range in the observational range by the drive unit, and direct, at a time point when the weather target is detected based on a received signal of the reflected wave, the aperture toward the weather target by the drive unit. [A1360]

"System and method for roll angle indication and measurement in flying objects"

A method for onboard determination of a roll angle of a projectile. The method including: transmitting a polarized RF signal from a reference source, with a predetermined polarization plane, receiving the signal at a pair of polarized RF sensor cavities positioned symmetrical on the projectile with respect to the predetermined polarization plane, receiving the signal at a third polarized RF sensor cavity positioned such that it receives a maximum signal at zero roll angle positioning, differentiating between up or down positioning of the desired roll angle position based on an output from a fourth sensor on the projectile, analyzing an output of the pair of polarized RF sensor cavities and the third RF sensor cavity resulting from the received signal and an output of the fourth sensor, generating a curve based on the output of the pair of polarized RF sensor cavities and the third RF sensor cavity indicating a relationship between roll angle and the third sensor output, and determining a roll angle positioning of the projectile based on the curve. [A1361]

"Electromagnetic scanning imager"

In one aspect, the present invention provides an imager, preferably portable, that includes a source of electromagnetic radiation capable of generating radiation with one or more frequencies in a range of about 1 GHz to about 2000 GHz. An optical system that is optically coupled to the source focuses radiation received therefrom onto an object plane, and directs at least a portion of the focused radiation propagating back from the object plane onto an image plane. The imager further includes a scan mechanism coupled to the optical system for controlling thereof so as to move the focused radiation over the object plane. A detector optically coupled to the lens at the image plane detects at least a portion of the radiation propagating back from a plurality of scanned locations in the object plane, thereby generating a detection signal. A processor that is in communication with the detector generates an image of at least a portion of the object plane based on the detection signal. [A1362]

"Pre-crash safety system"

A pre-crash safety system, which is not influenced by a false recognition that another vehicle is approaching and which causes the vehicle to conduct a safety measure operation when the possibility of a collision exists, is disclosed. The pre-crash safety system includes a collision prediction unit that makes the prediction of a collision between the vehicle and the another vehicle that has entered a monitoring area of the radar device, and a control unit that causes the own-vehicle to conduct the safety measure operation based on a result of the prediction of a collision by the collision prediction unit. The vehicle does not conduct the safety measure operation if, after the another vehicle has entered the monitoring area, a reflection point coordinate which represents a reflection point of a radar wave on the another vehicle is positioned within a predefined direction range when viewed from the vehicle. [A1363]

"Host-centric method for automobile collision avoidance decisions"

A method of quantifying a host vehicle's collision risk with a foreign object includes the steps of collecting and preserving a short-term history of range and azimuth data on the object and identifying leading edges of the foreign object. The leading edges are linked to previous detected leading edges in the short term history storage data to define a trajectory for the object, and to calculate range and azimuth velocities and accelerations of leading edges of the foreign object based on the leading edge trajectory. A collision risk P is then calculated for the foreign object using the range and azimuth velocities and accelerations according to a predetermined formula. If the collision risk P falls below a pre-set value, the methods of the present invention calculate an evasive maneuver for the host vehicle based on a vector sum of high risk leading edge risks and locations. [A1364]

"Virtual beam forming in ultra wideband systems"

Systems and methods include up-converting a UWB frequency pulse from a UWB radar unit to a V band frequency pulse, transmitting the V band frequency pulse via an active array antenna, receiving a V band echo pulse via the active array antenna, down-converting the V band echo pulse from the active array antenna to a UWB pulse, and feeding the UWB pulse to the UWB radar unit for processing by the UWB radar unit. A V band antenna system includes: an antenna board that defines an antenna plane being the plane of the board and comprising a plurality of antenna elements, a mother board providing a corporate combining feed to the antenna board, and a power management board to which the antenna board and mother board are mounted perpendicularly to the antenna plane, wherein the antenna elements provide a beam forming antenna for ultra wide band pulses at V band frequencies. [A1365]

"RTAWS active tower hazard detection system"

A system and method for a terrain awareness warning system. The system includes a radar system configured to transmit a first radio frequency wave and receive a second radio frequency wave, a display for receiving a display signal representative of an obstacle source and an obstacle source data circuit. The obstacle source data circuit includes an interface and a display circuit. The interface is coupled to the radar system and the display. The display circuit is configured to determine the obstacle source based on the second radio frequency wave and to transmit the display signal representative of the obstacle source. [A1366]

"System and method for enabling determination of a position of a transponder"

There is provided a method and system for positioning a transponder, the system comprising an antenna array of at least two spaced-apart antennas coupled to a common generating and switching unit. The generating and switching unit is configured for generating a periodic signal and switching the signal between said at least two antennas, constituting a positioning signal transmitted to the transponder. The system comprises a receiver for receiving a returned signal and a phase difference estimator coupled to the receiver and operable to measure phase differences between portions of the returned signal. The system further comprises a positioning utility coupled to said phase difference estimator and configured to determine the position of the transponder relative to the positioning system. [A1367]

"System and method for presenting wind speed information in a planar representation"

A system and method for presenting wind speed information in a manner so as to be easily understood and appreciated by viewers of televised weather report presentations and the like. Wind speed information is presented as a planar representation of three-dimensional wind speed data using contour lines, delineating areas with a planar location in the three dimensional data, overlaid on a geographic map display either alone, or in combination with radar reflectivity information. Wind velocity information received from a weather radar system, such as NEXRAD, relative to the weather radar is converted to absolute wind speed information for display. [A1368]

"System for determining relief on a granule filling surface in a petrochemical reactor"

The invention relates to a system for determining relief on a granule filling surface in a petrochemical reactor, the filling direction in which the reactor is filled defining a vertical direction, the reactor having a central vertical axis, the system including a transmitter configured to be positioned above the filling surface in such a manner as to transmit a signal to various points of said surface. The system includes shift means for shifting the transmitter about the central axis of the reactor through an angle that is great than 60.degree.. [A1369]

"Apparatus and method for determining axis deviation of radar"

A radar, mounted on a vehicle, emits electromagnetic waves to a side area of a vehicle and receives reflected electromagnetic waves to detect a distance and a bearing of a physical object. A speed of the vehicle is detected. When the vehicle speed is greater than a predetermined value, it is determined whether multiple reflection occurs based on at least distances detected by the radar. If it is determined that the multiple reflection occurs, an axis deviation of the radar is determined based on a difference between the detected bearing of the multiple reflection waves and a reference bearing. [A1370]

"Microwave/millimeter wave sensor apparatus"

A microwave/millimeter wave sensor apparatus including a planar radiation type oscillator substrate having an inner-layer GND interposed between a front surface side dielectric substrate and a rear surface side dielectric substrate and a pair of conductor patches in an axis-symmetric manner on the side of the front surface layer. A gate and drain of a microwave transistor are respectively connected to the conductor patches to supply power to the gate and the drain of the microwave transistor through a gate-side RF choke circuit and a drain-side RF choke circuit. An impedance line satisfying an oscillation condition is connected to a source and a transmit RF signal in an RF zone as a planar radiation type oscillator is transmitted and a receive RF signal as reflected waves is received from a measured object, thus obtaining an IF signal as the sensing information through homodyne mixing. [A1371]

"Model-based tomographic reconstruction"

A model-based approach to estimating wall positions for a building is developed and tested using simulated data. It borrows two techniques from geophysical inversion problems, layer stripping and stacking, and combines them with a model-based estimation algorithm that minimizes the mean-square error between the predicted signal and the data. The technique is designed to process multiple looks from an ultra wideband radar array. The processed signal is time-gated and each section processed to detect the presence of a wall and estimate its position, thickness, and material parameters. The floor plan of a building is determined by moving the array around the outside of the building. In this paper we describe how the stacking and layer stripping algorithms are combined and show the results from a simple numerical example of three parallel walls. [A1372]

"Adjustable pulse width ground penetrating radar"

A ground penetrating radar system is described that is able to create both low frequency, wide pulses, and high frequency, narrow pulses, to enable both deep and shallow operation of the ground penetrating radar on demand, including simultaneous operation. [A1373]

"Display device"

A display device includes a camera for capturing an image around a vehicle body, a monitor provided in a vehicle interior, and a display control unit for controlling a display of the monitor. The monitor has a rectangle-shaped display face, and is supported switchably between a vertically elongated posture and a horizontally elongated posture. When the monitor is switched to the vertically elongated posture, based on an image captured by the camera, the display control unit displays a top view image of a road surface around the vehicle body seen from above on the monitor. [A1374]

"Image processing device and vehicle detection device provided with the same"

A virtual vehicle which approaches to a monitor-side vehicle and a virtual background are defined in a camera image, and a region in which a virtual vehicle moves fast with respect to a virtual background is defined as a first region F1, and a region in which a virtual vehicle moves slowly with respect to a virtual background is defined as a second region F2. Then, the first region F1 and the second region F2 combined with an actual camera image. In the first region F1, in which the virtual vehicle moves fast, a monitored vehicle is detected by a movement aspect of feature portions in the region, and in the second region F2, in which the virtual vehicle moves slowly, a monitored vehicle is detected by pattern recognition. [A1375]

"Predictive and adaptive weather radar detection system and method"

A method of detecting weather on an aircraft uses a weather radar system. The method adapts the weather radar system in accordance with a time-of-year parameter, a time-of-day parameter, and/or a location parameter to remove ground clutter reflectivity. The method includes determining the particular parameter and automatically adjusting the weather radar system to display the weather in response to the parameter. The system can be implemented in hardware and/or software and can advantageously predict and identify weather and/or weather hazards more precisely. [A1376]

"Measuring the distance between devices"

First and second devices having clocks which may have different clock rates. Obtaining a measure of the distance of propagation of a signal passing between the devices involves transmitting a first signal 12 from the first device to the second device. After a turnaround time TAT, a second signal 14 is transmitted from the second device to the first device. Any error in the clocks may lead to an error in the measurement of the turnaround time TAT. One device contains circuitry to calculate the ratio of the clock rates of the first and second devices, either by adjusting frequency divider ratios until there is LO frequency match, or by determining the offset frequency of an envelope of a mixed signal. The ratio of the clock rates is used to compensate the turnaround time TAT, to mitigate error. The accurate distance measurement can be used to determine if a relay attack has taken place in a vehicle security system. [A1377]

"Systems and methods for space situational awareness and space weather"

Systems and methods for detecting objects and weather in space are disclosed. A system for detecting an object in space and space weather includes at least one spacecraft, at least one radiation source, at least one detector, and a controller. The at least one radiation source and the at least one detector are coupled to the at least one spacecraft. The at least one radiation source is configured to transmit a signal. The at least one detector is configured to detect the signal. The signal may be reflected from an object in space. The controller is coupled to the spacecraft and is in communication with the plurality of detectors. The controller is programmed to calculate either a relative position of the object based or a plasma parameter in a region traversed by the signal based on the detected signal. [A1378]

"Forward-looking detection radar"

An explosive detection system includes an unmanned vehicle and a manned vehicle. The unmanned vehicle includes a reflector. The manned vehicle includes a ground penetrating radar. The manned vehicle also includes electronics configured to process radar signals that are reflected by the reflector to detect an explosive device. The manned vehicle follows the unmanned vehicle. [A1379]

"Method for control of a device"

Control of a device including aiming a pointing device comprising a camera and a source of invisible light in the direction of an object associated with the device to be controlled, upon which object a number of retroreflective marker elements are positioned, which reflect at least a part of the invisible light emitted by the light source back to the pointing device, generating a first image of a target area aimed at by the pointing device whereby the light source is inactive, generating a second image of the target area aimed at by the pointing device whereby, invisible light is emitted by the light source in the direction of pointing, processing the target area images to determine the presence of retroreflective marker elements, using information pertaining to the retroreflective marker elements to identify the device to be controlled and/or to determine a control signal for the identified device. [A1380]

"Observation signal processing apparatus"

An observation signal processing apparatus transmits pulse signals as search signals per each search, generates observation values based on reflected signals against a target and delay modulation pulse signals, and performs coherent integration on the observation values to output an integration value. The apparatus includes a section for storing a coherent integration count, a section for transmitting pulse signals equivalent to the coherent integration count, a section for calculating a phase correction amount based on an estimated relative speed, and a section for performing phase-weighted coherent integration on the observation values based on the phase correction amount. [A1381]

"System and method for measurement of distance to a tag by a modulated backscatter RFID reader"

Distance to a modulated backscatter tag is measured with a RFID reader that measures changes in phase with frequency of modulated backscattered RF signals. Measured distances are linked to a specific tag. The effects of other sources of reflected and interfering signals are mitigated. The techniques eliminate the need for high RF bandwidth used in time-of-flight methods, and may be used with linear, limiting or other types of amplifiers in the reader receiver. Unambiguous distance to a tag may be found using the derivative of phase with RF frequency of the modulated signal backscattered by a tag. The distance to a tag can be measured with an accuracy on the order of a centimeter. The techniques utilize the characteristics of cooperative backscatter tags (transponders, labels, etc.) . New readers implement the techniques which may use unmodified tags. [A1382]

"Weather radar apparatus and rainfall rate calculation method"

According to one embodiment, a weather radar apparatus includes a transmitting/receiving unit configured to simultaneously transmit radar waves of a horizontally polarized wave and a vertically polarized wave and receive reflected waves, a signal processing unit configured to perform dual polarization observation based on a reception output from the transmitting/receiving unit and calculate a received power of each polarized wave, an observation parameter calculation unit configured to calculate, based on the received powers, a first observation parameter having a first spatial resolution, and a second observation parameter having higher correlation with a rainfall rate than that of the first observation parameter and a second spatial resolution lower than the first spatial resolution, and a rainfall rate calculation unit configured to synthetically determine the rainfall rate based on the first observation parameter and the second observation parameter. [A1383]

"Simplifying and cost-effective IR-RF combat identification friend-or-foe (IFF) system for ground targets"

Combined IR-RF combat identification friend-or-foe (IFF) system for a ground targets, such as dismounted soldiers, vehicles or military platforms comprising IR-RF interrogator mounted on a firearm and IR-RF transponder mounted on a friendly target. RF channel operates in Ka-band providing brief information about friendly targets that could be in attacked area, and if they are, develop alert signal: "Friendly soldiers are in the area". The interrogator additionally contains RF channel receiving reflected signal that allows recognize armed foe. IR channel of the system prevents friendly fire in the case of direct sighting to a friendly soldier. [A1384]

"Level sensing device"

A level sensing device with a high frequency radar system is provided. The radar system includes a radar high frequency module, a carrier board and a controller. The radar high frequency module is mounted on the carrier board using surface mount techniques. The controller includes a processor and the radar high frequency module has a plurality of components including one or more microwave integrated circuits, a radiating patch antenna, and coupling means for channeling a radiated signal from the patch antenna out of the module. The components are encapsulated to form the module and the coupling means includes a dielectric rod. [A1385]

"Direct-current blocking circuit, hybrid circuit device, transmitter, receiver, transmitter-receiver, and radar device"

The invention relates to a direct-current blocking circuit, and a hybrid circuit device, a transmitter, a receiver, a transmitter-receiver and a radar device that have the direct-current blocking circuit. A dielectric substrate (2) is provided with a conductor layer (3) disposed parallel with the dielectric substrate (2) , first and second planar lines (4, 5) each containing a part of the conductor layer (3) , and a waveguide (6) containing a part of the conductor layer (3) . The first and second planar lines (4, 5) are located on one surface (2a) side of the dielectric substrate (2) with respect to the conductor layer (3) , and the waveguide (6) is located on another surface (2b) side of the dielectric substrate (2) . In a transmission direction (X) of electric signals, as to the waveguide (6) , its one end overlaps with one end of the first planar line (4) , and its another end overlaps with one end of the second planar line (5) . In the overlapped regions, first and second through-holes (24, 25) are so formed as to penetrate the conductor layer (3) in its thickness direction. [A1386]

"Method and apparatus for the detection of objects using electromagnetic wave attenuation patterns"

A method, comprising: characterizing an electromagnetic radiation path based on at least a scattered electromagnetic radiation pattern resulting from propagation of electromagnetic radiation through the path, receiving a plurality of scattered portions of a modulated electromagnetic radiation at a plurality of receiver antennas, and processing, at a receiver, the plurality of scattered portions, in conjunction with the characterized electromagnetic radiation path, to determine a change in the electromagnetic radiation path over time. An apparatus comprises a transmitter which transmits modulated electromagnetic radiation along an electromagnetic radiation path subject to electromagnetic radiation scattering, a plurality of receiver antennas which receive scattered portions of modulated electromagnetic radiation, and a processor which analyzes respective scattered portions, to characterize the electromagnetic radiation path, and to determine a change in the scattered electromagnetic radiation path over time. [A1387]

"Methods and apparatus for non-isotropic sea clutter modeling"

Methods and apparatus to provide computing, using a processor, sea clutter threshold bias values as a function of range and azimuth, receiving a first shape corresponding to a first region of sea clutter about a radar, combining the sea clutter threshold bias values with the first shape to provide non-isotropic sensitivity time control (STC) for the radar, and outputting radar return for display with sea clutter suppressed in the first shape. [A1388]

"Method and device for determining a distance to a target object"

An apparatus and a method for determining a distance (r) to a target object (200) proposes transmitting electromagnetic waves in the form of a transmission signal (120a) by a transmitter (111a) , receiving at least one part of said transmission signal (120a) reflected by a the target object (200) in the form of a reception signal (120c, 120d) by receiving device (111b) and evaluating the reception signal (120c, 120d) according a reference signal

(1230b) which has a known phase difference with respect to the transmission signal (120a) and a frequency equal to the frequency thereof. The reference (120) and reception (120c, 120d) signal frequencies are reduced in a frequency divider (113) with the same predefined divider factor (x) while preserving the existing phase difference between the reference signal (120b) and the reception (120c, 120d) signal in such a way that a reduced frequency reception signal (120b') and a reduced frequency reception signal (120d) are obtained. The frequency difference between the reduced frequency reception signal (120b') and reduced frequency reception signal (120d') is evaluated in order to determine the distance (R) . [A1389]

"Bias estimation and orbit determination"

According to one embodiment, bias estimation and orbit determination include receiving measurements in real time. The measurements include radar measurements and radar array orientation measurements. The radar measurements are generated by a radar system and indicate the location of a target. The radar array orientation measurements are generated by a navigation system and indicate the orientation of a radar array of the radar system. A state variable set is used. The state variable set includes measurement variables and dynamic bias variables. for example, a state variable set may include orbit position, orbit velocity, radar orientation, and radar measurement variables, which in turn may include dynamic bias variables such as orientation bias variables and measurement bias variables. A measurement variable is associated with a measurement, and a dynamic bias variable is associated with bias of a measurement. The following are performed for a number of iterations to yield state value sets for the state variable set: updating a state value set according to the measurements to yield an updated state value set, and predicting a next state value set in accordance with the updated state value set. An orbit path is of the target determined from the state value sets in real time. [A1390]

"Radar apparatus"

A radar apparatus mounted in a vehicle includes an inward bent surface and a radar device. The inward bent surface is formed in a lower portion of a bumper of the vehicle, and curves inward with a higher degree of curvature in a horizontal plane than a bumper surface of an upper portion of the inward bent surface. The radar device is placed behind the inward bent surface so that a beam axis of the radar device penetrates the inward bent surface. [A1391]

"System for measuring turbulence remotely"

A method of predicting turbulence that may involve receiving electromagnetic energy that has traveled along a path subject to the turbulence, with the turbulence altering the electromagnetic energy. A determination may be made as to the alteration caused by the turbulence by filtering the electromagnetic energy as it was received with a velocity of one of a transmitter of the electromagnetic energy or a receiver that received the electromagnetic energy. [A1392]

"Mine detection"

An integrated mine detection system includes a ground penetrating metal detector and a ground penetrating radar detector. The integrated mine detection system includes an integrated search device housing a radio-wave transmitter of the radar detector and a coil of the metal detector. The radio-wave transmitter includes an antenna. The integrated search device includes a radio-wave receiver in the form of a pair of receiving antennas. [A1393]

"Systems and methods for secure supply chain management and inventory control"

Systems for encoding and reading RFID tags on a collection of items are shown. One embodiment of the invention includes a plurality of items, where each item possesses an item identifier string, and a plurality of RFID tags, where an RFID tag is affixed to each of the items and each RFID tag is encoded with a code word element generated using at least all of the item identifier strings. In many embodiments, the collection is a plurality of goods contained within a case, pallet, container or storage area. [A1394]

"Mobile sense through the wall radar system"

A method and apparatus for sensing a target through a wall or obstruction by a Moving Target Indicator (MTI) radar sensor. In an exemplary embodiment, a series of radar pulses are transmitted at frequencies less than about 5 GHz. Radar return signals are received at a plurality of receive antenna array subapertures. The radar return signals are processed by a digital beamformer to form multiple beams. Target detection processing detects moving and stationary targets through a plurality of parallel target detection signal processing paths. [A1395]

"Transmission scheduling for ADS-B ground systems"

System and methods for reducing redundant messages broadcast in an Automatic Dependent Surveillance-Broadcast (ADS-B) system. for a given target, a controller determines the relevant customers that should receive information about the target, identifies all of the ground stations that can be satisfactorily heard by the relevant customers, and then identifies a smaller subset of ground stations by selecting only those ground stations that are needed to reach all of the relevant customers. ADS-B messages are then broadcast to the relevant customers using only the smaller subset of ground stations. [A1396]

"Anti-mask motion sensor"

A motion sensing method and apparatus includes a housing enclosing a microwave motion sensor including an antenna, and a security system. The antenna may be a patch antenna which includes microwave radiating elements for transmitting and receiving a microwave signal for sensing motion. A reflector is attached to the housing and positioned above the antenna for downward shaping of the microwave signal. The microwave radiating elements together with the reflector provide a radiation pattern where a main beam is transmitted in a direction orthogonal to a surface of the antenna and a sided lobe is transmitted downward in amplitude below the microwave motion sensor. An alarm circuit indicates when the microwave sensor detects motion in armed mode, and a masking circuit indicates when the microwave sensor detects motion in a mask zone when the security system is unarmed. A second sensor may be positioned beneath the microwave motion sensor. [A1397]

"System and method for providing scanning polarized reference sources"

A method of determining an angular orientation of a sensor relative to a source including the steps of amplitude modulating at least two synchronized polarized Radio Frequency (RF) carrier signals with a predetermined relationship between their amplitude modulation of their electric field components and their polarization states to provide a scanning polarized RF reference source with a desired scanning range, pattern and frequency, detecting the scanning polarized RF reference source at the sensor, and determining the orientation of the sensor based on the detected scanning polarized RF reference source. Similar methods are also provided for determining an angular orientation and/or position of a sensor relative to two or more sources, aligning a mobile sensor relative to a source and homing a sensor relative to a predetermined plane and/or point. [A1398]

"Gaussian model adaptive processing in the time domain"

Embodiments of the present invention provide a Gaussian adaptive filter for ground clutter filtering and signal parameter estimation for weather radars in the time domain. In some embodiments, the filtering can be applied to dual polarization radar systems. In some embodiments, the clutter component of the signal can be transformed to noise. An interpolation procedure can then be used to recover the transformed part of the weather. A unique filter can be designed to use for both H and V channels for dual-polarization parameter estimation. In addition, the filter can be directly extended for staggered PRT 2/3 sampling scheme. [A1399]

"Signal processing device, radar device, vehicle control device, and signal processing method"

In order to prevent delays in output of detection results, even when a plurality of frequency modulation methods with different frequency change rates are used, an FM-CW radar device employing frequency modulation with two different frequency change rates, has distance/velocity detection unit for detecting the relative distance or relative velocity of a target object based on beat signals of transmission signals with the same frequency change rate and for detecting the relative distance or relative velocity using beat signals when the frequency change rates are different, and distance/velocity confirmation unit for adding evaluation values for relative distances or relative velocities detected in the detection processing, and for confirming the relative distance or relative velocity based on the evaluation value which has reached a criterion value. As a result, more data can be obtained in one detection cycle, and the same advantageous results as when executing a plurality of detection cycles can be obtained. Consequently, delay of output of detection results from the radar device to a vehicle control device can be prevented. [A1400]

"System and method for radiating RF waveforms using discontinues associated with a utility transmission line"

A method for processing radio frequency reflections is provided. The method applies an RF waveform to a transmission line that is a conductor used for providing a utility service. The method uses a RF waveform generator to transmit UltraWideband (UWB) RF waveforms through the conductors of a building. The RF waveforms are emitted at emission points that can be impedance discontinuities along the transmission line or impulse radios. The emitted RF waveforms reflect off of objects in the building and are received at reception points that can be impedance discontinuities or impulse radios. These reflections are processed to determine movement of objects within or near the building. Based on the reflections of the RF waveforms, the position of the objects within or near the building can be determined. [A1401]

"Proximity sensor for a parking area"

A proximity sensor for a parking area designed to detect the presence of an obstacle constituted by a parked vehicle, comprises a transmitting radar, designed to send electromagnetic pulses towards the obstacle, a receiving radar, designed to receive the pulses reflected by the obstacle, and a processing circuit, designed to compare samples detected in a certain condition of absence of an obstacle in a calibration step with those detected in a condition of detection of an obstacle to determine the presence/absence of the obstacle. [A1402]

"Close-spaced leader-follower navigation using control mimic"

A method is provided for automatically controlling a first vehicle (follower vehicle) that is to follow a second vehicle (leader vehicle) in a desired manner with respect to movement of the second vehicle. In the follower vehicle, bearing and acceleration control inputs are generated based on data representing bearing and acceleration control inputs made at the leader vehicle and a position of the follower vehicle relative to the leader vehicle so as to mimic in the follower vehicle the bearing and acceleration control inputs made in the leader vehicle. Adjustments may be made to the control inputs applied in the follower vehicle based on deviation between the velocity of the follower vehicle and velocity of the leader velocity, and on deviation between estimated (actual) follow distance and lateral offset and target follow distance and lateral offset between the follower vehicle and the leader vehicle. [A1403]

"Method for filtering sea clutter in a radar echo using a hydrographic model"

There is disclosed a method for filtering sea clutter in a radar echo using a hydrographic model. The method comprises the steps of determining parameter values of the hydrographic model using the radar echo, estimating the sea clutter corresponding to the sea surface as deduced from the hydrographic model and filtering of the estimated sea clutter from the radar echo. [A1404]

"Conductive line communication apparatus and conductive line radar system and method"

A conductive line radar comprising at least one signal surface wave launcher, which comprises a signal surface wave transceiver, which is physically attached to a power line. The signal surface wave transceiver transmits a wave signal along the power line with another signal radiating from the wave signal in a plurality of directions along the power line. The at least one signal surface wave transceiver receives reflected signals from a target within a distance of the power line. The at least one signal surface wave launcher includes at least one RF communications transceiver and can be inductively powered from the power line. [A1405]

"Apparatus and process for vehicle driving assistance"

A vehicle driving assistance apparatus includes a brake operation sensing device to sense a driver's brake operation, a steering operation sensing device to sense a driver's steering operation, a forward, and a controller. The controller is configured to determine whether there is a need for avoiding the obstacle, by examining a possibility of contact of the vehicle with the obstacle, and to produce a yaw moment to an obstacle avoiding direction advantageous for avoiding the obstacle, from the time of detection of the driver's brake operation, to the time of detection of the driver's steering operation, by adjusting a wheel brake/drive force distribution among wheels resulting from the driver's brake operation when there is the need for avoiding the obstacle. [A1406]

"Object detection"

An object is detected by generating a m-ary primary signal having an irregular sequence of states. Each transition results in the transmission of a pulse encoded according to the type of transition. Reflected pulses are processed with a delayed, reference version of the primary signal. The presence of an object at a range corresponding to the delay is determined from the extent to which the reflected pulses coincide with transitions in the reference signal. In one aspect, transitions between states of the primary signal occur at varying time offsets with respect to nominal regular clock pulses. In another aspect, the object-detection system is operated while inhibiting the transmission of pulses, and if a significant output is obtained, the parameters of the transmitted signal are altered. [A1407]

"Method and apparatus using non-contact measuring device to determine rail distance traveled"

A non-contact, distance traveled measurement system (DTMS) to calculate speed and distance traveled by a vehicle over rails--more specifically, by trains traveling on standard railroad tracks. Preferably, a pair of short range (near field) microwave-based transmitters/sensors (transceivers) are mounted on the underside of the train and used to key on rail-bed features such as cross ties or tie plates. Preferred embodiments also include infrared sensors as a redundant channel that is less sensitive to moisture in the track bed. Data from the sensors is correlated to determine the time delay between the first and second sensors' passage over objects on the rail bed such as cross-ties or tie-plates. From this time delay, nearly instantaneous velocity can be computed at each given target such as a tie plate (metal target) or a tie (dielectric contrast target) . Velocity versus time curves can be integrated over time to derive distance traveled. [A1408]

"In-vehicle radar device and cover for in-vehicle radar device"

Provided is an in-vehicle radar device and a cover for the in-vehicle radar device which are capable of accurately detecting an object. The in-vehicle radar device radiates electromagnetic waves and receives reflected waves, from the object, of the electromagnetic waves so as to detect a location of the object, and includes: a transmission-and-reception section that transmits the electromagnetic waves and receives the reflected waves, a detection section that detects the location of the object based on the reflected waves, and a cover member that covers the transmission-and-reception section in a manner that a rear surface of the cover member faces a transmission-and-reception surface of the transmission-and-reception section, and the cover member includes: a cover portion that covers the transmission-and-reception surface, and a lower protrusion portion that is provided below the cover portion and formed so as to protrude on a surface side of the cover member with respect to the cover portion, the cover portion being formed of a material through which the electromagnetic waves are transmitted. [A1409]

"Adaptive sidelobe blanking for motion compensation"

A motion compensation method and system is included in a radar antenna system mounted on a moving platform which is subject to pitch, yaw and roll. The radar antenna system includes a main array antenna, and an auxiliary antenna. The auxiliary channel associated with the auxiliary antenna utilizes roll, pitch and yaw angle motion compensations as its auxiliary antenna always steers a horizontal fan shape beam at the horizon to blank any surface (land or sea) based EM interferences. Such motion compensations are provided by a ship motion compensator component and process included within the antenna system. The ship motion compensator component in response to platform motion signals indicative of changes in platform motion angles generates new sets of values using an initial set of weighting coefficient values as a function of such angle motion changes. This produces changes in both amplitude and phase weighting coefficient values which results in both the quadrant phase rotation and the element weighting rotation. The process steers and spreads out the received auxiliary antenna pattern making sidelobe coverage broad enough to compensate for such changes in platform motion. [A1410]

"Systems and methods for gaussian decomposition of weather radar data for communication"

Exemplary methods and systems provide for processing weather data received from a weather radar system. An exemplary embodiment receives radar reflectivity data, decomposes the received radar reflectivity data into multiple adaptive Gaussian component functions, selects at least one parameter from the decomposed Gaussian component functions, generates the compressed weather radar display data based on the at least one selected parameter, and communicates the weather radar display data from the craft. [A1411]

"Unattended ground sensor system and methods"

A High Performance Unattended Ground Sensor (HiPer-UGS) system and methods comprising low-power fully functional and independent radar-nodes that communicate directly with a remote radar information gathering or relay point using a long distance communications transceiver co-located in the radar-node. [A1412]

"Vehicular traffic surveillance doppler radar system"

A vehicular traffic surveillance Doppler radar system and method for use of the same are disclosed. In one embodiment, the system comprises a modulation circuit portion for generating modulated FM signals. An antenna circuit portion transmits the modulated FM signals to a target and receives the reflected modulated FM signals therefrom. A ranging circuit portion performs a quadrature demodulation on the reflected modulated FM signals and determines a range measurement based upon phase angle measurements derived therefrom. [A1413]

"Tracking air and ground vehicles"

In one aspect, an air and ground vehicle tracking system includes a base station configured to transmit locations of air vehicles to a radio and a GPS receiver disposed in a ground vehicle and configured to derive a location of the ground vehicle. The radio is configured to receive locations of air vehicles, receive locations of other ground vehicles and broadcast a location of the ground vehicle to the base station. The system also includes a display configured to render locations of the air and ground vehicles. [A1414]

"Method for processing measured vertical profiles of the power of the echoes returned following a transmission of radar signals"

The method processes measured vertical profiles of the power of the echoes returned following a transmission of radar signals, each measured vertical profile being a function of the sweep angle of the radar beam and associated with a given pointing angle/distance box pair of the radar beam. The method generates a synthetic vertical profile of the power of the echoes returned by the ground only, and includes, for each measured vertical profile: superposition of the synthetic vertical profile on the measured vertical profile in question, for various values of the sweep angle, calculation of the error that exists between the measured vertical profile and the synthetic vertical profile, for each sweep angle value in question, and an exclusion, from the measured vertical profile, of the values for which the calculated error is less than a given threshold, in order to generate a resultant vertical profile with no ground echoes. [A1415]

"Map information update support device, map information update support method and computer readable recording medium"

A map information update support device includes a communication interface unit that acquires plural items of radar image data of the same observation area acquired at different times, respectively, a registration processing unit that registrates the plural items of radar image data with respect to one another, a characteristic value calculation unit that calculates a characteristic value representing a state of a surface of the earth in the observation area using the items of radar image data after the registration process, a feature changed area extraction unit that extracts a feature changed area based on the characteristic value, a road change candidate area extraction unit that synthesizes the feature changed area with map information of the observation area and extracts a road change candidate area that is a candidate of a road changed portion, and an output unit that outputs the map information synthesized with the road change candidate area. [A1416]

"GPS navigation code system"

A GPS navigation code device has GPS features and easy address retrieval means built in, enabling a driver to retrieve and request directions to an address without taking his eyes off the road. The user pre-programs the GPS navigation code device with a plurality of addressees or points of interest and assigns unique navigation codes for each as keyboard entry and speech, all stored in local database within the GPS in three linked databases. While driving, the user presses a special address search mode key and inputs the unique navigation code by keyboard or speech pattern, views displayed address and accepts the same. When an unknown navigation code is entered the GPS accesses a remote database through the Internet to recover the associated company name and uses Internet based map service to locate closest list of specified business providing directions by map and speech on a turn-by-turn basis. [A1417]

"Method of preventing false detections in sensors"

Described herein is a method of preventing false detections in sensors pulse-Doppler radar mounted on a moving platform. The method comprises filtering each received burst using Doppler filtering to split each received burst into at least a fast channel and one or more slow channels. The slow channel outputs are then used to derive compensation values for the fast channel. In particular, a zero Doppler slow channel is used to derive predicted surface clutter residue information, and a near zero Doppler slow channel is used to derive additional false alarm control attenuation information. Both the predicted surface clutter residue and the false alarm control attenuation information is used to apply compensation to the fast channel and a comparison is done to select the lower of the two values to generate an output signal. [A1418]

"Microwave system utilizing elevational scanning by frequency hopping"

For use in conjunction with a microwave antenna having a radiator array configured to scan in a horizontal direction, a method for scanning in the vertical direction. A first FMCW microwave signal having a first bandwidth is transmitted at a first microwave frequency and the echo, if any, is received by the radiator array. A second FMCW microwave signal having a second bandwidth is also transmitted at a different center frequency and the echo, if any, is received by the radiator array. The different frequencies cause an elevational shift in the received signal. The receipt of the echoes is then processed to identify the location or locations of the object or objects causing the echo and communicating such location or locations to a user. [A1419]

"Driver assistance system and method for checking the plausibility of objects"

In a method for checking the plausibility of objects in driver assistance systems for motor vehicles is described, two measured variables are derived from position data from two object position-finding systems of the vehicle that operate independently of one another, for an object located by the two position-finding systems, one variable for each position-finding system, these variables representing one and the same physical parameter, and the two measured variables are then checked for consistency, which is characterized by the fact that the parameter is the time to collision of the vehicle with the object, which is calculated in advance. [A1420]

"Method of eliminating ground echoes for a meteorological radar"

The present invention relates to a method of eliminating ground echoes for a meteorological radar. The ground echoes being received from a predetermined area by a radar, the radar illuminating, for a predetermined number R of transmission recurrences, the area over a number P of distance cells, the method includes a step for calculating a spatial statistical parameter of the cluttered echoes received by the radar in response to the recurrences over an analysis path for distance cells, and a step to compare the spatial variation level of the spatial statistical parameter along the analysis path, the echoes being considered to be ground echoes when the level of said variation is greater than a predetermined threshold. [A1421]

"System and method for inspecting a wind turbine blade"

A wind turbine blade inspection system includes a frequency modulated continuous wave radar system configured to be movable with respect to a wind turbine blade while transmitting reference microwave signals and receiving reflected microwave signals and a processor configured for using a synthetic aperture analysis technique to obtain a focused image of at least a region of the wind turbine blade based on the reflected microwave signals. [A1422]

"Mobile communication terminal and moving speed detection method for the same"

A mobile communication terminal and a moving speed detection method which are capable of detecting a moving speed with high accuracy are provided. A mobile communication terminal 10 includes a plurality of moving speed detector sections, i.e., a first moving speed detector section 30 and a second moving speed detector section 32 which have mutually different detection methods and a speed detection value selector section 34 to select any one of respective speed detection values of the detector sections 30 and 32 based on a predetermined selection criterion. [A1423]

"Self-oscillating UWB emitter-detector"

A UWB RF detector employs a pulsed self-oscillating mixer (SOM) and an output integrator to provide low-noise preamplification, mixing and sampling. The SOM produces short-burst, microwave self-oscillations that are phase-locked to a clock. The self-oscillations are used for mixing. The SOM can also radiate UWB RF pulses. A one-transistor SOM can simultaneously implement both a UWB emitter and a UWB detector in a radar transceiver. A control loop can stabilize the self-oscillations at nanowatt levels. Nanowatt UWB radars and radios can be realized, thereby opening new spectral bands beyond those formally designated for UWB operation. [A1424]

"Method of verifiably detecting the speed of a vehicle"

A method of measuring the speed of a vehicle wherein the speed and the distance of the vehicle from a radar system and/or the measuring angle of the vehicle relative to the radar axis is determined by means of a radar measurement so as to characterize or determine the vehicle lane of the vehicle by means of the distance and/or the measuring angle. Knowledge of the vehicle lane makes it possible to unequivocally identify the detected vehicle in a group of vehicles unequivocally. [A1425]

"Vehicular radar device"

Provided is a vehicular radar device which is capable of reducing an operation resource quantity necessary for a process of estimating an axis deviation angle in a radar measurement coordinate system, to thereby reduce a device size. The vehicular radar device includes: a measurement unit that measures an azimuth angle and a relative Doppler velocity, an extraction/accumulation unit that extracts target information satisfying conditions related to the relative Doppler velocity, a travel speed and a turning velocity, and accumulates the azimuth angle and a velocity ratio obtained by dividing the relative Doppler velocity by the travel speed of the subject vehicle among the extracted target information, and an axis deviation angle estimate unit that reads the target information accumulated in the extraction/accumulation unit, and estimates an axis deviation angle of the measurement coordinate system of a radar based on a second-order polynomial expression of the azimuth angle of the target. [A1426]

"Object detecting apparatus for vehicle"

An object candidate position detecting apparatus which detects a position of an object candidate includes a unifying mechanism which unifies a plurality of object candidates detected within a predetermined unified range into a single group. Where the relative positions of the object candidates stored in a unified information storage device changes such that the single group splits into a plurality of groups, a tracking mechanism judges whether any object candidate forming the group before the split continuously remains to be detected in a running lane in which a subject vehicle runs and which is estimated by a running lane estimator. Where any object candidate forming the group before the split is determined as continuously remaining to be detected in the running lane, the tracking mechanism determines that there is continuity between a group after the split including the thus-determined object candidate and the group before the split. [A1427]

"Highway speed ground penetrating radar system utilizing air-launched antenna and method of use"

Embodiments of the disclosed technology comprise an air-launched antenna system with interference-rejection technology that operates in analog hardware as well as by way of a digital filtering technique. Using an inline analog hardware filter combined with a digital filter, to determine transversal (and/or recursive) coefficients, in a calibration phase, a measurement system may be configured to remove interference and the effects (such as a delay or temperature variation) which result from use of an analog filter. In this manner, the resulting measurements of a composition of road surface are more accurate and useful. [A1428]

"RFID detection and identification system including an RFID reader having a limited transmit time and a time-out period to protect a medical device against RFID-associated electromagnetic interference"

A system is provided for identifying implanted medical devices, leads and systems, as well as objects in close proximity to a patient having an implanted active medical device, using a radio frequency identification (RFID) tag having retrievable information relating to the AIMD, lead system and/or patient. An RFID tag communicator includes a circuit for limiting the total continuous transmit time of an interrogation signal, and a time-out circuit for delaying a second and any subsequent interrogation of the RFID tag. [A1429]

"Method for targeting a preferred object within a group of decoys"

Current targeting approaches involve guiding to a spatially derived guidepoint of a group of objects likely to be the preferred object. This method may not allow the intercepting missile to contain the preferred, or other probable object (s) , within its divert capability. The guidepoint is shifted closer to the preferred object using specific energy and angular momentum, constants of orbital motion, which describe properties of an object's trajectory. Guiding to the specific energy derived guidepoint does not offer significant benefit over guiding to the spatially derived guidance point. However, computing the spatial rate of change of specific energy within the plane formed by the guidance objects establishes a vector pointing close to the preferred object. This is the direction to shift the guidepoint in order to contain the preferred object within the interceptor's divert capability. [A1430]

"Method and system for collision avoidance"

A method for collision avoidance for a host vehicle includes the following steps, receiving input data relating to a set of objects external to the host vehicle, wherein an object position (r,.PHI.) , and an object velocity ({dot over (r) }) are associated with each object by a sensor system arranged on the host vehicle, then estimating future trajectories of each external object, while considering influence by the future trajectories of the other external objects. [A1431]

"Surveillance system and method"

A passive system is described for detecting radar emissions from vessels, receiving the radar emissions and analysing the data using a series of algorithms and software manipulation to extract radar signatures representative of the identity of the vessel. The data output is capable of comparison with a stored set of data enabling accurate identification of the vessel. The resulting output is displayed on a suitable display. A system having a library of vessel emission signatures can either be created within the operator's library through measurement made, or it can be supplied from a central database. The system is capable of installation on sea, land or air-based platforms. [A1432]

"Method of estimating the elevation of a ballistic projectile"

The present invention relates to a method enabling precise determination of the elevation of a projectile following a ballistic trajectory by use of a conventional Doppler surveillance radar. The method includes calculating first the estimate {circumflex over (.GAMMA.) }.sub..rho. of the value of the radial component .GAMMA..sub..rho. of the acceleration of the projectile from the quantities {dot over (d) } and {umlaut over (d) }, respectively representing the first derivative and the second derivative with respect to time of the Doppler velocity d of the projectile, then calculating the estimate {circumflex over (V) } of the speed V of the projectile from d, {dot over (d) } and {circumflex over (.GAMMA.) }.sub..rho., and finally calculating the estimate E of its angle of elevation E from d and {circumflex over (V) }. The method according to the invention may apply to the protection of sensitive areas against the firing of ballistic projectiles. [A1433]

"Radar apparatus, and measurement method used in the radar apparatus"

The present invention provides a radar apparatus capable of changing a characteristic of filter processing while considering also a relative velocity of an object. A measurement section measures a relative position and a relative velocity of an object such as another vehicle, a pedestrian, and an object placed on a road. The radar apparatus calculates a time until the object and an own vehicle collide with each other, based on the relative position and relative velocity of the object measured by the measurement section, and changes, based on the calculated time, a filter coefficient to be used when filter processing is performed on a measured position converted from the measured relative position of the object, thereby changing a characteristic of the filter processing to be performed on the measured position, between stability and responsiveness. [A1434]

"Method for distance measurement and data transmission in a continuous wave radar system"

A method for distance measurement and data transmission in a continuous wave radar system is described. A continuous wave radar system has a transmit and receive module and at least one transponder device, a mobile control and monitoring device and an HMI system. Transponder devices are searched for with the aid of an unmodulated continuous wave signal as an interrogation signal, such that the transponder device can send a radio response signal to the transmit and receive module in response to the interrogation signal, as a result of which a data transmission takes place from the transponder device to the transmit and receive module. Upon completion of the data transmission a frequency-modulated continuous wave signal is generated in order to measure, on the basis thereof, a distance between the transponder device and the transmit and receive module. [A1435]

"Ultra-wideband radar waveform calibration for measurements of a heterogeneous material"

Embodiments of the disclosed technology comprise a ground penetrating radio device and methods of use for obtaining greater resolution. This is achieved by measuring the composition/reflection off a homogeneous material (e.g., metal plate) , determining coefficients to correct the measured/reflection in order to make the measurements look like an idealized reference signal, and then using these coefficients in a digital filter to correct measurements/a reflection off a heterogeneous material, such as a road surface. In this manner, the composition of the heterogeneous material is determined with greater accuracy. [A1436]

"Digitally controlled UWB millimeter wave radar"

An ultra wide band (UWB) millimeter (mm) wave radar system includes a signal source having a control input, a GHz signal output and a frequency controlled output. A control loop is coupled between the GHz signal output and the control input including a frequency divider and a digitally controlled PLL that provides a locked output coupled to the control input of the signal source to provide frequency locked output signals that are discrete frequency swept or hopped. A frequency multiplier is coupled to the frequency controlled output of the signal source for outputting a plurality of mm-wave frequencies. An antenna transmits the mm-wave frequencies to a surface to be interrogated and receives reflected mm-wave signals therefrom. A mixer mixes the reflected mm-wave signals and mm-wave frequencies and processing circuitry determines at least one parameter relating to the surface from the mixing output. [A1437]

"System for distinguishing among radar returns using information from a database"

A terrain awareness system includes a processor for receiving radar returns and providing terrain and/or obstacle alerts or warnings in response to the radar returns. The processor receives information from a database and the information is used to select the radar transmit function and/or the radar reception function to optimize the performance of the system. [A1438]

"Electronic curtain for vehicle protection"

An apparatus and method for protecting against incoming projectiles comprising transmitting two radar waveforms, the first waveform comprising a pulsed continuous wave waveform, and the second waveform comprising a pulsed linear chirp waveform over a bandwidth, and based on returned radar data, causing deployment of a defense mechanism to intercept a detected incoming projectile. [A1439]

"Weather radar system and method using dual polarization antenna"

An antenna system for a weather radar system includes a first transceiver and a second transceiver. The polarization of the first transceiver is orthogonal to the polarization of the second transceiver. The first transceiver and the second transceiver are interlaced to occupy the same volume. [A1440]

"Method of characterizing the convection intensity of a cloud, by a meteorological radar"

The present invention relates to a method of characterizing the convection intensity of a cloud by a meteorological radar. The reflectivity of said cloud to an electromagnetic wave being distributed in space, the distribution of the reflectivity being discretized according to a network of points (i, j, k) of the space in three dimensions, at least one profile (22) is defined as a normalized function of a parameter (21) , which is in turn a given numeric function in two dimensions (i, j) of the distribution of the reflectivity at each point of the network, said normalized function varying uniformly between a minimum constant value and a maximum constant value, the function being equal to the minimum value when the parameter is less than a low threshold (threshold min) and being equal to the maximum value when the parameter is greater than a high threshold (threshold max) , the cloud being characterized as convective when the profile is equal to one of the constant values and as stratiform when it is equal to the other constant value. The invention applies notably to meteorological radars on board aeroplanes. [A1441]

"Millimeter and sub-millimeter wave portal"

In accordance with one embodiment of the present invention, a millimeter or sub-millimeter wave portal system is provided. Generally, the portal system comprises an electrooptic source and one or more millimeter or sub-millimeter wave detectors. The electrooptic source comprises an optical signal generator, optical switching and encoding circuitry, and one or more optical/electrical converters. Additional embodiments are disclosed and claimed. [A1442]

"Method for determining the angular aperture corresponding to the extent in a plane of an object seen by a radar antenna"

The present invention relates to a method for determining the angular aperture corresponding to the extent in a plane of an object seen by a radar antenna, the object being situated at a given distance from the radar antenna. Echoes are measured in directions .theta..DELTA..theta..times..times..times..times..theta..DELTA..theta. ##EQU00001## of the plane, where .theta..sub.p is a variable angle corresponding to directions of the plane and .DELTA..theta. is a given angular aperture. The pairwise differences are calculated between the echo measurements taken in the directions .theta..DELTA..theta..times..times..times..times..theta..DELTA..theta. ##EQU00002## The slope is determined at a value .theta..sub.p of a function e of .theta..sub.p interpolated between the calculated differences, the angular aperture which corresponds to the extent of the object at the given distance being deduced from the slope. The invention has an application in meteorological radar. [A1443]

"Sensor cart positioning system and method"

A movable platform has a front end, a back end, a longitudinal axis, and at least one axle oriented generally transverse to the longitudinal axis and located between the front and back ends for supporting wheels of the platform. A position sensor is affixed on the platform at a location other than at a location defined by a plane passing through the axle and normal to the longitudinal axis. The position sensor provides position data as the platform traverses a path. A sensor arrangement is supported by the platform and configured to provide subsurface sensor data as the platform traverses the path. A processor is configured to associate the position data with the sensor data relative to a reference frame and in a manner that accounts for dynamic motion of the platform. [A1444]

"Close-spaced leader-follower navigation using control mimic"

A method is provided for automatically controlling a first vehicle (follower vehicle) that is to follow a second vehicle (leader vehicle) in a desired manner with respect to movement of the second vehicle. In the follower vehicle, bearing and acceleration control inputs are generated based on data representing bearing and acceleration control inputs made at the leader vehicle and a position of the follower vehicle relative to the leader vehicle so as to mimic in the follower vehicle the bearing and acceleration control inputs made in the leader vehicle. Adjustments may be made to the control inputs applied in the follower vehicle based on deviation between the velocity of the follower vehicle and velocity of the leader velocity, and on deviation between estimated (actual) follow distance and lateral offset and target follow distance and lateral offset between the follower vehicle and the leader vehicle. [A1445]

"Polarization-modulated transmitter for a weather radar"

Polarization modulated transmitter, in particular for a weather radar, with at least two signal paths (3, 4) to which a radio frequency signal can be fed, and which are connected to a coupler (8) , and with a phase modulation of the signal to be emitted via the antenna (1) , it being possible to feed the same radio frequency signal to the at least two signal paths (3, 4) respectively having at least one transmit amplifier (5, 6) , and a polarization modulator (7) is arranged for the phase modulation in one of the at least two signal paths (3, 4) in such a way that a radio frequency signal can first be phase modulated and then amplified. [A1446]

"Ground collision instrument for aircraft and marine vehicles"

Radar return processing systems and methods are operable to process radar information when an installation vehicle is operating in proximity to a surface area of interest. An exemplary embodiment reduces energy of an output pulse emitted from a radar system, receives a plurality of radar returns from a plurality of objects that reflect the reduced energy output pulses emitted from the radar system, determines a surface area of interest based upon at least a current location of the installation vehicle, and filters the radar returns generated by objects that are located outside of the surface area of interest. Optionally, some systems and methods may reduce a sweep range of an antenna from which the reduced energy output pulses are emitted. [A1447]

"Object verification method for use in radar systems for motor vehicles"

In an object verification method for use in radar systems for motor vehicles, the distances and relative velocities of located objects are determined on the basis of received radar echoes. The signature of multiple reflections is searched for in the received radar echoes to verify real objects. [A1448]

"Organically reactive cell for underground sensing (ORCUS) and system"

A movement detection system includes a microwave antenna able to transmit microwave frequency signals into a space. An electronics controller is connected to the microwave antenna, and is configured to continually measure the impedance of the microwave antenna while it transmits microwave frequency signals into the space. An interpretive device is connected to receive impedance measurements from the electronics controller, and is configured to interpret and report changes in the magnitude and phase angles of individual impedance measurements as the passing of things and their direction through the space. [A1449]

"Methods and systems for detection of hazard to aviation due to convective weather"

Systems and methods for improving output of weather information. A weather radar system receives weather reflectivity values. A processing device stores the received weather reflectivity values into a three-dimensional buffer, calculates a sum of the reflectivity value stored in a column of cells within the three-dimensional buffer, and assigns a first hazard indication to the cells of the column when the result of the calculation is above a first threshold. A display device generates a weather display based on data stored in the three-dimensional hazard indication when a cell from the three-dimensional buffer has been selected for the weather display. [A1450]

"Method for determining the plausibility of objects in driver assistance systems"

A method for determining the plausibility of objects in driver assistance systems of motor vehicles includes the steps of statistically analyzing the lateral offsets (Y) of stationary objects to detect left and right roadway boundaries, analyzing the lateral offsets (Y_H) of moving objects to detect any adjacent lanes, calculating a probability value Q_R that the host vehicle is in the extreme right traffic lane of the roadway and a probability value Q_L that the host vehicle is in the extreme left traffic lane, and varying the width and/or lateral position of the travel route envelope as a function of the probability values Q_R and Q_L. [A1451]

"Multistatic concealed object detection"

Concealed object detection using electromagnetic and acoustic multistatic imaging systems and methods. A method of simultaneously screening plural subjects for concealed objects includes transmitting a signal into a screening area where there is at least one subject to be screened having an associated object, receiving a reflected signal from the object when the object is located within the screening area, processing the reflected signal using multistatic Fourier space sampling and tomographic reconstruction to generate a three-dimensional image of the object and displaying the three-dimensional image. The transmitting and receiving are performed using a multi-directional array including at least three sensors. An object detection system includes a screening area, a multi-directional array including at least three sensors, a processor configured to execute multistatic Fourier space sampling and tomographic reconstruction and a display. [A1452]

"Probabilistic lane assignment method"

An improved probabilistic lane assignment method for detected objects in the scene forward of a host vehicle. Road/lane model parameters, preferably including an angular orientation of the host vehicle in its lane, are estimated from host vehicle sensor systems, taking into account measurement uncertainty in each of the constituent parameters. A probabilistic assignment of the object's lane is then assessed based on the road/lane model parameters and object measurements, again taking into account measurement uncertainty in both the road/lane model and object measurements. According to a first embodiment, the probabilistic assignment is discrete in nature, indicating a confidence or degree-of-belief that the detected object resides in each of a number of lanes. According to a second embodiment, the probabilistic assignment is continuous in nature, providing a lateral separation distance between the host vehicle and the object, and a confidence or degree-of-belief in the lateral separation distance. [A1453]

"Location systems and methods"

A method of calculating the position or state of motion of one or more terminals is proposed in which each has a receiver capable of making measurements of signals received from one or more transmission sources for use in calculating the unknown position or state of motion of the or each terminal. At least one transmission source has a known directional transmission pattern, and the bearing from one of the receivers of the or each of the transmission source having a known directional transmission pattern is estimated. Weights are assigned to the measurements made by the one receiver, the weights being calculated from the bearing or bearings and the known directional transmission pattern of the transmission sources. [A1454]

"Systems and methods for antenna calibration"

A method according to an aspect of the present invention includes determining a phase offset by simultaneously providing a calibration signal to a first element of an antenna and a second element of the antenna opposite the first element. The method further includes receiving an intermix signal by a third element of the antenna, measuring an amplitude characteristic for the intermix signal, and determining a phase offset based on the amplitude characteristic. The phase offset can be used to adjust a signal provided to the first element so that signals transmitted from the first element and second element are in phase with each other. This method can account for phase errors due to the construction or design of the antenna, and allows antenna elements to be calibrated without the need for phase detector devices. [A1455]

"Method and device for contactless level and interface detection"

Method and apparatus for determining the thickness of material layers of a container-held substance comprising a first material disposed in an upper layer and a second material disposed in a lower layer, by transmitting a radio signal through the substance towards a container portion, receiving reflected signals from a surface of the upper layer, a surface of the second layer, and the container portion, varying the frequency of the transmitted signal to determine phase displacement between transmitted and reflected signals, determining optical distances to the surfaces and the container portion, dependent on the phase displacements, determining the thickness of one of said layers dependent on phase displacement through and index of refraction of that layer, and determining the thickness of the other layer dependent on the thickness of said one of said layers. [A1456]

"Method and apparatus for predicting/alarming the moving of hidden objects"

The invention relates to a method and apparatus for predicting/alarming the moving of hidden objects. The apparatus comprises: a distance sensing unit, for obtaining a distance data detected within a specific sensing range and thus outputting the distance data, a speed sensing unit, for measuring the movement of a carrier to obtain a real-time speed data of the carrier and thus output the speed data, a control unit, for receiving and analyzing the distance data and the speed data to obtain information relating to the position of the carrier, the environment surrounding the carrier and positions of objects moving in the blind spots of the carrier, and thus to perform an evaluation based upon the aforesaid information to determine a danger level for issuing a control signal accordingly, and an alarm unit, for issuing an alarm signal according to the control signal. [A1457]

"Apparatus for determining and/or monitoring the level of a medium"

An apparatus for ascertaining and/or monitoring fill level of a medium in a container. The apparatus includes an antenna, which transmits and receives high frequency signals in a predetermined oscillatory mode in a bounded space in a predetermined radiation direction, wherein, in front of the antenna in the radiation direction, an antenna protection element of a material transmissive for the high frequency signals is provided, and wherein a control/evaluation unit is provided, which evaluates the received high frequency signals and ascertains the fill level. [A1458]

"Leading and lagging aperture for linear ground penetrating radar array"

A radar array linearly traverses an area of ground. Additional radar elements fore and aft of the array detect changes in elevation and orientation of the array. These elements act as a preview for the height changes due to ground variation. Any variation in height that is not detected by these fore and aft-mounted elements is thus due to variation in radar elevation and/or orientation and can be subtracted from the resulting data without introducing distortion. Correction factors are applied to the range data returned from each element in the array, which normalizes the data and makes it appear as if the array did not change orientation or elevation. [A1459]

"Evaluation method, particularly for a driver assistance system of a motor vehicle, for object detection using a radar sensor"

An evaluation method, e.g., for a driver assistance system of a motor vehicle, is provided for object detection using a radar sensor, which synchronously emits at least two separate radar beam lobes, that cover an angular range to be scanned, and which receives respective target responses as measured values. At least two target responses of the at least two separate radar beam lobes of the radar sensor are arithmetically superposed in such a way that a synthetic radar beam lobe is created having at least one predetermined zero value in the scanned angular range. [A1460]

"Method for detecting at least one moving object"

A method for the detection of at least one moving object in a pre-determined detection zone by way of a speed sensor. The method includes the following steps: determining a detection zone within an illumination region of the speed sensor, detecting a speed signal, particularly a Doppler signal, at least with the entry of a moving object into the illumination region, estimating an entry of the moving object into the detection zone on the basis of a speed of the object, and of a distance between a boundary of the illumination region and the detection zone. [A1461]

"Object detection device for vehicle and object detection method for vehicle"

An object detection device for a vehicle includes a transmitting-receiving unit, a reflection point computation unit, an object width computation unit, a representative point setting unit, a lateral relative velocity computation unit, a memory unit, and a lateral relative velocity correction unit. The transmitting-receiving unit transmits an electromagnetic wave. The object width computation unit computes a width of the object. The lateral relative velocity computation unit computes a lateral relative velocity. The memory unit records the object as a width-widening static object when the object is a static object and an amount of increase in the width of the object is greater than a predetermined value, based on a detection history of the object detected at each of the predetermined cycle. The lateral relative velocity correction unit corrects the lateral relative velocity, when the object recorded as the width-widening static object is detected at a left end part or a right end part of a detection region. [A1462]

"Object ranging"

A method for determining at least one of the distance to and the speed of an object is discussed. The method comprises determining an indication of whether the object is approaching or moving away and generating an interrogation signal comprising a sequence consisting of segments at constant frequency and segments of varying frequency, wherein if the determining step indicates the object is approaching then the varying frequency segments have decreasing frequency and if the determining step indicates that the object is moving away then the varying frequency segments have increasing frequency. The interrogation signal is transmitted and a version of the interrogation signal reflected from the object is detected. At least one of the distance to and speed of the object is then determined using a combination of the interrogation signal and the reflected version of the interrogation signal. [A1463]

"Method for surveillance to detect a land target"

A land-based smart sensor system and several system architectures for detection, tracking, and classification of people and vehicles automatically and in real time for border, property, and facility security surveillance is described. The preferred embodiment of the proposed smart sensor system is comprised of (1) a low-cost, non-coherent radar, whose function is to detect and track people, singly or in groups, and various means of transportation, which may include vehicles, animals, or aircraft, singly or in groups, and cue (2) an optical sensor such as a long-wave infrared (LWIR) sensor, whose function is to classify the identified targets and produce movie clips for operator validation and use, and (3) a supercomputer to process the collected data in real-time. The smart sensor system can be implemented in a tower-based or a mobile-based, or combination system architecture. The radar can also be operated as a stand-alone system. [A1464]

"Processing of pulse-echo measurement signals"

Pulse echo signals containing false echoes are processed by forming tracks of multiple received echoes and monitoring these tracks by a recursive filter such as a Kalman filter. A track velocity is estimated for each track, and the position of each the next echo on the track is predicted. [A1465]

"Enchanced interference cancellation and telemetry reception in multipath environments with a single paraboic dish antenna using a focal plane array"

An Advanced Focal Plane Array ("AFPA") for parabolic dish antennas that exploits spatial diversity to achieve better channel equalization performance in the presence of multipath (better than temporal equalization alone) , and which is capable of receiving from two or more sources within a field-of-view in the presence of multipath. The AFPA uses a focal plane array of receiving elements plus a spatio-temporal filter that keeps information on the adaptive FIR filter weights, relative amplitudes and phases of the incoming signals, and which employs an Interference Cancelling Constant Modulus Algorithm (IC-CMA) that resolves multiple telemetry streams simultaneously from the respective aero-nautical platforms. This data is sent to an angle estimator to calculate the target's angular position, and then on to Kalman filters for smoothing and time series prediction. The resulting velocity and acceleration estimates from the time series data are sent to an antenna control unit (ACU) to be used for pointing control. [A1466]

"Systems and methods for using nexrad information to verify weather radar information"

Systems and methods distinguish weather radar returns from terrain radar returns. An exemplary embodiment receives a radar return from a weather radar system on board an installation vehicle, receives ground-based weather radar information, compares a location of the radar return received from the onboard weather radar system with a corresponding location in the received ground-based, and determines that the radar return received from the onboard weather radar system is a weather radar return when a location in the received ground-based weather radar information indicates a presence of weather at the location of the radar return. [A1467]

"Radar system using a projected artificial magnetic mirror"

A projected artificial magnetic mirror (PAMM) radar device includes a transceiver module, a shaping module, and an antenna structure. The antenna structure includes a plurality of metal patches, a metal backing, a dielectric material, and one or more antennas. The metal patches are electrically coupled to the metal backing to form an inductive-capacitive network that, for the one or more antennas and within a given frequency band, substantially reduces surface waves to obtain a detectable angle of incidence of approximately ninety degrees. [A1468]

"Passive proximity sensor method and apparatus"

A passive proximity detection system and method are provided. A transmitted signal, such as a communication signal, is sampled and placed in memory. A version of the transmitted signal, reflected by a target in the vicinity of the transmitting antenna, is sampled and compared to the stored reference sample. Correlation between the reference and reflected samples indicates the presence of a target in the vicinity of the transmitting antenna. Processing of the signals can include frequency shifts to account for Doppler shifts in the reflected energy as a result of a non-zero relative radial velocity of the target. Multiple antennas for receiving reflected energy can be provided to enhance the coverage area of the system, and/or to provide information regarding the relative location of a target. In addition, signals from multiple transmitting antennas can be used as sources of energy for probing the vicinity of those antennas for targets. [A1469]

"Method and apparatus for radar surveillance and detection of sea targets"

In a radar system using a radar clutter map comprising a plurality of range-azimuth cells containing parameter data values indicative of time averaged echo returns for affecting alarm threshold levels at range-azimuth locations scanned by the radar system antenna, a method for detecting comprising the steps of obtaining from the radar clutter map a first parameter data value associated with a given cell under test (CUT) , determining a second parameter data value using parameter data values of other cells from the plurality of range-azimuth cells from the radar clutter map, comparing the first parameter data value associated with the CUT with the second parameter data value, and generating a signal indicative of a target detection when the first parameter data value exceeds the second parameter data value by a given threshold corresponding to a target false alarm rate. [A1470]

"Radar sensing system for vehicle"

A radar sensing system for a vehicle includes a radar sensor device, a cover panel and a control. The radar sensor device is disposed at a pocket established at an upper edge of the vehicle windshield and having a forward transmitting and receiving direction that is not through the windshield. The cover panel is disposed at the radar sensor device and is substantially sealed at the vehicle windshield at or near the pocket at the upper edge of the vehicle windshield. The cover panel has a material that is substantially transmissive to radar frequency electromagnetic radiation waves. The radar sensor device emits radar frequency electromagnetic radiation waves that transmit through the cover panel. The control is responsive to an output of the radar sensor device. [A1471]

"Microwave sensor capable of preventing false alarms due to a bush or tree or the like swaying in the wind"

A movement distance measuring device that measures, as a movement distance, an amount of change per unit of time in a distance to a detected detection target object, an alarm signal output control device that performs control such that an alarm signal is outputted when the measured movement distance is a predetermined determination threshold value or more, and a determination threshold value varying device that varies the determination threshold value to a larger value when a state in which the movement distance is not less than the determination threshold value continues for not less than a first predetermined period and when a state in which the movement distance is less than the determination threshold value and a difference between the determination threshold value and the movement distance is not greater than a predetermined value continues for not less than a second predetermined period. [A1472]

"Mobile radar and planar antenna"

In a conventional automotive radar, a return occurs in a phase difference characteristic necessary for a super-resolution method, resulting in an increase of a detection error, or an extremely narrowed azimuth detection range. A transmitting array antenna, and receiving array antennas are composed of antenna elements respectively, and aligned in a horizontal direction. The weighting of receiving sensitivities of the antenna elements of the receiving array antenna 1 is A1, A2, A3, and A4, which are monotonically decreased from an inner side toward an outer side as represented by A1.gtoreq.A2.gtoreq.A3.gtoreq.A4. On the other hand, the receiving array antenna 3 is symmetrical with the receiving array antenna with respect to the receiving array antenna 1. [A1473]

"3D video-Doppler-radar (VIDAR) imaging system"

A moving sensor suite for imaging a scene has three Doppler radars, two moving and one fixed, a fixed video camera and a fixed GPS receiver. The Doppler radars measure the relative velocities between the radars and the scene, as well as the scene's electromagnetic reflectivity, while the video camera records the motion of the camera and the optical property of the scene. The correct registration of the Doppler radars and the camera is established by finding the intersections of the moving Doppler radar motion vectors with the image plane of the video camera. The scene features in the first frame are determined by Doppler circle intersections. The correspondences of the features in the next two frames are established by a feature matching operation. [A1474]

"Weather radar and weather observation method"

A weather radar includes an antenna unit of an active phased array system in which a plurality of antenna elements configured to transmit a radar pulse and receive a reflected pulse are arranged in a vertical direction, a transmission beam formation unit configured to divide an observation range in the elevation angle direction into a plurality of observation elevation angles, subdivide each observation elevation angle into a plurality of regions, assign a set of a plurality of regions not adjacent to each other to a pulse repetition interval (PRI) , and form a fan-shaped transmission beam in the elevation angle direction for each of the regions in the set, and a reception beam formation unit configured to form a plurality pencil-shaped reception beams for each of the plurality of regions. [A1475]

"Means for dual polarization radar with automatic built-in test equipment and calibration"

A calibration system for the receiver of a dual polarization radar system has been developed. The system includes a radar transmitter that transmits signals in horizontal and vertical polarizations and a radar receiver that receives the horizontal and vertical polarization signals. The system also includes a test signal generator that generates a continuous wave test signal. A calibration circuit for the radar receiver modifies the test signal to simulate weather conditions by adjusting the attenuation and Doppler phase shift of a continuous wave test signal. [A1476]

"Mobile electronic device equipped with radar"

The present invention is directed towards method, apparatus, and computer product for obtaining additional information in relation to a target in the vicinity of a mobile electronic device as well as such a mobile electronic device. The device includes a radar unit for operation in a certain frequency range including a pulse generating unit, a transmitting and receiving antenna, an echo detecting unit, a timing unit for timing the generation and transmission of pulses and providing an echo detection window for the echo detecting unit to detect echoes of said pulses when being reflected by a target, and a signal processing unit configured to process received echo pulses. [A1477]

"Methods and apparatus for coordinating ADS-B with mode S SSR and/or having single link communication"

Methods and apparatus for an ADS-B system having a single link for communication and/or ADS-B/Mode-S coordination. With this arrangement, the system communication is efficiently used. [A1478]

"Radar detector with navigational function"

A GPS enabled radar detector dynamically handles radar sources based upon previously-stored geographically-referenced information on such sources and data from the GPS receiver. The detector includes technology for determining the location of the detector, and comparing this location to the locations of known stationary sources, to improve the handling of such detections. The detector may ignore detections received in an area known to contain a stationary source, or may only ignore specific frequencies or may handle frequencies differently based upon historic trends of spurious police radar signals at each frequency. Notification of the driver will take on a variety of forms depending on the stored information, current operating modes, and vehicle speed. The detector may be also incorporated within a general purpose navigation device. [A1479]

"Camouflage positional elements"

One aspect relates to camouflaging an object by affecting a presentation at least partially using at least one positional element based at least in part on a position of the at least one positional element. Another aspect relates to configuring at least a first camouflage positional element and at least a second camouflage positional element to act as a decoy presentation, an active chaff, and/or a smart chaff. Another aspect relates to providing at least one positional element that can deceive, confuse, defeat, or lead one or more sensors towards or away from a target, such as to act as chaff, one or more flares, fog, one or more decoys, or a combination thereof. Another aspect relates to determining a suitable camouflage for at least one camouflage positional element at least partially considering a background for the at least one camouflage positional element, and affecting a presentation using the at least one camouflage positional element at least partially based on the suitable camouflage. [A1480]

"High-sensitivity subsurface sensing system"

A target is sensed by an antenna array having a transmitter antenna and a receiver antenna, both of which are caused to be electromagnetically coupled to the target. The antenna array is rotated, and as the array rotates, a change in at least one of the coupling between the transmitter antenna and the target and the coupling between the receiver antenna and the target is detected at multiple rotational orientations of the antenna array. [A1481]

"Ultra-wideband ranging method and system using narrowband interference supression waveform"

Disclosed herein is an Ultra-WideBand (UWB) ranging method using a narrowband interference suppression waveform. A transmission signal is transmitted to a target object. The transmission signal, reflected from the target object, is received. A template signal is generated by combining the narrowband interference suppression waveform and a channel estimation signal together. A correlation output signal is generated by convoluting the template signal and the received signal. A distance is calculated using a time delay when the correlation output signal has the maximum value thereof. The narrowband interference suppression waveform is any one of two waveforms that are expressed by the following Equation: w.sub.r1 (t) =g (t-.delta..sub.1/2) +g (t+.delta..sub.1/2) w.sub.r2 (t) =g (t-.delta..sub.2/2) -g (t+.delta..sub.2/2) where g (t) is a basic UWB pulse waveform, .delta..sub.1= (N+1/2) f.sub.1, .delta..sub.2= (N) /f.sub.1, N is an integer, and f.sub.i is the center frequency of a narrowband interference signal. [A1482]

"Collision prediction system and collision predicting method"

A collision prediction system includes a collision face determining unit that determines a collision face of the own vehicle which is presumed to collide with another vehicle, based on a travelling direction of the other vehicle relative to the own vehicle at an estimated collision time at which a collision is presumed to occur, a collision position estimating unit that estimates a collision position as a position of a potential collision between the own vehicle and the other vehicle, based on the collision face determined by the collision face determining unit, and a collision position correcting unit that corrects the collision position estimated by the collision position estimating unit, based on a preset size of the other vehicle. [A1483]

"Circularly polarized antennas for active holographic imaging through barriers"

Circularly-polarized antennas and their methods of use for active holographic imaging through barriers. The antennas are dielectrically loaded to optimally match the dielectric constant of the barrier through which images are to be produced. The dielectric loading helps to remove barrier-front surface reflections and to couple electromagnetic energy into the barrier. [A1484]

"Measuring device for a motor vehicle"

A measuring device, e.g., a measuring device for a motor vehicle, is for measuring a distance between the measuring device and at least one object and/or measuring a difference in speed between the measuring device and the at least one object. The measuring device includes an emitting apparatus for transmitting a transmission signal encompassing at least two sequences of signal portions, a first sequence of signal portions and a second sequence of signal portions with two respective temporally alternating signal portions. The frequency of at least two signal portions of a sequence of signal portions differs by one respective difference frequency, the difference frequency of the first sequence of signal portions being different from the difference frequency of the second sequence of signal portions. [A1485]

"Method and system for reducing light pollution"

A system for preventing light pollution includes one or more radar units that monitor for vehicles in a volume surrounding or containing one or more obstructions having one or more obstruction lights. A master radar detection processing unit receives sensed radar detection information from the one or more radar units with associated radar signal processing units and determines whether a vehicle is present within the monitored volume. A plurality of obstruction light controller units are interconnected in a network, such as a wireless network. Each obstruction light controller unit turns on an obstruction light when a vehicle enters the monitored volume or a failure condition exists, and turns off the obstruction light when the vehicle has vacated the monitored volume and no failure condition exists. The one or more radar units can transmit sensed radar detection information to a master radar detection processing unit via the network. [A1486]

"Ultra-wideband radar waveform calibration for measurements of a heterogeneous material"

Embodiments of the disclosed technology comprise a ground penetrating radio device and methods of use for obtaining greater resolution. This is achieved by measuring the composition/reflection off a homogeneous material (e.g., metal plate) , determining coefficients to correct the measured/reflection in order to make the measurements look like an idealized reference signal, and then using these coefficients in a digital filter to correct measurements/a reflection off a heterogeneous material, such as a road surface. In this manner, the composition of the heterogeneous material is determined with greater accuracy. [A1487]

"Imaging apparatus and method"

A millimeter wave imaging apparatus and method capable of identifying the presence of relatively thin dielectric materials is disclosed. The method involves taking a plurality of millimeter wave images of a scene at different frequencies and analyzing the images at different frequencies to look for frequency dependent effects in the scene. Relatively thin dielectric materials can lead to interference effects which can be detected. In one embodiment the imaging apparatus comprises a millimeter wave imager (2) connected to a processor (16) and at least one variable frequency illumination source (22a . . . d, 24a . . . d) . The or each illumination source sweeps the illumination frequency across a reasonably wide bandwidth and the imager captures radiation returned from the scene at a number of different illuminating frequencies. [A1488]

"Method and system for motion compensation for hand held MTI radar sensor"

Methods to quantify the amount of radial platform motion of a portable sensor are described. In an exemplary embodiment, the method uses the frequency domain phase data in the range bin corresponding to a large stationary object. A correction factor is computed and applied back into the time domain samples prior to processing by Doppler filters used to measure motion in the scene. [A1489]

"Identifying vegetation attributes from LiDAR data"

Aspects of the present invention are directed at using LiDAR data to identify attributes of vegetation. In this regard, a method is provided that identifies the location of individual items of vegetation from raw LiDAR data. In one embodiment, the method includes selecting a coordinate position represented in the LiDAR data that generated a return signal. Then, a determination is made regarding whether the selected coordinate position is inside a geographic area allocated to a previously identified item of vegetation. If the selected coordinate position is not within a geographic area allocated to a previously identified item of vegetation, the method determines that the selected coordinate position is associated with a new item of vegetation. In this instance, a digital representation of the new item of vegetation is generated. [A1490]

"Marine bump map display"

A plotting system and method for plotting radar and/or sonar signals on a bump map, with a simulated height of each data point representing a corresponding signal strength. The plotting system may comprise a processing device for associating particular signal strengths with normal vectors. The normal vectors may be used to determine the simulated heights to be illustrated on the bump map. The plotting system may also comprise a display for graphically displaying the bump map. Furthermore, the processing device may also associate particular signal strengths with particular colors, such that both color and simulated height may illustrate the strength of the plotted signals. [A1491]

"Automotive radar sensor blockage detection system and related techniques"

A blockage detection system and method for use in a sensor such as a side object detection (SOD) sensor in an automotive radar system is described. The sensor emits signals and receives return signals (i.e. reflected signals) from a passing object. If the passing object is within a virtual detection zone, the sensor uses the information from the passing object to determine if a blockage condition exists in the sensor. The technique utilizes statistics related to the passing object to determine whether a blockage condition exists within the sensor. In one embodiment, a SOD sensor mounted in a first vehicle uses information from a second passing vehicle (e.g. radar return information) to determine whether a blockage condition exists within the SOD sensor itself. [A1492]

"Surveillance systems and methods with subject-related screening"

A surveillance system is disclosed. In some embodiments, the surveillance system may include at least one controller configured to receive information data from at least one upstream information source and to control operation of at least one controllable downstream information source based, at least in part, on the information data. A surveillance method also is disclosed. In some embodiments, the method may include analyzing screening data, obtaining information data, and reanalyzing the screening data based, at least in part, on the obtained information data. [A1493]

"Thin film emitter-absorber apparatus and methods"

Methods and apparatus for providing a tunable absorption-emission band in a wavelength selective device are disclosed. A device for selectively absorbing incident electromagnetic radiation includes an electrically conductive surface layer including an arrangement of multiple surface elements. The surface layer is disposed at a nonzero height above a continuous electrically conductive layer. An electrically isolating intermediate layer defines a first surface that is in communication with the electrically conductive surface layer. The continuous electrically conductive backing layer is provided in communication with a second surface of the electrically isolating intermediate layer. When combined with an infrared source, the wavelength selective device emits infrared radiation in at least one narrow band determined by a resonance of the device. In some embodiments, the device includes a control feature that allows the resonance to be selectively modified. The device has broad applications including gas detection devices and infrared imaging. [A1494]

"System for maintaining communication between teams of vehicles"

A system maintains communication between a plurality of unmanned vehicles within an environment. The system includes a sensor component and an evaluator. The sensor component senses objects within the environment. The sensor component is located on a first unmanned vehicle. The evaluator evaluates data from the sensor component. The evaluator is located on the first unmanned vehicle. The evaluator compares data for the first unmanned vehicle and a second unmanned vehicle and determines whether a trajectory of one of the first and second unmanned vehicles may be modified to maintain communication between the first unmanned vehicle and the second unmanned vehicle. [A1495]

"Methods and systems for improved extraction of a signal from a noisy environment"

Methods and systems consistent with the present invention allow identification of a true signal contained in a signal containing the true signal and noise. In general, digital signal information representing a signal of interest plus noise is utilized by the present invention. The first N samples of digital signal information are stored with the Nth sample being stored in manner which renders it accessible for additional operations. A specially selected set of weights are applied to the Nth sample. The phase rotated Nth sample and weighted samples are combined using a first equation, described in more detail below. The resulting signal, which exhibits an increased Signal-to-Noise ratio (SNR) and may be more effectively utilized in subsequent MTI processing by virtue of the operations performed on the previous N samples as described herein, is then available for further processing using conventional techniques. [A1496]

"Running control system for vehicle"

A running control system having a radar device that detects a distance between a subject vehicle and a preceding vehicle. When a vehicle speed sensor detects the subject vehicle has stopped, a transmission output controller sets a transmission output of the radar device to a stopping time transmission output lower than a running time transmission output. When the radar device detects an increase in the distance between the subject vehicle and the preceding vehicle while the subject vehicle is stopped, or when the distance between the subject vehicle and the preceding vehicle detected by the radar device while the subject vehicle has stopped is longer than a predetermined value, a notifying device notifies an occupant of the subject vehicle that following running control is possible. [A1497]

"Detecting operational radar angles based on wavelength specific electromagnetic propagation and surface interaction"

A detector apparatus, detection system, and method are provided for determining optimum operational angles based on the statistical correlation of wavelength-specific electromagnetic propagation and surface interaction. These techniques can be used within the radar community in both military and commercial radar applications for airborne radar system users to determine optimum operational depression angles based on the purpose of the effort, the operational frequency, and the terrain-type to be encountered. The method requires the user to interface with a standard computer equipped with the commercially available MATLAB.RTM. software package where the operation is presented as a graphic user interface (GUI) that once invoked allows the user to set specific parameters corresponding to the desired terrain type. Upon doing so, the algorithms are exercised and the results are displayed in a series of figures identifying the optimum operational angles. [A1498]

"System and method for detecting performance of a sensor field at all points within a geographic area of regard"

A method for determining a path of travel of an intruder traversing an area of regard (AOR) to a predefined point, where the path of travel has a minimum probability of detection relative to other potential paths of travel of the intruder. The method may comprise: providing three dimensional terrain data concerning the AOR, providing the locations of a plurality of detection sensors implemented in the AOR, with each detection sensor having a known field of view, providing a predetermined single scan detection probability for each of the detection sensors, generating a grid of points that is laid over the AOR, and using the foregoing information to determine a particular path of travel, defined by selected arcs connecting specific ones of the grid of points, of the intruder to the predefined point that represents a minimum probability of detection of the intruder. [A1499]

"Method and device for determining the speed of a moving entity"

A method and a corresponding device determines the speed of a moving entity carrying at least two antennas for receiving a transmission signal the antennas being displaced at a predetermined distance. In order to provide a more simple and accurate method which can be used with different transmission signals the method includes the steps of: receiving a transmission signal by the antennas, determining signal characteristics from the transmission signal as received by the determining a time offset between the reception of the transmission signal at the antennas by comparing the signal characteristics determined for the antennas, and determining the speed of the moving entity from the determined time offset, the distance of the antennas and the direction of movement of the moving entity relative to the arrangement of the antennas. [A1500]

"System and method for measuring a relative distance between vehicle components using ultra-wideband techniques"

A system for measuring relative distance between a first component on a vehicle and a second component on the vehicle is provided. The system includes a wireless ultra-wideband (UWB) transceiver attached to the first component. The wireless UWB transceiver transmits a UWB measurement pulse toward the second component, and receives a reflected UWB pulse from a reflective surface of the second component. The reflected UWB pulse represents a reflected version of the UWB measurement pulse. The system also includes a processor coupled to the wireless UWB transceiver. The processor derives a relative distance between the first component and the second component, based upon characteristics of the UWB measurement pulse and the reflected UWB pulse. The system further includes a power generating system for the wireless UWB transceiver. The power generating system generates operating voltage for the wireless UWB transceiver from kinetic energy associated with motion of the first component relative to the second component. [A1501]

"Detecting device and railroad vehicle"

A system according to the invention detects location information of a vehicle by using a reflection strength change of an electromagnetic wave. The system incorporates a radiowave transmitter which emits a first radiowave, positional markers which generate unique reflection strengths and patterns of temporal changes in the reflection strength from the emitted first radiowave at respective absolute positions, a radiowave receiver which receives a second radiowave reflected by the positional marker and converts the second radiowave into a signal format for extracting location information to output the same, and a marker recognition device which obtains a location of the vehicle from the output of the radiowave receiver. Accordingly, a highly-precise location specification with a resolution smaller than or equal to 1 cm and a highly-reliable location specification which is not affected by slip and slide of the vehicle's wheels can be realized. [A1502]

"Transmission scheduling for ADS-B ground systems"

System and methods for reducing redundant messages broadcast in an Automatic Dependent Surveillance-Broadcast (ADS-B) system. for a given target, a controller determines the relevant customers that should receive information about the target, identifies all of the ground stations that can be satisfactorily heard by the relevant customers, and then identifies a smaller subset of ground stations by selecting only those ground stations that are needed to reach all of the relevant customers. ADS-B messages are then broadcast to the relevant customers using only the smaller subset of ground stations. [A1503]

"Selective reflective and absorptive surfaces and methods for resonantly coupling incident radiation"

Methods and apparatus for providing a tunable absorption band in a wavelength selective surface are disclosed. A device for selectively absorbing incident electromagnetic radiation includes an electrically conductive surface layer including an arrangement of multiple surface elements. The surface layer is disposed at a nonzero height above a continuous electrically conductive layer. An electrically isolating intermediate layer defines a first surface that is in communication with the electrically conductive surface layer. The continuous electrically conductive backing layer is provided in communication with a second surface of the electrically isolating intermediate layer. The arrangement of surface elements couples at least a portion of the incident electromagnetic radiation between itself and the continuous electrically conductive backing layer, such that the resonant device selectively absorbs incident radiation, and reflects a portion of the incident radiation that is not absorbed. [A1504]

"GPS navigation code system"

A GPS navigation code device has GPS features and easy address retrieval means built in, enabling a driver to retrieve and request directions to an address without taking his eyes off the road. The user pre-programs the GPS navigation code device with a plurality of addressees or points of interest and assigns unique navigation codes for each. The navigation code is entered using keyboard or recorded speech pattern. The processor in the GPS navigation code device records address, navigation code and speech pattern in three linked databases. While driving, the user presses a special address search mode key and inputs the unique navigation code by keyboard or speech pattern. The GPS navigation code device displays the address and the user accepts the displayed address by pressing special key. The GPS navigation code device then calculates and displays directions to the address, and provides additional guidance by speech on a turn-by-turn basis. [A1505]

"Range gated holographic radar"

Narrow virtual transmit pulses are synthesized by differencing long-duration, staggered pulse repetition interval (PRI) transmit pulses. PRI is staggered at an intermediate frequency IF. Echoes from virtual pulses form IF-modulated interference patterns with a reference wave. Samples of interference patterns are IF-filtered to produce high spatial resolution holographic data. PRI stagger can be very small, e.g., 1-ns, to produce a 1-ns virtual pulse from very long, staggered transmit pulses. Occupied Bandwidth (OBW) can be less than 10 MHz due to long RF pulses needed for holography, while spatial resolution can be very high, corresponding to ultra-wideband (UWB) operation, due to short virtual pulses. X-Y antenna scanning can produce range-gated surface holograms from quadrature data. Multiple range gates can produce stacked-in-range holograms. Motion and vibration can be detected by changes in interference patterns within a range-gated zone. [A1506]

"Mobile device enabled radar tags"

A method is provided for mobile device enabled radar tags. A signal is transmitted to a radar tag. The radar tag detects the signal. The radar tag provides information. The information is received from the radar tag. A location of the radar tag is determined based on the information. The radar tag is identified based on the information. The identification of the radar tag, the location of the radar tag, and a time associated with determining the location of the radar tag are recorded as data in a database. The radar tag is evaluated based on accessing a plurality of recordings of the data in the database. [A1507]

"Radiobased locating system provided with a synthetic aperture"

The invention relates to a method for increasing the accuracy of a measurement of a radio-based locating system comprising a mobile station and at least one fixed station, wherein the movement of a mobile station from an initial position is detected by way of measuring data of an absolute sensor system and a relative sensor system, a virtual antenna is embodied in the form of synthetic aperture by way of measuring data and the mobile station is focused on the fixed station and/or vice versa by using the synthetic aperture. [A1508]

"Millimeter wave imaging system with frequency scanning antenna"

A millimeter wave imaging system. The system includes one or more millimeter wave frequency scanning antenna for collecting frequency dependent beams of millimeter wave radiation from a narrow one-dimensional field of view and millimeter wave amplifier components for amplifying the millimeter wave radiation collected by each antenna. The system includes a beam-former that separates the amplified radiation to produce frequency dependent signals corresponding to the frequency dependent beams. The beam-former includes delay lines, a millimeter wave lens, and an array of millimeter wave power detectors for detecting the power in each frequency dependent beam. A sampling circuit reads out the frequency dependent signals to produce a one-dimensional image of the antenna field of view. A two dimensional image of a target may be obtained by moving the target (or having the target move) across the field of view of the scanning antenna or by moving the antenna in order to scan its line of focus over the target. In preferred embodiments a 2.times.2 Dicke switch is provided to permit sampling a reference thermal source for gain control while continuing to collect image information. This 2.times.2 Dicke switch provides a square root of 2 improvement in temperature sensitivity over a single receiver version. Preferred embodiments also include features for focusing the antenna within a range of about 5 feet to infinity. [A1509]

"Automatically generating precipitation proximity notifications"

A method and system for automatically generating a notification of a status of precipitation being received by a user-defined detection zone within a geographic area. An image of the geographic area is received. The image includes pixels associated with the detection zone. Each pixel is associated with a sub-area of the detection zone. Characteristics (e.g., colors) of the pixels are obtained. The characteristics indicate intensities of precipitation being received by sub-areas of the detection zone. The intensities of precipitation that are greater than a first user-defined threshold are counted to produce a count. Based on the count's comparison to a second user-defined threshold, a status of precipitation being received or not being received by the detection zone is determined. A notification of the status is generated and sent. [A1510]

"Low-cost, high-performance radar networks"

A real-time radar surveillance system comprises at least one land-based non-coherent radar sensor apparatus adapted for detecting maneuvering targets and targets of small or low radar cross-section. The radar sensor apparatus includes a marine radar device, a digitizer connected to the marine radar device for receiving therefrom samples of radar video echo signals, and computer programmed to implement a software-configurable radar processor generating target data including detection data and track data, the computer being connectable to a computer network including a database. The processor is figured to transmit at least a portion of the target data over the network to the database, the database being accessible via the network by at least one user application that receives target data from the database, the user application providing a user interface for at least one user of the system. [A1511]

"Electromagnetic wave absorption board to be used in wireless LAN"

In a double glazing where a pair of transparent glass sheets are arranged at an interval by having a spacer at the circumferential end portion and where a hollow layer sealed between the pair of glass sheets is formed, there is provided an electromagnetic absorption board used for wireless LAN, which is characterized in that the thickness of the glass sheet is in a range of 2.5-20 mm, that the thickness of the hollow layer is in a range of 2.5-15 mm, that at least one glass sheet of the pair of glass sheets is formed with a resistive film having a surface resistance (surface resistivity) in a range of 20.OMEGA./.quadrature. to 2 k.OMEGA./.quadrature., and that the resistive film is formed on a glass sheet side on the hollow layer side. [A1512]

"Distance measuring device and distance measuring method"

There are provided a distance measuring device and a distance measuring method characterized by "simple configuration", "capability of measuring a near distance", and "a small measurement error" like a distance measuring device using a standing wave. The distance measuring device includes a signal source (1) for outputting a signal having a plurality of different frequency components within a particular bandwidth, a transmission unit (2) for transmitting a signal as an undulation, s mixed wave detection unit (3) for detecting a mixed wave VC obtained by mixing a progressive wave VT transmitted and a reflected wave VRk of the progressive wave VT reflected by a measurement object (6) , a frequency component analysis unit (4) for analyzing the frequency component of the mixed wave VC detected, and a distance calculation unit (5) for obtaining a distance spectrum by subjecting the analyzed data further to spectrum analysis, thereby calculating the distance to the measurement object (6) . [A1513]

"Utility mapping and data distribution system and method"

A system and method of mapping underground utilities and other subsurface objects involves one or more of acquiring utility location data using a number of different detectors and sensors, processing the multiple detector/sensor output data to produce mapping data, storing the mapping data in a database, and providing access to and use of the stored mapping data by subscribing users on a usage fee basis. [A1514]

"Resolution antenna array using metamaterials"

An antenna array includes at least one transmit array comprising a plurality of metamaterial elements. The antenna array further includes at least one near-field stimulator for inputting electromagnetic signal to the transmit array so that a sub-wavelength target is illuminated with an electromagnetic wave. [A1515]

"Detection and compensation of target losses when there is a channel change"

The present invention relates to a method of detecting and correcting the loss of a target lost by the distance sensor installation of a motor vehicle when a target object (4) moves from one detection channel of the distance sensor installation to an adjacent detection channel, wherein the method consists of determining the mean size of a weak detection band between the intensity peaks of two adjacent detection channels and computing the time a narrow target object (4) , particularly if it is a single-channel target object, remains in this previously determined band. [A1516]

"Target detection method for use in radar and radar device using the target detection method"

A radar device includes a transmission antenna and a reception antenna having a plurality of antenna elements. The radar device switches the antenna elements in synchronization with a modulation cycle, thereby obtaining a reception signal. At this time, the radar device obtains the reception signal by switching the antenna elements using a first measurement phase and a second measurement phase having different switching cycles as one set. The radar device calculates an azimuth sine value sin .theta..sub.1 from the reception signal in the first measurement phase and also calculates an azimuth sinusoidal value sin .theta..sub.2 from the reception signal in the second measurement phase. Then, the radar device calculates a relative velocity V from the azimuth sine value sin .theta..sub.1, the azimuth sine value sin .theta..sub.2, an interval time difference .DELTA.t between switching cycles, and an inter-antenna element spacing d. [A1517]

"Identification and mapping of underground facilities"

A system or method of creating a map of voids in the ground based on a scattered electromagnetic signal includes traversing a receiver/probe in a near field above a target area, generating a signal from a signal transmitter, the signal having a predetermined wavelength .lamda., receiving a scattered signal with the receiver/probe, the scattered signal including indications of subsurface variations via reflection of the generated signal, and detecting evanescent components of the scattered signal to provide a predetermined resolution. The method includes the use of an electrically small antenna for resolution of subwavelength features. The metamaterial-based antenna is on the order of meters and has an efficient transmit/receive capability. The ESA is 1/10 of the length of the equivalent dipole length, and may be scaled down to 1/10,000. Such an antenna may include phase sensitive current injection in the metamaterial resonant structures for loss-compensation. [A1518]

"GPS with radar detector"

A GPS system includes a frame having a window, a GPS navigator supported by the frame, wherein a display of the GPS navigator is facing opposite to the window of the frame, a radar detector received in the frame to align with the window thereof, and an attaching element attaching the GPS system to an interior side surface of a vehicle such that the display of the GPS navigator is rearwardly facing towards the driver while the radar detector is forwardly sending out detecting signal through the window of the frame. The GPS system integrates the two important driving assistant equipments together, occupies minimal mounting space, and utilize only one car power outlet. [A1519]

"System for enhanced detection of a target"

A method for discrimination of a target from clutter, comprising: providing phase-range data associated with a return pulse of a radar device and second phase-range data associated with a subsequent return pulse, comparing the phase-range data and the second phase-range data to obtain a difference, differentiating the differences with respect to range, and discriminating the target from the clutter by identifying coordinates from the differentiated differences satisfying velocity thresholds associated with the clutter. In one embodiment, the subsequent return pulse is drawn after skipping one or more pulses after the return pulse. In another embodiment, the subsequent return pulse is drawn successive to the return pulse. In other aspects, the invention can be a detection system and/or computer-readable medium adapted implement the method. [A1520]

"High sensitivity frequency modulated radar level gauge system"

A radar level gauge system for determining a filling level of a product contained in a tank, comprising: a transceiver for generating, transmitting and receiving frequency-modulated electromagnetic signals, a transmitting propagating device electrically connected to the transceiver and arranged to propagate transmitted electromagnetic signals towards a surface of the product contained in the tank, and a receiving propagating device electrically connected to the transceiver and arranged to return echo signals resulting from reflections at impedance transitions encountered by the transmitted electromagnetic signals, including a surface echo signal resulting from reflection at the surface, back to the transceiver. [A1521]

"Method of determining a disturbance echo profile for a radar level gauge system"

A method of determining a filling level of a product contained in a tank, the method comprising generating and transmitting electromagnetic signals, propagating the transmitted electromagnetic signals towards a surface of the product contained in the tank, receiving echo signals resulting from reflections at impedance transitions encountered by the transmitted electromagnetic signals, including a surface echo signal resulting from reflection at a surface of the product, determining a position of a reference impedance transition using a reference echo signal resulting from reflection of the transmitted electromagnetic signals at the reference impedance transition, determining an update level located above the surface, based on the determined position of the reference impedance transition and a known position of the reference impedance transition, determining a disturbance echo profile using at least one of the echo signals resulting from reflection of the transmitted signals at at least one impedance transition located above the update level, and determining the filling level based on the received echo signals and the disturbance echo profile. [A1522]

"Radar apparatus and mobile object"

A signal processing circuit detects, at a plurality of different timing points, a first and a second distance of an oncoming vehicle approaching a vehicle including the radar apparatus and detects a first and a second component of a relative velocity of the vehicle in the radar-apparatus direction. A distance of closest approach of the oncoming vehicle to the vehicle appears when the vehicle and the oncoming vehicle pass each other side by side. The signal processing circuit computes the distance of closest approach on the basis of a formula indicating that a relative velocity given by the first distance, the distance of closest approach, and the first component of a relative velocity in the radar-apparatus direction is equal to a relative velocity given by the second distance, the distance of closest approach, and the second component of a relative velocity in the radar-apparatus direction. [A1523]

"Method of and device for tracking an object"

A method of tracking an object including the steps of: collecting N measurements of range R.sub.i and Doppler velocity D.sub.i associated with the object from a plurality M of radar sensors S.sub.i each measurement being assigned a time stamp t.sub.i, time aligning each Range R.sub.i measurement to a common time stamp t.sub.N to provide a corresponding time aligned range P.sub.i for each of the N measurements, using each time aligned Range measurement P.sub.i to define a corresponding spherical equation such that N spherical equations are defined, and deriving analytical solutions from three of the N spherical equations to determine the position vector of the object. [A1524]

"Electromagnetic pulse reflector detection method"

Detecting reflectors of an emitted electromagnetic pulse, using a received signal, by time-sampling the received signal and the emitted pulse at a same sampling frequency, each received sample corresponding to a return-trip distance for the emitted pulse between its transmitter and a possible reflector. The sampled received signal is divided by the emitted pulse sampled and temporally translated into an interval of duration equal to the emitted pulse divided into L samples, producing L results of the division. A weighted summing of the L results of the division is calculated, the sets of L weights each having a support on which the weights are not zero, every subinterval of length between L/n and L being the support for at least one set of weights and no support having a length of less than L/n, wherein the sums of the weights of a set all being equal, and n is a nonzero integer such that L/n is greater than or equal to 2. Finally, determining the minimum of the summations, wherein a nonzero minimum characterizes the amplitude of the pulse reflected by a reflector located at the distance corresponding to the start of a time interval being considered. [A1525]

"Apparatus and method to identify targets through opaque barriers"

The present invention is a method and apparatus that provides detection, characterization, and intuitive dissemination of targets. This disclosure combines improvements to ultra-wideband (UWB) sensing and machine target characterization with a means to convey data in a format that is quickly and readily understood by practitioners of the technology. The invention is well suited for Situational Awareness (SA) support in areas that are occluded by rain, fog, dust, darkness, distance, foliage, building walls, and any material that can be penetrated by ultra-wideband RF signals. Sense Through The Wall (STTW) performance parameters including target range, stand-off distance, and probability of detection are improved herein by combining a dynamically positioned sliding windowing function with orthogonal feature vectors that include but are not limited to time amplitude decay, spectral composition, and propagation time position in the return signal data. This invention is particularly useful for STTW and SA applications including urban combat, law enforcement, fire protection, transportation security, and homeland security. The invention can also be used to detect objects that are concealed by clothing, debris, and other non-metallic materials. [A1526]

"Apparatus for estimating state of vehicle located in frontward field"

An estimation apparatus estimates a state of a vehicle located in a frontward field. Positional coordinates of a plurality of positions on an object are measured by radiating radar waves toward the frontward field and receiving reflected radar waves from an object in the frontward field. A position, direction and size of a graphical pattern are obtained by approximating the graphical pattern into a profile pattern of the object. The graphical pattern is modeled as a profile of a vehicle. A direction and size of the graphical pattern are unknown. The profile pattern is expressed by the positional coordinates. As the state of the vehicle located ahead, a position of the vehicle, a direction of the vehicle, and one of a whole length and a whole width of the vehicle are estimated based on the position, the direction, and the size of the graphical pattern. [A1527]

"Generalized inner product method and apparatus for improved detection and discrimination"

Method and apparatus for improving the detection and discrimination of slow moving or stationary range-Doppler spread objects on or in close proximity to the ground (or sea surface) . Invention detects, discriminates and separates radar returns from interference including ground clutter discretes via a coherent process for separating target returns from the myriad of received signals. Thus the method and apparatus improves the probability of detecting and declaring the presence or absence of an object at the same time that the probability of false declaration decreases. The method and apparatus may be applied to the processing of any over resolved object, including airborne radar. [A1528]

"Active imaging using satellite communication system"

An active imaging system uses communication satellites to identify the location and physical attributes of a target. A transmitter emits a time-synchronized signal directed to a target. The transmitter radiates L-band RF signals. The transmitter can be positioned on an airborne or ground platform. A constellation of communication satellites receives and time stamps the time-synchronized signal reflected from the target to form an active image of the target. The constellation of communication satellites have multiple roles other than active imaging, such as providing voice and data communications. The time-synchronized signal reflected from the target can be received by multiple satellites within the constellation of communication satellites or by multiple antenna disposed on one satellite within the constellation of communication satellites. [A1529]

"Method and system for presence detection"

A method and system for presence detection within a detection volume delimited by an inner radius and an outer radius using microwave radiation. The outer radius of the detection volume is controlled by selecting the length of a first pulse controlling the transmit interval of a microwave transmitter and by selecting the length of a third pulse controlling the receive interval of a microwave receiver. The inner radius of the detection volume is controlled through selecting the length of a second pulse defining a predetermined time period between the first pulse and the third pulse. [A1530]

"Millimeter wave imaging system"

An imaging system operative in a frequency range starting from X band and including the terahertz region has a receiving antenna having a spheroidal reflector. One or more arrays of detectors disposed at the focus adjacent to the reflector of the receiving antenna provides for imaging targets within a range of a few meters around the second focus of the spheroidal reflector. Images of targets such as of concealed objects under clothing are generated and displayed as is known in the art. A method for manufacturing reflectors of receiving antennae given a detection range and a focal range is provided. [A1531]

"Adaptive moving target indicator (MTI) clutter rejection filter for radar systems"

Apparatus for providing moving target indicator (MTI) filtering in the presence of clutter for a radar receiver employing digital pulse compression to provide at an output a compressed digital pulse for application to the input of a MTI digital filter, including a digital adaptive filter of the same weight as the MTI filter and operative to receive the compressed pulse to provide at outputs of the filter a set of weighted filter coefficients, wherein the weighted coefficients are applied to the MTI filter during a predetermined clutter mode. [A1532]

"Obstacle detection system notably for an anticollision system"

The present invention relates to system for detecting obstacles (13, 55, 56, 57) on the ground (15) onboard a carrier (1) . The detection system comprises at least two continuous-wave radars (2, 3, 4) . The radars (2, 3, 4) are linked to a system (15) for utilizing the detection data arising from the radars (2, 3, 4) . The detection system performs localization of an obstacle (13, 55, 56, 57) : along a radial axis (12) between a radar (2, 3, 4) and the obstacle (13, 55, 56, 57) , by calculating the distance between the radar (2, 3, 4) and the obstacle (13, 55, 56, 57) , along a vertical axis (14) with respect to a radar (2, 3, 4) , by calculating the elevation of the obstacle (13, 55, 56, 57) using monopulse deviation-measurement processing. The detection system performs localization of an obstacles along a horizontal axis (18) transverse with respect to a sighting axis (11) of a radar (2, 3, 4) , by calculating the azimuthal position of the obstacle (13, 55, 56, 57) . The invention applies notably in respect of the detection of obstacles on the ground so as to avoid any collision between a taxiing aircraft and these obstacles. [A1533]

"Obstacle detecting method, obstacle detecting apparatus, and standard moving-body model"

An obstacle detecting method for detecting a presence of an obstacle to a moving body using a sensor mounted on the moving body. The obstacle detecting method includes setting a movable area which is a surrounding area of the moving body and in which the moving body can move, arranging plural unconfirmed bodies over an entire area of the movable area as obstacle candidates as an initial state, and deleting the obstacle candidate which is determined not to be actually present as a result of detection by the sensor from the obstacle candidates arranged as the initial state. [A1534]

"Runway identification system via radar receiver"

A runway identification system including a weather radar system. The weather radar system includes a receiver. The receiver is configured to receive a runway characteristic signal from a transponder associated with a runway. The runway identification system determines a runway identification based on the runway characteristic signal. [A1535]

"Disaster countermeasure support method"

A ground surface as an image acquiring object is acquired by a synthetic aperture radar mounted on an artificial satellite at a usual time before occurrence of a disaster and thereby radar image data are obtained. After the occurrence of the disaster, an image of the ground surface as the image acquiring object is acquired within days shorter than the number of orbit returning days and by comparing this radar image data with the radar image data acquired at the usual time so as to try to early grasp a damaged situation. At a recovering and rebuilding time after the occurrence of the disaster, images of the image acquiring object are periodically acquired so as to prepare a recovering and rebuilding plan and prevent secondary disasters. [A1536]

"Apparatus and method for detecting and locating hidden objects"

An apparatus and method for detecting and locating hidden objects employs a symmetrical array of five directional antennas, including a central transmit antenna and a pair of receive antennas at each side of the transmit antenna, respectively. All of the antennas are pointed in the same general direction toward an object field of interest. The transmit antenna radiates a beam of high-frequency electromagnetic energy, and the receive antennas receive high-frequency electromagnetic energy returned by hidden objects. Each pair of receive antennas has an associated phase detector, the output of which represents the phase difference between receive antenna signals corresponding to the received electromagnetic energy. A circuit determines when the outputs of the phase detectors represent predetermined phase differences and operates indicator devices. [A1537]

"Radar device"

A radar device is mounted on a vehicle, for detecting an object, and includes: a transmitting unit for transmitting an electromagnetic wave as a transmitter signal, a receiving unit for receiving a reflected signal that is reflected from the object as a receiver signal, a signal processing unit for measuring a distance and a relative velocity between the vehicle and the object on the basis of a beat signal that is obtained by the transmitter signal and the receiver signal, and an interference detecting unit for detecting the interference signal from another radar device or a communication device on the basis of a signal intensity of the frequency range that is not used for measuring the distance to the object and the relative velocity of the object. [A1538]

"Communications radar system"

A system for a mobile ad-hoc communications network includes a single antenna aperture and a phased array antenna comprising a plurality of radiators communicating electromagnetically via the single antenna aperture. The system may also include a control circuit communicatively connected to the phased array antenna. The control circuit may include a communications module for transmitting and receiving communication data via the phased array antenna through the single antenna aperture and a radar module for transmitting and receiving radar signals via the phased array antenna through the single antenna aperture. [A1539]

"Vehicular lamp"

A vehicular lamp includes a lamp chamber formed by a lamp body opening forward and a transparent front cover attached to a forward opening portion thereof, a lamp unit disposed within the lamp chamber, a millimeter wave radar for sending a millimeter wave to reflect off of an object in order to detect a distance and a relative speed of the object, and a millimeter wave direction-changing mechanism for sending forward the millimeter wave sent by the millimeter wave radar from a back surface side of the lamp unit, without reflecting the millimeter wave on a rearward side of the lamp unit. [A1540]

"Method and apparatus for using collimated and linearly polarized millimeter wave beams at Brewster's angle of incidence in ground penetrating radar to detect objects located in the ground"

A detection system comprises a transmitter unit, a receiver, and a processor. The transmitter unit is capable of transmitting a first collimated beam having a first frequency and a second collimated beam having a second frequency into a ground, wherein the first collimated beam and the second collimated beam overlap in the ground. The receiver is capable of monitoring for a response radio frequency signal having a frequency equal to a difference between the first frequency and the second frequency. The response radio frequency signal is generated by an object having non-linear conductive characteristics in response to receiving the first collimated beam and the second collimated beam. The processor is capable of controlling an operation of the transmitter unit and the receiver. The processor is connected to the transmitter unit and the receiver. The object is detected when the response radio frequency signal is detected by the receiver. [A1541]

"Less than full aperture high resolution phase process for terrain elevation estimation"

A method of determining an angle with a beam to terrain for a terrain avoidance system includes receiving first data associated with first returns associated with a first portion of an antenna. The method further includes receiving second data associated with second returns associated with a second portion of the antenna, wherein the first portion is different than, intersects, or includes the second portion. The method further includes determining the angle to terrain using the first data and second data. [A1542]

"Water friend or foe system for global vessel identification and tracking"

A Water Friend or Foe System (WFSS) includes a Subscriber Identity Module (SIM) card in a SIM reader on a marine vessel. A transmitter, which is coupled to the SIM reader, transmits information from the SIM card, as well as positioning information, to a WFFS tracking station. [A1543]

"Scanning ultra wideband impulse radar"

In one embodiment, an ultra wide band (UWB) radar includes: a substrate, a plurality of antennas adjacent the substrate, the plurality of antennas being arranged into a plurality of sub-arrays, an RF feed network adjacent the substrate, the RF feed network coupling to a distributed plurality of amplifiers integrated with the substrate, wherein the RF feed network and the distributed plurality of amplifiers are configured to form a resonant network such that if a timing signal is injected into an input port of the RF feed network, the resonant network oscillates to provide a globally-synchronized RF signal across the network, a plurality of pulse-shaping circuits corresponding to the plurality of sub-arrays, each pulse-shaping circuit being configured to receive the globally-synchronized RF signal from the network and process the globally-synchronized RF signal into pulses for transmission through the corresponding sub-array of antennas, and an actuator for mechanically scanning the UWB radar so that the pulses transmitted by the antennas scan across a desired area. [A1544]

"Apparatus and method for ranging of a wireless transceiver with a switching antenna"

A sensor includes a transceiver configured to receive a wireless signal from an interrogator and to reflect the wireless signal back. The sensor also includes an antenna-switching modulator configured to modulate a radar cross-section of the sensor by repeatedly switching an antenna between, for example, a short-circuit position and an operational circuit position. The operational circuit position could be associated with an impedance matched receiver, and the short-circuit position could be associated with ground. Also, the sensor could be further configured to transmit the wireless signal to a second sensor and to receive a reflected wireless signal from the second sensor, and the sensor could further include a phase comparator configured to compute a phase difference between the transmitted wireless signal and the reflected wireless signal. The phase comparator could be further configured to compute a distance between the sensor and the second sensor based on the phase difference. [A1545]

"Tire state monitoring apparatus"

There is provided a tire state monitoring apparatus including transponders mounted on a plurality of tires possessed by a vehicle, and ECUs provided on a vehicle body repeatedly transmit address electric waves for acquiring data showing tire states to the transponders at fixed intervals. The ECUs transmit estimates of the transmission timing of the address electric waves at the predetermined transmission cycle so that the transponders can transmit the address electric waves within a communicable range, maintain the predetermined transmission cycle if the estimated transmission timing satisfies a predetermined condition, and adjust the predetermined transmission cycle if the transmission timing does not satisfy the predetermined condition. [A1546]

"Vehicle radar sensor assembly"

A radar electronics module includes a support structure having a first surface having a plurality of recesses with a transmitter circuit board and a receiver circuit board disposed thereon. The transmitter and receiver circuit boards are disposed over the first surface of the supports structure such that transmitter and receive circuits are disposed in cavities on the support structure. The radar electronics module further includes a digital/power supply circuit printed wiring board (PWB) disposed on a second surface of the support structure and a connector disposed on the support structure. The connector is disposed in such a way that it provides electrical connections for at least one of power signals, analog signals or digital signals between at least two of the digital/power supply PWB, the transmitter circuit board and the receiver circuit board. [A1547]

"Automated radar elevation angle configuration"

According to an embodiment of the disclosure, a computer implemented method of configuring a land-based radar system for scanning a scan region is disclosed. The method comprises dividing the scan region into a grid of blocks and obtaining a terrain elevation data for the scan region. for an elevation angle for the radar system, determining those blocks in the grid that are visible to the radar system and those blocks that are not visible to the radar based on the terrain elevation data. Then, step of determining the visible blocks is repeated for all elevation angles in a predefined set of elevation angles for the radar system. Next, an optimal scan elevation angle for the radar system is determined as the scan elevation angle which resulted in the maximum number of visible blocks in the scan region and the radar system is set to the optimal scan elevation angle. [A1548]

"Methods and apparatus for using interferometry to prevent spoofing of ADS-B targets"

Methods and apparatus for preventing spoofing of targets, such as aircraft, in an air traffic control system. In one embodiment, first and second antennas at respective ground stations can be used to receive a signal transmitted by an aircraft from which a phase signal can be generated. A position of the aircraft generate can be generated from peaks and troughs in the phase signal due to movement of the aircraft. The determined position can be compared to a position reported by the aircraft to identify spoofing of the target. [A1549]

"System for measuring turbulence remotely"

A system for detecting turbulence along a path that is subject to turbulence. The system may make use of at least one transmitter to transmit electromagnetic (EM) energy along the path and at least one receiver to receive the EM energy. At least one of the transmitter and the receiver moves along the path. The receiver may have an antenna responsive to incident EM energy to produce a received signal, and an input for accepting a velocity signal indicating a velocity that the receiver or the transmitter is moving. The receiver processes the received signal using the velocity signal to remove a shift associated with the received signal because of relative motion between a source of the EM energy and the receiver or transmitter that is moving along the path. Thus, the receiver determines an alteration of the EM energy caused by the turbulence and outputs a signal indicative of the turbulence. [A1550]

"Method for correcting weather data"

The invention relates to a method, an apparatus and a computer program product for correcting the weather data of radial speed, spectral width and/or differential reflectivity which have been acquired from radar echo data recorded by a ground-based, radar-based remote-sensing appliance (1) for measuring atmospheric conditions and including evaluable weather echoes and interfering ground echoes, corrected weather data being obtained by calculating out the interfering ground echoes from the acquired weather data by using a previously stored clutter map with an intensity distribution of radar echo data which include the ground echoes substantially without weather echoes. [A1551]

"Radar system"

Electronically steered radar systems such as frequency scanning radars are particularly suitable for detecting and monitoring slow moving, ground-based targets. So-called crawler radar systems are intended for detection of targets that deliberately attempt to avoid detection by keeping low and by moving slowly. Disclosed is a radar system which includes an electronically steered antenna and a receiver arranged to process signals received from a target located at a distance from the radar system so as to identify a Doppler frequency associated with the target. The antenna stares at, rather than glides past, the target surrounding clutter. This means that the spectral spreading of static ground clutter associated with mechanical radar systems can be eliminated, overcoming one of the shortcomings of mechanical radar systems that would otherwise render a crawler radar system unsuitable for Doppler processing. [A1552]

"Method and system for reducing light pollution"

A system for preventing light pollution includes one or more radar units that monitor for vehicles in a volume surrounding or containing one or more obstructions having one or more obstruction lights. A master radar detection processing unit receives sensed radar detection information from the one or more radar units with associated radar signal processing units and determines whether a vehicle is present within the monitored volume. A plurality of obstruction light controller units are interconnected in a network, such as a wireless network. Each obstruction light controller unit turns on an obstruction light when a vehicle enters the monitored volume or a failure condition exists, and turns off the obstruction light when the vehicle has vacated the monitored volume and no failure condition exists. The one or more radar units can transmit sensed radar detection information to a master radar detection processing unit via the network. [A1553]

"Multi-use bearing and range line"

A method (400) , a system and a computer program product are disclosed for graphically displaying air traffic control information in an air traffic control system. Information about objects in an air traffic control environment is compiled and calculated (410) . Tokens (e.g., text, icons, images, or other symbols) corresponding to the objects in the air traffic control environment are displayed (420) . At least two objects are selectively designated (430) in combination as a source object and a target object connected by a bearing and range line token (210, 220, 230, 240) . Air traffic control information (212, 222, 232, 242) about the combination of objects associated with the bearing and range line token dependent upon the combination of objects designated in the combination is displayed (440) . The displayed air traffic control information is required decision making information to enable an air traffic controller to manage air traffic. Display of the air traffic management information is dynamically updated (450) upon any change of the designated objects. [A1554]

"Weather radar system and method using data from a lightning sensor"

A weather radar system includes an input for receiving lightning detection data and processing electronics for determining a presence of a convective cell or associated hazard. The processing electronics receive weather radar data and the lightning detection data. The weather radar data is related to radar returns. The processing electronics provide temporal or spatial filtering of the lightning detection data to provide filtered data and determine a position of the convective cell or associated hazard in response to the weather radar data and the filtered data. [A1555]

"Modular flashlight apparatus for firearm"

The present disclosure relates to a flashlight apparatus including a base module having a mount adaptor mountable on a firearm, a reflector module removably attachable to the base module, a power source module removably attached to the base module, and a light source module removably attachable to the base module, the light source module including an illumination light source and a laser light source. In a further aspect, an identification friend or foe system is provided. [A1556]

"Device for determining and monitoring the level of a medium in a container"

The invention relates to an apparatus (1) for ascertaining and monitoring fill level (2) of a medium (3) in a container (4) by means of a travel-time measuring method of high-frequency measurement signals (6) with a horn antenna (7) having a waveguide section (8) , a flared, horn section (9) and a cavity (11) filled, at least partially, with a dielectric filling body (12) . Object of the invention is to provide a simple, temperature-stable, horn antenna filled with a dielectric material. [A1557]

"Vehicular traffic surveillance doppler radar system"

A vehicular traffic surveillance Doppler radar system and method for use of the same are disclosed. In one embodiment, the system comprises a modulation circuit portion for generating modulated FM signals. An antenna circuit portion transmits the modulated FM signals to a target and receives the reflected modulated FM signals therefrom. A ranging circuit portion performs a quadrature demodulation on the reflected modulated FM signals and determines a range measurement based upon phase angle measurements derived therefrom. [A1558]

"Low cost short range radar"

A low cost radar system that employs monopulse beamforming to detect objects in the road-way both in elevation and azimuth. In one non-limiting embodiment, a beamforming receiver architecture includes a first beamforming device and a plurality of antennas coupled to the first beamforming device, and a second beamforming device and a plurality of antennas coupled to the second beamforming device. The first and second beamforming devices are oriented 90.degree. relative to each other so that the receive beams provided by the first beamforming device detect objects in azimuth and the receive beams provided by the second beamforming device detect objects in elevation. A first switch is provided to selectively couple the sum pattern signal from the first and second beamforming devices to one output line, and a second switch is provided to selectively couple the difference pattern signals from the first and second beamforming devices to another output line. [A1559]

"Detection and ranging appartus and detection and ranging method"

In a detection and ranging apparatus that performs direction-of-arrival estimation using a sensor array and that enlarges an effective aperture using a plurality of transmitting sensors, adverse effects associated with time division switching are eliminated, achieving high-accuracy measurement. A transmitter wave is spread in modulators by using mutually orthogonal codes, and the resulting transmitter waves are radiated from two transmitting sensors. Signals received by receiving sensors are each split by a splitter into two parts, which are then respectively despread in a demodulator by using the same codes as those used in the transmitter. [A1560]

"Terrain avoidance system and method using weather radar for terrain database generation"

An aircraft weather radar system can be used with a terrain avoidance system to provide a terrain database. The weather radar system includes a processor and/or other electronics coupled to an antenna. The processor determines terrain data based on weather radar returns received from the antenna. The processor can utilize a variety of techniques for determining terrain data or estimates. [A1561]

"Method and radar system for coherent detection of moving objects"

The present invention provides a coherent radar system based on a modification of standard non-coherent radar without Moving Target Indication. Typical radars in this class are Navigation radars which are mass produced with low cost components. These radars utilize a magnetron in the transmitter which is a random phase device. In the present invention, the received signal is extracted just prior to amplitude detection process (where phase information is lost) , and digitized using an analogue to digital converter providing coherent detection based on correlation between the transmitted pulse and the received signal. [A1562]

"Tracking waveform selection for multi-function radar"

The present invention relates to tracking waveforms in radar which minimizes the dwell time and energy in a tracking waveform while maintaining a specified track positional accuracy and consequently velocity accuracy. The present invention provides a method and apparatus for selecting a tracking waveform in a radar apparatus comprising determining a target range rate, determining a signal strength, determining the radiated frequency of the subsequent transmitted tracking waveform, and modifying the energy and pulse repetition frequency used on subsequent tracking waveforms on the basis of the determined target range rate, signal strength and next transmitted tracking waveform frequency. [A1563]

"Anti-interference microwave motion sensor"

A microwave motion sensor for protecting an area comprises an oscillator configured to generate a plurality of microwave signals, a random pulse generator configured to set a random pulse period for each transmitted microwave signal, an antenna configured to transmit the microwave signals and to receive reflected signals, and a signal processor coupled to the antenna through other circuitry, said signal processor is configured to process the reflected signals to determine a presence of a moving object in the protected area. [A1564]

"Imaging through silhouetting"

Improved microwave imaging using a reflector. By providing a reflective surface in the range of the imaging system, additional information is available for imaging objects. The relative surface provides silhouette information on the object, and increases the effective thickness of the object to aid analysis. [A1565]

"Mismatched filter"

The present solution provides methods and systems for realizing hardware efficient mismatched filters for pulse compression codes. for pulse compression codes with sufficiently small sidelobe structures, such as in the cases of odd length Barker codes, the proposed filters require a small number of adders and multipliers per output. This translates to significantly reduced chip-area and lower power consumption when implemented on a chip. In one aspect, the present application features a method for suppressing an undesired part of a waveform. The method includes filtering a signal via a filter. In one embodiment, the signal includes an expected waveform that can be represented as a sum of the desired part and the undesired part. The impulse response of the filter can be represented a sum of the desired part and a negative of the undesired part. [A1566]

"Radar device"

A radar device of FM pulse system, in which a pulsed radio wave with frequency modulated is transmitted or received, to calculate a distance to a target 203 and a relative velocity, comprising: range gate setting means 205 for determining a sampling timing every time a predetermined time period has passed from a transmission timing, sampling means 206 for making a sampling in a frequency up zone or frequency down zone in each range gate, and measurement time changing means 207 for setting a measurement data used as an input of Fourier transform based on sampling data obtained by the sampling means 206, and when letting a time period required to make a sampling of all measurement data a measurement time period, changing the measurement time period in each range gate. An optimum distance resolution and relative velocity resolution can be set based on the distance to a target. [A1567]

"Symmetrical multi-path method for determining the distance between two transmitter-receivers"

The invention relates to a symmetrical multi-path method for determining the spatial distance between two transmitter-receivers. Both transmitter-receivers set off at least one signal round in each case. A signal round comprises the steps: a) transmitting at least one request data frame of a first transmitter-receiver to a second transmitter-receiver at a request transmitting time (T.sub.TA1, T.sub.TB2) , b) receiving the request data frame at the second transmitter-receiver at a request receiving time (T.sub.RB1, T.sub.RA2) , c) transmitting a reply data frame from the second transmitter-receiver to the first transmitter-receiver at a reply transmitting time (T.sub.TB1, T.sub.TA2) , which has a respective reply time interval (T.sub.replyB1, T.sub.replyA2) from the request receiving time (T.sub.RB1, T.sub.RA2) and detecting the reply time interval, d) receiving the reply data frame at the first transmitter-receiver setting off the signal round and detecting an allocated reply receiving time (T.sub.RA1, T.sub.RB2) . The signal rounds are performed in such a way that the reply time intervals (T.sub.replyA2, T.sub.replyB1) are either identical or have a difference, in the case of performing more than one signal round set off by each transmitter-receiver an average difference, the amount of which is a maximum of 200 microseconds. [A1568]

"Detection of a concealed object"

Disclosed are systems, methods, devices, and apparatus to determine if a clothed individual is carrying a suspicious, concealed object. This determination includes establishing data corresponding to an image of the individual through interrogation with electromagnetic radiation in the 200 MHz to 1 THz range. In one form, image data corresponding to intensity of reflected radiation and differential depth of the reflecting surface is received and processed to detect the suspicious, concealed object. [A1569]

"Sensor fusion for model-based detection in pipe and cable locator systems"

Line locator systems that fuse traditional sensors used in a combined pipe and cable locator (electromagnetic coils, magnetometers, and ground penetrating radar antennas) with low cost inertial sensors (accelerometers, gyroscopes) in a model-based approach are presented. Such systems can utilize inexpensive MEMS sensors for inertial navigation. A pseudo-inertial frame is defined that uses the centerline of the tracked utility, or an aboveground fixed object as the navigational reference. An inertial sensor correction mechanism that limits the tracking errors over time when the model is implemented in state-space form using, for example, the Extended Kalman Filter (EKF) is disclosed. [A1570]

"Remote sensing of wave heights using a narrowband radar arrangement"

A narrowband radar arrangement having a radar transmitter and a radar receiver mounted above a targeted water surface to monitor and determine a sea state of the targeted water surface. Fixed frequency signals are transmitted by the transmitter and received by the receiver, via a direct path and via a forward scattered path off the targeted water surface. An interference pattern of interfering direct path signals and forward scattered signals is used to determine an instantaneous height of the water surface and also to determine the sea state of the targeted water surface. [A1571]

"Method for measuring the muzzle velocity of a projectile or the like"

It is proposed to use the gun barrel or launcher tube or the muzzle brake as a waveguide, which, however, is operated at a frequency that is below the cutoff frequency of the relevant waveguide mode. The transmit coupler excites the relevant waveguide mode. An oscillator generates the signal, which is then sent to the transmit coupler. The waveguide and the projectile form a system in which the electromagnetic field at the receive coupler is influenced by the position of the projectile. The characteristic change over time of the strength of the electromagnetic field at the location of the receive coupler that results from the change in the distance between the projectile and the receive coupler is measured and used to determine the muzzle velocity. [A1572]

"Ranging and communication multifunction system"

A ranging and communication multifunction system including a transmission unit and a receiving unit, and integrates two functions of ranging and communication in which the transmission unit includes a transmission circuit, a carrier wave modification device, and a transmission antenna. The receiving unit includes a receiving circuit, a wave detector, a low noise amplifier, and a receiving antenna, and a data modulation performed in the transmission circuit uses a PPM system. Thus, the receiving circuit provides a ranging circuit and a communication separately, so that the demodulation processing of ranging and communication can be performed in parallel. [A1573]

"System and method for collection of global AIS and radar track information"

Methods and apparatuses are described that enable the automatic collection of maritime vessel location information within a global or regional framework by using a minimum network of vessels outfitted with non-intrusive AIS data collection systems. The network of vessels may comprise standard ships operating within their normal commercial or private tasks. By utilizing these non-specially tasked vessels and augmenting the received AIS reports with onboard radar/navigation information, accurate global or regional tracking information can be generated at a centralized location without incurring large costs. [A1574]

"Systems and methods for supplemental weather information presentation on a display"

An embodiment of the supplemental weather display system presents supplemental weather information on a display in a craft. An exemplary embodiment receives the supplemental weather information from a remote source, determines a location of the supplemental weather information relative to the craft, receives weather information from an on-board radar system, and integrates the supplemental weather information with the weather information received from the on-board radar system. [A1575]

"Short-range radar and control method thereof"

A transmitting unit of a short-range radar includes a first pulse generating unit, a second pulse generating unit, an oscillator and a switch, and while complying with the spectrum mask specified for a UWB short-range radar, emits a predetermined short pulse wave not interfering with the RR prohibited band or the SRD band into the space. The first pulse generating unit outputs a first pulse having the width larger than the width of the short pulse wave in a predetermined period. The second pulse generating unit outputs a second pulse having the width corresponding to the width of the short pulse wave during the period when the first pulse generating unit outputs the first pulse. The oscillator oscillates only during the period when the first pulse generating unit outputs the first pulse, and the switch is turned on and passes the output signal from the oscillator only during the period when the second pulse generating unit outputs the second pulse, thereby to emit the output signal from the switch into the space as the predetermined short pulse wave. [A1576]

"Remote sensing of wave heights using a broadband radar arrangement"

A broadband radar arrangement having a radar transmitter and a radar receiver mounted above a targeted water surface to monitor and determine a sea state of the targeted water surface. Spectrally spaced signals are transmitted by the transmitter and received by the receiver, via a direct path and via a forward scattered path off the targeted water surface. An interference pattern of interfering direct path signals and forward scattered signals is used to determine an instantaneous height of the water surface and also to determine the sea state of the targeted water surface. [A1577]

"Space-borne altimetry apparatus, antenna subsystem for such an apparatus and methods for calibrating the same"

The present invention is directed to a space-borne altimetry apparatus having a first receiving antenna, pointing to outer space, for receiving at least one signal emitted by a remote satellite emitter via a direct path, a second receiving antenna, pointing to the Earth, for receiving said signal via an indirect path including a reflection from the Earth surface, and a signal processing means for computing a distance of the apparatus from a specular reflection point of the signal on the Earth surface by cross-correlating the signals received by said first and second antennas, wherein both the first and second receiving antennas are high-gain steerable antennas, and wherein the apparatus may also include antenna control means for steering at least one receiving lobe of the first antenna toward the remote satellite emitter, and at least one receiving lobe of the second antenna toward a specular reflection point on the Earth surface. [A1578]

"Predictive and adaptive weather radar detection system and method"

A method of detecting weather on an aircraft uses a weather radar system. The method includes determining a location of a reflective radar target, accessing a database having stored information relating to ground clutter of a reflective radar target, retrieving weather radar information associated with the location, and automatically adjusting the weather radar return threshold in response to the information. The method can adjust a threshold for a weather radar display, adjust a weather radar signal gain, adjust a tilt angle of the weather radar, or adjust a ground clutter suppression threshold. The method can be implemented by hardware and/or software. [A1579]

"In-vehicle radar system"

An in-vehicle radar system, which transmits an electric wave toward a target object and measures the distance between a subject vehicle and the target object, based on the electric wave that has been reflected by the target object and is received by the in-vehicle radar system, includes subject vehicle-speed determination means for determining whether or not the subject vehicle is in a halt state or moving at a predetermined speed or lower, transmission-output control means for setting transmission output smaller than that for the case where the subject vehicle is moving, when the subject vehicle-speed determination means detects that the subject vehicle is in a halt state or moving at the predetermined speed or lower, and reception-sensitivity control means for setting a reception gain amount larger than that for the case where the subject vehicle is moving. [A1580]

"Radar detector with position and velocity sensitive functions"

A GPS enabled radar detector dynamically handles radar sources based upon previously stored geographically referenced information on such sources and data from the GPS receiver. The detector includes technology for determining the location of the detector, and comparing this location to the locations of known stationary sources, to improve the handling of such detections. The detector may ignore detections received in an area known to contain a stationary source, or may only ignore specific frequencies or may handle frequencies differently based upon historic trends of spurious police radar signals at each frequency. Notification of the driver will take on a variety of forms depending on the stored information, current operating modes, and vehicle speed. [A1581]

"Integrated frequency calibration architecture"

In an exemplary embodiment, a free running VCO has two modes: a normal operating mode and a calibration mode. In the calibration mode, the free running VCO is phase lock looped with itself instead of a calibration VCO. Furthermore, in an exemplary embodiment, a tuning voltage for the free running VCO is adjusted to offset any tuning error. In addition, in various embodiments a reference crystal oscillator used in the phase lock loop is located on a DSP module instead of on the RF module. In yet another exemplary embodiment, the free running VCO is the only high frequency VCO on a radio frequency module. [A1582]

"Traffic speed enforcement based on wireless phone network"

The present invention includes systems and methods for detecting a speed limit violation based on the movement of a cell phone in a moving vehicle. The system and method determine whether a speeding violation has occurred based periodic cell phone location data, the time between a cell phone's presence at one location and the next, and the speed limit of the section of a section of road that the cell phone could be located on. Embodiments of systems and methods of the invention detect whether a moving vehicle may be part of a public transit system, in which case the corresponding cell phones are removed from consideration. The system and method also include generating a speeding ticket for a car determined to have violated a corresponding speed limit, keeping a record of a speeding violation, and sending a request to settle the ticket if it is not paid on time. Also included in the invention are embodiments of systems and methods that detect whether a cell phone moving in a car is in engaged in a call, and if so, generating a ticket for a driving-while-talking violation. [A1583]

"Methods and apparatus for log-FTC radar receivers having enhanced sea clutter model"

Methods and apparatus to provide Log-Amp-detected radar sea clutter voltage modeled by a polynomial, such as a cubic polynomial, and using that model as a basis for sea clutter reduction filtering. In an exemplary embodiment, a navigational radar includes an STC filter design based on the cubic sea clutter modeling. [A1584]

"Combined imaging and distance monitoring for vehicular applications"

Vehicular arrangement for obtaining information about objects exterior to the vehicle includes at least one combined imaging and distance measuring system arranged along an edge or a side of the vehicle, each combined system including an infrared illuminator for directing infrared illumination outward from the vehicle, an imager sensitive to infrared illumination and visible light, the imager being arranged to form images of an environment around the vehicle and thereby enable identification of objects in the images, a radar or laser radar system arranged to simultaneously determine a distance between the vehicle and objects identified in images obtained by the imager with the identification of the objects in the images. A reactive system is arranged on the vehicle to consider both the identification of the objects and their distance from the vehicle and react accordingly. [A1585]

"Method and device for object detection in the case of a vehicle"

A method and device for object detection in the case of a vehicle equipped with an object-detection system, the object-detection system emitting electromagnetic radiation and receiving radiation reflected off objects within the detection range, and the radiation reflected off a detected object, which was additionally reflected off an object extending along the roadway, is analyzed. The analysis consists of a plausibilization in which the directly measured object reflections are verified using the indirect object reflections, or in that the analysis consists of utilizing the indirect object reflections for the further object detection if reflections from a previously detected object are no longer measurable. [A1586]

"Monostatic planar multi-beam radar sensor"

A monostatic multi-beam radar sensor for motor vehicles, having a group antenna, a planar lens having multiple inputs, and a homodyne mixer system, wherein the mixer system comprises multiple transfer mixers that are connected in parallel to the inputs of the lens. [A1587]

"Radar system for motor vehicles"

A radar system for motor vehicles, having a radar sensor and an evaluation device for measuring distances and relative velocities of objects in the surrounding field of the vehicle, and a collision detection device, which, on the basis of the measured distances and relative velocities, recognizes an imminent collision and delivers data on the expected time of collision and the impact velocity to a precrash system. The radar sensor is switchable by the collision detection device to a velocity measurement mode in which a more precise measurement of the relative velocity is made. [A1588]

"UWB distance measurement system and method of driving the same"

The present invention relates to a UWB distance measurement system and method of driving the system. The system includes a reception antenna for receiving a signal, which is output from a transmission unit, is reflected from a target and is incident on the reception antenna, a UWB amplifier for amplifying the received signal and generating a first signal, a reference waveform generator for generating a reference waveform which is a reference for analysis of the first signal, a window function generator for generating at least one window function that is applied to the first signal, a correlator for correlating the first signal with the window function output from the window function generator, and generating a second signal which is a revised frequency response of the first signal, and a delay time detector for detecting a delay time component in the second signal. [A1589]

"Radar system"

A scanning radar system suitable for detecting and monitoring ground-based targets includes a frequency generator, a frequency scanning antenna, and a receiver arranged to process signals received from a target so as to identify a Doppler frequency associated with the target. The frequency generator generates sets of signals, each set having a different characteristic frequency, and includes a digital synthesiser arranged to modulate a continuous wave signal of a given characteristic frequency by a sequence of modulation patterns to generate one set of signals. The frequency scanning antenna cooperates with the frequency generator to transceive radiation over a region having an angular extent dependent on the generated frequencies. Digital synthesiser techniques capable of precise frequency generation and control are combined with passive frequency scanning and Doppler processing techniques, enabling accurate control of range and scan rates, and optimisation of range cell size for factors such as slow and fast target detection and Signal to Noise ratio, so that targets can be detected at distances considerably farther away than is possible with known systems having similar power requirements. [A1590]

"Millimetre and sub-millimetre wave illumination system"

An improved millimeter wave illumination system includes at least one primary source of millimeter wave radiation, a reflecting surface and a baffle comprising a plurality of exit apertures arranged such that at least some of the radiation from the source is reflected from the reflective surface before proceeding to the baffle, characterized in that means are incorporated for generating a plurality of radiation field states within a pre-determined time interval. The baffle, source and reflector are preferably packaged into a container with the exit apertures providing an illumination output. The generation of the plurality of radiation field states provides an illumination at the illuminator output that is less spatially variable when integrated over the pre-determined time interval. Embodiments of the invention show means for generating the plurality of radiation field states including relative movement of the reflective surface, variable positioning of the source with respect to the reflective surface, and including multiple sources within a single system. [A1591]

"Object detection device"

An object of the present invention is to provide an object detection apparatus capable of detecting an object at high precision in accordance with the type of the object. The object detection apparatus of the present invention comprises: object position detection means 2, 22, 3, 23 for detecting the positions of objects, object type estimating means 24 for estimating the types of the objects, and object estimating means 24 for integrating a plurality of detection results for positions within a search area obtained by the object position detection means 2, 22, 3, 23 and thereby estimating the sizes of the objects, the object detection apparatus of the present invention being characterized in that the search area is set based on the types of the objects estimated by the object type estimating means 24. Moreover, the object detection apparatus of the present invention is characterized in that the object position detection means 2, 22, 3, 23 detects the positions of the objects by using a plurality of position detection criteria, that the object type estimating means 24 estimates the types of the objects based on the position detection criteria, according to which the object position detection means 2, 22, 3, 23 have been able to detect the positions of the objects, and that the search area is set based on the position detection criteria, according to which the positions of the objects have been detected. [A1592]

"Signal acquisition and method for ultra-wideband (UWB) radar"

An acquisition channel (20) includes a UWB sampler block (21) coupled to an analog integration block (22) further coupled to a digital integration block (24) via an analog/digital converter (23) . for each range cell the UWB sampler block (21) repeatedly samples the received signal by tuning the sampling instants to the range cells to be acquired. The acquisition channel (20) is further coupled to a processor (26) and a database (25) . [A1593]

"Vessel monitoring system"

The vessel monitoring system has, in a trial navigation by provisionally setting a value of the speed of the own vessel arbitrarily, a display unit immediately display an Obstacle Zone by Targets (OZT) corresponding to the speed of the own vessel. The vessel monitoring system includes a calculator for calculating an Obstacle Zone by Targets, a display unit for displaying the Obstacle Zone by Targets obtained by the calculation by the calculator, and an integrated controller for processing trial navigation that integrally controls mutually cooperated processing of calculation by the calculator and display by the display unit, in a trial navigation by provisionally setting a value of the speed of the own vessel arbitrarily, so that the calculator calculates an Obstacle Zone by Targets corresponding to the arbitrarily and provisionally set value of the speed of the own vessel, and the display unit displays the result of the calculation. [A1594]

"Steerable directional antenna system for autonomous air vehicle communication"

A system and method for communication with an autonomous air vehicle are provided. The system comprises a steerable antenna array including a plurality of directional antenna elements each selectable to receive a video signal from the air vehicle. An antenna control unit is operatively coupled to the antenna elements and includes a magnetometer for determining an orientation for each of the antenna elements. A ground control station is in operative communication with the antenna array and comprises a ground data terminal in operative communication with the antenna control unit, and an operator control unit in operative communication with the data terminal and the antenna control unit. The operator control unit is configured to obtain positions of the air vehicle and the ground control station from the data terminal. The operator control unit is further configured to determine which of the antenna elements to select by utilizing the positions of the air vehicle and the ground control station, and the orientation of one of the antenna elements. [A1595]

"Radar apparatus"

Marine radar apparatus propagates groups of three pulses A, B, C of the same amplitude but different widths, the shorter pulse enabling detection of close range targets and the longer pulses enabling detection of longer range targets. The pulses are encoded differently with the short pulse A being a continuous wave signal and the longer pulses being modulated with a frequency modulated chirp, one pulse C being chirp up and the other B being chirp down. The power of the radar need only be about 190 w. [A1596]

"Object information acquisition apparatus and object information acquisition method"

An object information acquisition apparatus for acquiring information on the inside of an object includes an electromagnetic wave generation unit capable of outputting a terahertz wave and of changing the output intensity, an irradiation unit that irradiates an electromagnetic wave onto an object, a scanning unit and a detection unit that detects the electromagnetic wave irradiated onto the object. The scanning unit changes the relative positions of the irradiated electromagnetic wave and the object. The detection unit detects the electromagnetic wave transmitted through or reflected by the object as a result of interaction of the object and the electromagnetic wave. [A1597]

"Object recognition apparatus for vehicle and distance measurement apparatus"

In an object recognition apparatus for a vehicle which uses intensities of reflected waves from reflecting objects to make a recognition on whether a reflecting object is a vehicle or a non-vehicle, a plurality of transmission waves are emitted to receive a plurality of reflected waves from the reflecting objects, and a decision is made as to whether or not the reflecting object producing the plurality of reflected waves is a unitary reflecting object. If the decision shows a unitary reflecting object, the highest intensity of intensities of the reflected waves from the unitary reflecting object is compared with a reference intensity to makes a decision on whether the reflecting object is a vehicle or a non-vehicle. This enables univocally making a decision for each unitary reflecting object as to whether the reflecting object is more likely to be a vehicle or to be a non-vehicle, thus improving the recognition accuracy. [A1598]

"Method and system for presence detection"

A method for presence detection using a microwave transmitter and a microwave receiver, the method including generating a sequence of clock pulses by means of a pulse generator, feeding the clock pulses to a clocked circuit arranged to generate a sequence of first pulses of a first pulse length and a sequence of second pulses of a second pulse length, each one of the first and second pulse lengths being related to a predetermined number of the clock pulses, periodically actuating the microwave transmitter by means of the sequence of first pulses, periodically actuating the microwave receiver by means of the sequence of second pulses, and determining whether an object is present in the detection volume based on microwave radiation being received by the microwave receiver. A system for such presence detection is also disclosed. [A1599]

"Blood flow imaging"

Blood-flow image display equipment for displaying a CFM image that is not affected by a motion of a tissue in an object area during capturing of images or is affected in a reduced manner. The blood-flow image display equipment has the following components: a transmitting controller for controlling transmission triggers of a signal for B-mode and a signal for CFM based on a velocity of motion of an object, an ultrasonic transducer in which piezoelectric ultrasonic transducers each for transmitting/receiving an ultrasonic wave to/from the object are arranged in the form of an array, a B-mode image construction unit for constructing a B-mode image with received signals, a motion detector for measuring a motion vector of the object using the B-mode image, a receiving unit for CFM signal for receiving the signal for CFM from the ultrasonic transducer, a time-series signal storage unit for CFM that collects a CFM measurement region located in the same area of the object based on the motion vector measured by the motion detector and stores them in memory in time sequence, and an autocorrelation processing unit for performing autocorrelation processing on time-series CFM signals. [A1600]

"Determining positional information"

Apparatus for determining positional information relating to an object, comprising: means for receiving, comprising a plurality of receiving elements, detection means for detecting signals received at the receiving elements and for generating output signals representative of the received signals, and processing means operable to apply, for each receiving element, a process to the output signal generated from the signal received at that receiving element separately from any output signal generated from a signal received at any other receiving element, so as to obtain a respective value of a parameter representative of the signal received at that receiving element, the processing means being further operable to compare the values of the parameter thus obtained so as to, obtain positional information relating to the object. [A1601]

"Active imaging system that recaptures and processes a reflected illumination beam"

In accordance with yet another aspect of the present invention, an active imaging system is provided for imaging a target of interest. An imaging assembly includes a light source and an optical assembly comprising a plurality of passive optical components. The optical assembly divides received light into a first beam, having a first polarization and a second beam, having a second, orthogonal polarization, directs the first and second beam along respective first and second optical paths within the optical assembly, and recombines the first and second beams into a combined beam. A sensor detects the combined beam. [A1602]

"Vehicle surroundings monitoring apparatus and traveling control system incorporating the apparatus"

A vehicle surroundings monitoring apparatus inputs signals indicative of images from a stereoscopic camera, a vehicle speed, a steering wheel angle and a yaw rate and estimates a traveling path of an own vehicle according to vehicle forward information and traveling conditions of the own vehicle. The apparatus establishes a traveling region A according to this traveling path and further establishes a traveling region B based on at least either of the traveling region A and road information. It is judged whether a detected solid object is a preceding vehicle or a tentative preceding vehicle according to the state of existence of the object in the traveling regions A, B and the preceding vehicle is outputted to a traveling control unit. [A1603]

"Method for locating the surface of a polymer particle bed"

A method for determining the level of a bed of polymer particles in a vessel comprising providing water wet polymer particles and employing a guided wave radar probe unit carrying a pair of radar active probes spaced from the guided wave radar probe unit by a radar inactive member, and positioning the radar inactive member so that polymer particles that are introduced into the vessel first encounter the radar inactive member. [A1604]

"Method for the operation of a radar system"

The invention relates to a method for operating a radar system (100) especially of a motor vehicle (200) , comprising at least one first sensor module (110a) and at least one additional sensor module (110b) . A detection range (A) of the first sensor module (100a) at least partly overlaps a detection range (B) of the additional sensor module (110b) while the first sensor module (100a) receives a transmit signal transmitted by the additional sensor module (110b) in a monitoring mode (305) in order to obtain information about the operating condition of the additional sensor module (110b) . [A1605]

"Radar device"

A radar device can reliably, and rapidly detect dirt adhered to a radome surface without misdetection. The radar device includes a transmit/receive shared antenna (306) that transmits an electric wave to an object and receives a reflected wave that has been reflected from the object, a mixer (307) that mixes a transmission signal and a reception signal together to generate a beat signal, and a signal processing unit (312) that measures a distance to the object and a relative speed of the object on the basis of the beat signal. The transmit/receive shared antenna (306) modulates an unmodulated wave into a pulse and transmits the pulse modulated wave at a specific timing. In the case where the unmodulated pulse is transmitted, the beat signal that has been generated by the mixer (307) is converted into a digital voltage value by an A/D converter (310) . The signal processing unit (312) detects the dirt that is adhered to the radome (314) of the transmit/receive shared antenna (306) on the basis of an output of the A/D converter 310. [A1606]

"Statistical-deterministic approach to natural disaster prediction"

A combined statistical-deterministic approach to methods and systems for assessing risk associated with natural disasters, in particular, hurricane wind risk. One example of a method of predicting wind speed distribution within a predetermined distance from a point of interest includes steps of statistically synthesizing a large plurality of wind storm tracks that pass within a predetermined radius of the point of interest, running a deterministic simulation of wind intensity along each one of the large plurality of wind storm tracks to produce an output representative of wind speed distribution along each track, and using the output to estimate an overall wind speed probability distribution from a combination of the wind speed distributions along each track within the predetermined distance from the point of interest. [A1607]

"Method for analysing a substance in a container"

Method and apparatus for analyzing a substance in a container, the method comprising the steps of: disposing antenna means (3) at a predetermined geometrical distance (L) from a container portion (13) , transmitting a signal from said antenna means through a surface portion (12) of the substance towards said container portion, receiving a first reflected signal in said antenna means from said container portion, determining a geometrical distance (L1) from the surface portion to the container portion, varying the frequency of the transmitted signal to determine a first phase displacement between the transmitted signal and the first reflected signal, determining an optical distance from the surface portion to the container portion based on the first phase displacement, and determining the index of refraction (nt) of said substance based on the optical and geometrical from the surface portion to the container portion. [A1608]

"Control target recognition system and vehicle object detection system"

There is provided a system in which when a gate having a reflection level of a threshold or higher and having been recognized as a control target by last time is not recognized as the control target this time, the gate is assumed to be actually detected, and extrapolation device extrapolates the gate (see .largecircle.) up to a predetermined number of times (five times) , wherein when the gate is a stationary object, and a reflection level of the gate at the next detection (Time 6) predicted from a reflection level at the previous detection (Time 4) and a reflection level at the current detection (Time 5) is lower than a detection threshold (see .quadrature.) , the limit of the number of extrapolations by the extrapolation device is reduced from five to two. Thus, the number of extrapolations is reduced of the gate whose reflection level is suddenly reduced as a subject vehicle approaches and that is estimated not to be a control target, and unnecessary vehicle control for the gate can be prevented to eliminate discomfort of a driver. [A1609]

"Method and apparatus for clutter filtering staggered pulse repetition time signals"

A method for clutter filtering staggered pulse repetition time data signals is provided. The method comprises the steps of receiving a plurality of staggered pulse repetition time data signals. The data signals may comprise one or more desired signals and one or more clutter signals. The method further comprises separating the staggered pulse repetition time data signals into a first separated data sequence and a second separated data sequence. The first and second separated data sequences comprise equally spaced data samples. The method also comprises the step of filtering the one or more clutter signals from the first and second separated data sequences. [A1610]

"Sidelobe blanking characterizer system and method"

According to a particular embodiment, a method for evaluating different antenna designs includes receiving different sets of antenna patterns representative of the different antenna designs from a corresponding number of data sources. The different sets of antenna patterns are applied to a characterizer component for generating a sidelobe banking (SLB) characteristic map for each set of antenna patterns received. A SLB effectiveness chart is generated from the SLB characteristic map. A best antenna weighting set is selected based on which auxiliary antenna pattern exhibits the best performance. The best of antenna weighting factors are used for designating the antenna design having superior SLB performance characteristics. [A1611]

"High resolution ranging apparatus and method using UWB"

Provided is a high resolution distance ranging apparatus using an ultra-wideband (UWB) communication. The apparatus includes: a first spectrum analyzer for extracting a frequency component corresponding to multipath time delay from a reception signal, a second spectrum analyzer for acquiring a noise subspace of the extracted frequency component and extracting a frequency component where maximum power is located from a frequency spectrum based on the noise subspace, a time of arrival (TOA) extractor for extracting TOA based on the frequency component where maximum power is located. [A1612]

"Method for generating a representation of an atmospheric vortex kinematic structure"

A method for generating a representation of a kinematic structure of an atmospheric vortex is provided. The method comprises receiving a plurality of signals from a Doppler radar. The signals are reflected at a plurality of pulse volumes. The method also comprises measuring a plurality of Doppler velocities based on the received signals. A plurality of scaled Doppler velocities are calculated representing the plurality of measured Doppler velocities, the radial distance between the Doppler radar and the pulse volume where the Doppler velocity is measured, and the distance between the radar and a first estimated atmospheric vortex center. The method also comprises generating a representation of the kinematic structure of the atmospheric vortex using the plurality of scaled Doppler wind velocity values. [A1613]

"System and method for using iridium satellite signals for meteorological measurements"

A method for obtaining weather related information for a portion of the Earth's atmosphere between a mobile platform traversing over a predetermined surface portion of the Earth, and at least one satellite from a satellite constellation. The method involves modifying at least one satellite from the constellation of satellites to include time and location information in wireless signals that are transmitted in real time by the one satellite. The mobile platform receives the wireless signals from the one satellite. An occultation system carried on the mobile platform analyzes the time and position information, in addition to location information pertaining to a real time location of the mobile platform, and to derive real time atmospheric weather related information for a geographic area between the mobile platform and the one satellite. [A1614]

"Radar system with an active lens for adjustable field of view"

An example radar system for a vehicle comprises a radar antenna, operable to produce a radar beam, and a lens assembly including at least one active lens, the radar beam passing through the lens assembly. The radar beam has a field of view that is adjustable using the active lens. In some examples, the active lens comprises a metamaterial, the metamaterial having an adjustable property such as an adjustable negative index, the field of view being adjustable using the adjustable property of the metamaterial. [A1615]

"Method for reducing interference signal influences on a high-frequency measurement device and high-frequency measurement device"

A method for reducing interference signal influences on a high-frequency measurement device, in particular a method for operating a high-frequency position finder, in which an analog measurement signal (22) detected by a receiver unit (23) of the high-frequency measurement device is supplied to at least one analog/digital converter (28) of an evaluation unit for the measurement signal. According to the present invention, the scan rate of the at least one analog/digital converter (28) is varied as a function of an interference signal measurement value correlated with the interference signals. [A1616]

"Method and system for measuring flow layer velocities using correlation velocity measuring sonar"

The present invention discloses a method and a system for measuring flow layer velocities using correlation velocity measuring sonar. The present invention provides a new theoretical expression for fluid medium sonar array temporal and spatial correlation function, the velocities of each flow layer are derived by fitting experimental data and a theoretical function, or fitting absolute value operated and localized experimental data and a theoretical function. The fluid medium sonar array temporal and spatial correlation function of the present invention is succinctly expressed by Kummer function, and well coincided with the experiments. This function is applicable not only to far field region, i.e. planar wave region, but also Fraunhofer region, i.e. spherical wave region. The present invention has the merits of high measurement accuracy, small calculation load, good robustness and fast convergence. [A1617]

"Method for estimating the width of radar objects"

In a method for estimating the width of radar objects in a position finding system for motor vehicles, which has at least two angle-resolving radar sensors, the reflection points positioned by several of the radar sensors, which are to be assigned to the same object on the basis of their distance data and relative velocity data, are combined into a group, lateral positions of the reflection points from this group are calculated, the difference of the lateral positions is calculated for various pairs of these refection points, and the maximum of these differences is sought out to determine an estimated value for a minimum width of the object. [A1618]

"Storm top detection and prediction"

A radar system is configured to predict future storm cell characteristics and display an indication of the characteristics on an electronic display. The system has an antenna configured to receive radar returns from radar scans of storm cells. The system includes processing electronics configured to determine a characteristic of a first storm cell from the radar returns and identify at least one second storm cell. The at least one second storm cell is in the same weather system as the first storm cell. The processing electronics are configured to determine the characteristic for the at least one identified second storm cell, compare the characteristic of the first storm cell with the characteristics of the at least one second storm cell, determine a growth rate of the first storm cell, and calculate a predicted height of the first storm cell at a future time based on the comparison and determined growth rate. [A1619]

"Method for small-scale fishing boat equipped with radar receiver to avoid ship collision and the radar receiver therefor"

A method for small-scale fishing boat to avoid ship collision includes the steps of: (1) equipping the small-scale fishing boat with a radar signal receiver for scanning and receiving radar signals transmitted by other ships within the receiving range of the radar signal receiver, (2) using a monitoring computer having a Marine Geographic Information System (Marine GIS) installed thereon to obtain at real time information about the distance, bearings, and etc. of other approaching ships in order to monitor the dynamic conditions of the approaching ships within the fishing boat's operating water area, and (3) actuating a collision warning mechanism based on the intensities of received radar signals when there is more than one approaching ship, so that the small-scale fishing boat can timely receive a collision warning to reduce the risk of collision and maintain safe and smooth voyage on the sea. [A1620]

"Traffic radar with target duration tracking"

A traffic radar utilizes digital signal processing (DSP) to determine targets based on signal strength histories. From these histories, a target vehicle having the strongest Doppler return signal is identified and its speed is displayed, and a target vehicle having the highest frequency return signal is identified and its speed is displayed. The traffic radar may also display the relative strength of the strongest return signal and the relative strength of the highest frequency return signal, thereby showing a comparison of the strengths of the return signals from the target vehicles. [A1621]

"System and method for presenting wind speed information"

A system and method for presenting wind speed information in a manner so as to be easily understood and appreciated by viewers of televised weather report presentations and the like. Wind speed information is presented as two or three-dimensional wind speed contour lines, delineating geographic areas corresponding to different wind speeds, overlaid on a geographic map display either alone, or in combination with radar reflectivity information. Wind velocity information received from a weather radar system, such as NEXRAD, relative to the weather radar is converted to absolute wind speed information for display. [A1622]

"Radar image processor and method of radar image processing"

In a radar image processing device and a radar image processing method which can accurately extract a change of a ground surface, a communication interface unit (10) obtains a plurality of radar image data of a same observation target obtained at different times and stores in a radar image storage unit (12) , and a registration processor (14) reads the plurality of radar image data from the radar image storage unit (12) and registrates the radar image data with respect to each other. Then, a characteristic value calculating unit (18) calculates a plurality of characteristic values indicating a state of a ground surface which is the observation target based on the positioned radar image data. A change candidate region extracting unit (34) extracts change candidate regions for each of the characteristic values, and a judging unit (36) extracts a region of land cover change of the observation target from the change candidate regions using a threshold value, an extracting condition, and a judging function determined by a judgment method determining unit (24) . [A1623]

"Universal frequency generation and scaling"

Generation of electromagnetic or other waves of any frequency, coherence, modulation, power, etc. and for scaling such waves in frequency by any factor. Generation is achieved by incorporating an available source of desired coherence, modulation and power properties at some band of frequencies and scaling to the desired frequencies. for scaling, a continuously varied frequency selection mechanism, which results in source-distance dependent frequency scaling as described in copending applications titled "Passive distance measurement using spectral phase gradients" and "Distance-dependent spectra with uniform sampling spectrometry", is combined with a means of determination, or prior knowledge, of the source distance. This distance, from the source to the frequency scaling mechanism, may be shortened with a refractive or dispersive medium, or varied for fine tuning of the frequency scale factor, and this variation may be effected via electrooptic or magnetooptic properties of the medium. [A1624]

"Motion compensation for radar imaging"

In one embodiment, a radar is provided that is configured to construct an image of a target within or adjacent to a substrate according to scan points associated with a surface of the substrate while the radar is scanned in a first direction. The radar includes a transceiver that transmits radar pulses and receives reflected radar pulses using an antenna directed at the surface, and an image processor configured to use a plurality of processed received radar pulses to generate an image portion according to each scan point, and at least one laser range finder being configured to illuminate a first surface portion within a surface portion illuminated by the antenna and to illuminate a second surface portion displaced in the first direction from the first surface portion, the laser range finder determining a first range between the laser range finder and the first surface portion and determining a second range between the laser range finder and the second surface portion, wherein the radar is configured to process the first and second ranges to determine a range translation of the radar during the scan in the first direction, and wherein the image processor is further configured to compensate the image portions according to the determined range translation so at construct an image of the target. [A1625]

"Apparatus for identifying target satellite in satellite communication antenna and method thereof"

Provided is an apparatus and method for identifying a target satellite in a satellite communication antenna. The apparatus includes: a power splitting unit for splitting a signal inputted through the satellite communication antenna to more than two signals, a tuner unit for receiving the split signals from the power splitting unit and passing only signal of a predetermined channel frequency band, an analog-to-digital converting unit for converting each of signal intensities passed in the tuner unit to a digital value, and a controlling and identifying unit for determining whether a satellite traced by the satellite communication antenna is a target satellite using each of the signal intensities of the predetermined channel frequency band inputted from the A/D converting means, and controlling an orientation direction of the satellite communication antenna. [A1626]

"Detecting and ranging apparatus and detecting and ranging program product"

A detecting and ranging apparatus and a program product obtain a correct relative velocity vector by a simple calculation based on a relative distance etc. obtained by a plurality of detectors such as a radar etc. by including: two relative distance measurement units receiving a reflected wave of a transmitted electromagnetic wave by an object to be detected, and thereby measuring a relative distance to the object to be detected, arranged at with each other different position, and an actual velocity vector calculation unit calculating an actual velocity vector of the object to be detected moving with an angle made in a direction from either relative distance measurement unit to the object to be detected based on the relative distances measured by the relative distance measurement units. [A1627]

"Marine radar systems and methods"

Marine radar systems and methods for producing low power, high resolution range profile estimates. Non-linear Frequency Modulation (NLFM) pulse compression pulses are frequency stepped to form a low power, wide-bandwidth waveform. Periodically, calibration filters are determined and applied to return signals for correcting non-ideal effects in the radar transmitter and receiver. [A1628]

"Velocity extraction"

A method of extracting a radial velocity characteristic of a target from coherent pulse bursts comprising the steps of applying to data a `best fit` model of the echo returns from a target in the presence of clutter to obtain a residue (error) value and minimising the error value by a predetermined method to give the best fit value for the target radial velocity. The method enables more information to be retrieved from coherent bursts than conventional methods and therefore greatly enhances performance of radiation pulse echo detection. [A1629]

"Systems and methods for monitoring river flow parameters using a VHF/UHF radar station"

Systems and methods are described for monitoring the surface flow velocity and volume discharge of rivers and channels using a VHF/UHF radar located in operative relationship with a riverbank. This frequency region allows precise estimation and removal of the Bragg wave velocity, it also is matched to the short wind-wave roughness periods existing on river surfaces so that operation is possible nearly all the time. Methods of bearing determination are also disclosed. Up/downriver surface velocity profiles vs. distance across the river may be constructed from maps of the radial velocity component from a single radar at thousands of points within the radar's coverage. Methods to compensate for Doppler aliasing under high flow conditions are also shown. [A1630]

"Method and apparatus for measuring distance between a target and a receiver in a ranging system"

A method of measuring distance between a target and a receiver in a ranging system may comprise transmitting a first pulse at a first time determined by a sampling clock in a receiver, receiving the first pulse, sampling the first pulse at a predetermined amplitude threshold using the sampling clock and determining the time of arrival of the first pulse in terms of a number of periods of the sampling clock after the first pulse was transmitted. This may be repeated for a second pulse and the average times of arrival of the first and second pulses are determined to obtain an averaged estimated time of arrival. The distance between the target and the receiver may be determined by multiplying the averaged estimated time of arrival by the speed of propagation of the transmitted pulses. There is also disclosed an apparatus for measuring distance. [A1631]

"Sensor sweeper for detecting surface and subsurface objects"

An apparatus and method for detecting surface and subsurface objects is provided. A sweeping mechanism comprising a sensor is connected to a mounting frame. The mounting frame is connected to a motorized host platform. The sweeping mechanism sweeps the sensor according to a predetermined footprint when the motorized host platform either pulls or pushes the mounting frame. A signaling mechanism connected to the sensor produces a signal when the sensor senses an object beneath the surface. [A1632]

"Apparatus and method of determining location of an object"

An apparatus and method of determining location of an object hidden from view. The apparatus includes an imaging tool for detecting hidden objects. The imaging tool includes a housing including a first end and a second end, a display supported by the first end of the housing, and a tracking device supported by the second end of the housing. The imaging tool also includes a transmitter supported by the housing and operable to transmit electromagnetic radiation toward a hidden target, an analysis module supported by the housing and operable to analyze feedback data related to the interaction between the target and the electromagnetic radiation, and an image module operable to receive data from the analysis module to generate an image on the display. [A1633]

"In-vehicle radar apparatus and method for manufacturing the same"

An in-vehicle radar apparatus includes a beam emitting part that emits a beam, a casing that supports the beam emitting part, and a reference unit that is attached to the casing and is equipped with multiple surfaces usable as a reference plane. A surface of the casing to which the reference unit is attached and the reference plane form an angle that depends on which one of the multiple surfaces is used as the reference plane. [A1634]

"System, method, and computer program product providing three-dimensional visualization of ground penetrating radar data"

A system for analyzing and displaying radar information comprises: a transmit and receive unit operable to transmit radar signals to a survey volume and to receive radar returned radar signals, a processing unit operable to: receive radar data from the returned radar signals, reduce the data into depth bins, each with a score based on received signal strength, create connections among depth bins based on respective scores, and to eliminate ones of the depth bins that do not meet a threshold number of connections, the system further comprising a display unit operable to create a display of at least a subset of the depth bins that are not eliminated by the processing unit. [A1635]

"Flow measurement in partially filled pipes using pulsed peak velocity doppler"

The present invention relates to a system and method for measurement of flow velocity using the transmission of a sequence of coherent pulsed ultrasonic signals into the flow, and sampling the received response signal at a predetermined delay time relative to the pulse transmission that does not correspond to the signal transmission time. The sampling may be coherent with a frequency offset from the coherency frequency of the pulses. The received signal samples are then spectrally processed, typically by a Fourier process, to generate a frequency domain data set. A threshold technique is used on the frequency domain data set to determine a peak Doppler shift. Average velocity is then obtained by multiplying the peak Doppler shift by a factor, for example, 0.90. In one embodiment, the transmit pulse and receive samples are interleaved by alternating between transmitting a pulse and, after a delay, sampling the received signal. [A1636]

"Apparatus and method for suppression of unnecessary signals in a radar system"

By pulsing transmission radio waves of continuous wave radar, clutter components included in a reception signal are suppressed. In a radar system that emits into space pulsed transmission radio waves being generated based on a frequency-modulated reference continuous waveform, acquires a reception signal by receiving the pulsed transmission radio waves reflected from an external object, and computes distance thereto and velocity thereof from the frequency of a beat signal obtained by mixing the acquired reception signal with the reference continuous waveform, the radar system includes a frequency-band selector 19 for classifying, on the basis of a spectral spread corresponding to the pulse width of the pulsed transmission radio waves, frequency components of the beat signal, and a distance/velocity calculator 20 for computing, on the basis of the classified results from the frequency-band selector 19, relative distance to and velocity of a moving object, or relative distance to a stationary object. [A1637]

"Vehicle control system"

In a vehicle control system, when an inter-vehicular distance between a subject vehicle and a preceding vehicle detected by a radar device is less than or equal to a predetermined value, automatic braking is performed or an alarm is activated to alert a driver to prevent a collision. A stationary object detection threshold value of a reception level of a reflected wave for detecting a stationary object is set higher in a predetermined region compared to a moving object detection threshold value of a reception level of a reflected wave emitted from the radar device for detecting a moving object such as a preceding vehicle. Thus, the system prevents a gate or an article in the roadway, which are not obstacles, from being erroneously recognized as obstacles. As such, unnecessary automatic braking and alarm activation for the gate and the article in the roadway can be prevented. [A1638]

"Real-time autonomous beam steering array for satellite communications"

A phased array satellite communication (SATCOM) system for ground stations receives information signals and a beam from a satellite and autonomously steers communication signals by phase information toward a satellite extracted from the received satellite beam. The new phased array eliminates the need for phase shifters to control a beam. The new phased array satellite communications system avoids delay in digital signal processing or feedback systems to find satellite locations, enabling autonomous real-time electronic beam steering with no delay. The new system is also used to handle signals from and to multiple satellites simultaneously. The new system is useful in other applications where an enhanced point-to-point communication link is required. [A1639]

"Target detecting apparatus using electronically agile radar"

A target detecting apparatus mounted on a vehicle has an electronically agile radar detecting a beat signal indicating a difference in frequency between transmission and reception signals and producing a time series of N reception data from the beat signal, a determining unit determining search areas placed at different ranges of distance from the vehicle while considering a running state of the vehicle and determining a data length for each search area, an extracting unit extracting (N-M+1) time series of short time data, respectively, having the data length corresponding to M reception data from the N reception data for each search area, a producing unit producing phase information from the short time data for each search area, and a detecting unit determining a target distance and a target bearing from the phase information and detecting a target from the target distance and the target bearing. [A1640]

"Radar system for motor vehicles"

A radar system for motor vehicles, having a least one radar sensor having a range of less than 50 m for monitoring traffic in an adjacent lane, wherein the radar sensor has a phase-controlled antenna and a control device for setting a plurality of radar lobes having different geometries. [A1641]

"Radar mining guidance control system"

A coal-mining machine uses a ground-penetrating radar based on a software-definable transmitter for launching pairs of widely separated and coherent continuous waves. Each pair is separated by a constant or variable different amount double-sideband suppressed carrier modulation such as 10 MHz, 20 MHz, and 30 MHz. Processing suppresses the larger first interface reflection and emphasizes the smaller second, third, etc. reflections. Processing determines the electrical parameter of the natural medium adjacent to the antenna. Deep reflections at 90-degrees and 270-degrees create maximum reflection and will be illuminated with modulation signal peaks. Quadrature detection, mixing, and down-conversion result in 0-degree and 180-degree reflections effectively dropping out in demodulation. [A1642]

"Double-sideband suppressed-carrier radar to null near-field reflections from a first interface between media layers"

A ground-penetrating radar comprises a software-definable transmitter for launching pairs of widely separated and coherent continuous waves. Each pair is separated by a constant or variable different amount double-sideband suppressed carrier modulation such as 10 MHz, 20 MHz, and 30 MHz Processing suppresses the larger first interface reflection and emphasizes the smaller second, third, etc. reflections. Processing determines the electrical parameter of the natural medium adjacent to the antenna. The modulation process may be the variable or constant frequency difference between pairs of frequencies. If a variable frequency is used in modulation, pairs of tunable resonant microstrip patch antennas (resonant microstrip patch antenna) can be used in the antenna design. If a constant frequency difference is used in the software-defined transceiver, a wide-bandwidth antenna design is used featuring a swept or stepped-frequency continuous-wave (SFCW) radar design. The received modulation signal has a phase range that starts at 0-degrees at the transmitter antenna, which is near the first interface surface. After coherent demodulation, the first reflection is suppressed. The pair of antennas may increase suppression. Then the modulation signal phase is changed by 90-degrees and the first interface signal is measured to determine the in situ electrical parameters of the natural medium. Deep reflections at 90-degrees and 270-degrees create maximum reflection and will be illuminated with modulation signal peaks. Quadrature detection, mixing, and down-conversion result in 0-degree and 180-degree reflections effectively dropping out in demodulation. [A1643]

"Satellite communications systems, components and methods for operating shared satellite gateways"

A shared satellite gateway can be configured to process at least first and second communications signals associated with respective at least first and second space-based components. The at least first and second communications signals are provided to/from the shared satellite gateway by respective at least first and second service links and respective at least first and second feeder links of the respective at least first and second space-based components. [A1644]

"RCS signature generation for closely spaced multiple objects using N-point models"

A method and system for analyzing the RCS of an object using N Point signature prediction models is provided. N-point signature prediction models are created for each object in a scenario and stored in lookup tables. Shooting and Bounce trace back techniques are used to determine RCS signatures of multiple objects in modeled scenarios to account for blockage by and coupling phenomena of a scattered field. [A1645]

"Method and system for determining velocity by using variable or distinct sampling rates"

A data processor applies transform processing to a first group of samples at a primary sampling rate, where the first group of samples is within a data window associated with at least one of the data blocks. A detector detects an estimated frequency shift between the transmitted signal and the reflected signal based on a primary peak frequency determined by the transform processing at the primary sampling rate. The data processor applies transform processing to a second group of samples at a secondary sampling rate, where the data window contains previously read samples and at least one new sample, if the estimated frequency shift falls within a target response frequency band. The detector detects an observed frequency shift between the transmitted signal and the reflected signal based on a secondary peak frequency determined by the transform processing at the secondary sampling rate. A velocity estimator for estimating a velocity of at least one of the object and the transmitter based on the estimated frequency shift, the observed frequency shift, or both. [A1646]

"Target object detection system"

A time needed until measurement values are obtained in a two-frequency continuous wave radar systems is reduced. An object detection system that emits transmission signals, as transmission waves, whose frequencies have been modulated successively into a plurality of stepped frequencies, and receives echoes of the transmission waves reflected from target objects, thereby calculating relative velocities of the target objects by frequency-analyzing reception signals obtained from the received echoes. The target object detection system includes: a frequency modulation component that repeatedly executes frequency-modulation processes to successively modulate the transmission signals into those of the stepped frequencies, within a minimum measurement time in which a desired velocity resolution is achieved, and a frequency-analysis component that frequency-analyzes throughout the repeated frequency-modulation processes the reception signals processed by the frequency-modulation component. [A1647]

"Ground clutter mitigation using a parametric time domain method"

Methods and systems are disclosed for investigating a region of interest with a radar. A radar signal is propagated to the region of interest. Sampled time-domain radar data scattered within the region of interest are collected. A likelihood function is calculated with the sampled time-domain data within a parametric model of the region of interest for a defined set of parameters. The set of parameters in varied to find an extremum of the likelihood function. [A1648]

"System and method for localizing sports equipment"

When playing a sport it is generally difficult to localize (exactly) an accessory requirement for that sport at a determined point in time. The localizing of sports equipment may however be desired in particular situations, for instance to track down lost articles of sports equipment, or to be able to apply the rules of a sport in efficient manner. The invention therefore relates to a system for localizing sports equipment. The invention also relates to a method for localizing sports equipment using such a system. [A1649]

"Localization system and method for localizing objects or animals using such a localization system"

In particular situations it may be desirable to follow, trace or otherwise localize specific (groups of) objects or animals, in particular people. The invention relates to a localization system. The invention also relates to a method for localizing objects or animals using such a localization system. [A1650]

"Method and apparatus for three dimensional tomographic image reconstruction of objects"

In accordance with an embodiment, a system includes a plurality of vehicles and a central node. The plurality of vehicles each have radar systems used to collect radar data about the target object. Each in the plurality of vehicles moves in a path to collect a portion of the radar data using a sampling map to coordinate collection of the radar data by the plurality of vehicles and communicates with every other vehicle to identify uncollected portions of the radar data. The central node is in communication with the plurality of vehicles, wherein the central node receives the radar data from the plurality of vehicles and creates a three dimensional image from the radar data received from the plurality of vehicles using a tomographic reconstruction process. [A1651]

"Method and apparatus for estimating terrain elevation using a null response"

A weather radar system coupled to a weather radar antenna, including a receive circuit for receiving radar returns received by the antenna and a processor for summing portions of the radar return data to obtain a null response. The null response is utilized to determine presence of terrain. [A1652]

"Impedance matched guided wave radar level gauge system"

A radar level gauge system, for determining a filling level of a product contained in a tank, the radar level gauge system comprising: a transceiver for generating, transmitting and receiving electromagnetic signals, a probe electrically connected to the transceiver at a probe-transceiver connection and arranged to extend towards and into the product contained in the tank, for guiding a transmitted signal from the transceiver towards a surface of the product, and for returning a surface echo signal resulting from reflection of the transmitted signal at the surface back towards the transceiver, an impedance matching device arranged to extend along a portion of the probe inside the tank, an extension of the impedance matching device, in a direction perpendicular to the probe, decreasing along the portion of the probe with increasing distance from the probe-transceiver connection, to thereby provide impedance matching between an impedance of the probe-transceiver connection and an impedance of the probe, and processing circuitry connected to the transceiver for determining the filling level based on the surface echo signal. [A1653]

"Pulse signal transmitting apparatus, method of adjusting waveform of the same, and DME ground station apparatus"

A transmitting apparatus comprises a generator for generating a pulse signal having a waveform approximated to the Gaussian error function at a prescribed timing, a transmitter for power-amplifying a pulse signal generated by the generator, and transmitting the amplified pulse signal, an evaluator for extracting a pulse waveform part from the power-amplified pulse signal, comparing the extracted pulse waveform part with an ideal waveform so as to obtain an error amount between the pulse waveform part and the ideal waveform, and evaluating whether or not the error amount is within a prescribed error range, and a controller for causing the generator to subject the waveform of the pulse signal to correction in such a manner that the error amount becomes smaller each time an evaluation result of the evaluator is that the error amount is out of the prescribed error range. [A1654]

"Method for detecting and documenting traffic violations at a traffic light"

A method for detecting and documenting red-light violations and/or speeding violations in which a radar beam is directed across all lanes of a roadway of interest and in which the speed and the position of a vehicle which passes through the radar beam are determined from the radar signals so as to be able to predict the probability of a red-light violation from the speed and the determined distance of the measured vehicle from a stop line and to trigger the recording of images of the violating vehicle at predetermined distances from the stop line. [A1655]

"Terrain awareness system with false alert suppression"

A terrain awareness and warning system includes electronics for receiving radar returns and providing terrain and/or obstacle alerts or warnings in response to the radar returns. The electronics receives information from a database and the information is utilized to suppress false alerts or warnings. [A1656]

"Active imaging using satellite communication system"

An active imaging system uses communication satellites to identify the location and physical attributes of a target. A transmitter emits a time-synchronized signal directed to a target. The transmitter radiates L-band RF signals. The transmitter can be positioned on an airborne or ground platform. A constellation of communication satellites receives and time stamps the time-synchronized signal reflected from the target to form an active image of the target. The constellation of communication satellites have multiple roles other than active imaging, such as providing voice and data communications. The time-synchronized signal reflected from the target can be received by multiple satellites within the constellation of communication satellites or by multiple antenna disposed on one satellite within the constellation of communication satellites. [A1657]

"Entropy method for range alignment for integration of target returns"

The proper timing or alignment for coherent or noncoherent integration of radar pulses returned from a potentially moving target is determined by determining the entropy associated with sets of range samples based on a plurality of different velocity hypotheses. That set associated with the minimum entropy is deemed to be the correct velocity hypothesis, and integration is then performed using the velocity hypothesis so determined. [A1658]

"Road map management system"

A road map management system is provided as follows: drawing a past-direction distribution map (Image A) and a future-direction distribution map (Image B) using multiple vehicles' traveling position data collected via a wide area network during a past-direction data collection period and a future-direction data collection period, respectively, comparing the two distribution maps to extract a differential distribution, defining under a predetermined condition as a recently opened or closed road the differential distribution, which is absent from Image A and present in Image B, or present in Image A and absent from Image B, respectively, and reflecting the defined results on the existing road map data to update. [A1659]

"Unified navigation and inertial target tracking estimation system"

A target tracking method uses sensor (s) producing target signals subject to positional and/or angular bias, which are updated with sensor bias estimates to produce updated target-representative signals. Time propagation produces time-updated target states and sensor positional and angular biases. The Jacobian of the state dynamics of a target model produces the state transition matrix for extended Kalman filtering. Target state vector and bias covariances of the sensor are time propagated. The Kalman measurement residual is computed to produce state corrections, which are added to the time updated filter states to thereby produce (i) target state updates and (ii) sensor positional and angular bias updates. The covariance of a state vector comprising target states and sensor positional and angular biases is propagated, producing measurement updated state covariance including (i) target position and velocity measurement covariance updates and (ii) the sensor positional and angular bias measurement covariance updates. [A1660]

"Road curvature estimation system"

A processor operatively coupled to a speed sensor adapted to generate a measure of a longitudinal speed of a vehicle on a roadway, and to a source of a measure of yaw rate of the vehicle, provides for selecting a most likely roadway model of a plurality of different roadway models and for outputting a corresponding associated at least one curvature parameter as an estimate of curvature of the roadway, wherein the processor incorporates a plurality of curvature estimators associated with the corresponding plurality of different roadway models. [A1661]

"Electromagnetic wave absorbing plate"

An electromagnetic wave absorbing plate composed of a transparent plate-like dielectric, wherein a thickness of the dielectric is determined such that an electromagnetic wave absorption quantity determined by using an incident side impedance Zxi at a time at which the electromagnetic wave becomes incident on a surface of the dielectric is equal to or higher than 10 dB. [A1662]

"Distance measuring device an method for testing the operation of a distance measuring system"

A distance measuring device for measuring a distance of a vehicle to an obstacle and a method for testing the operation of a distance measuring system. Two measuring systems are provided, each operating according to a different measuring method. Reliable operation of the second measuring system is established when the second measuring system detects an obstacle which has already been detected by the first measuring system. [A1663]

"Null steering system and method for terrain estimation"

A weather radar system coupled to a weather radar antenna, including a receive circuit for receiving radar returns received by the antenna and a processor for summing portions of the radar return data to obtain a null response. The processor adjusts the phase or power of at least one portion of the radar return data using a steering vector or a tuning vector. [A1664]

"Device for monitoring the surroundings of a vehicle"

A device is provided in a vehicle for monitoring the environment around the vehicle. The device includes a sensor system such that objects in a detection range of the sensor system are selected as a function of predetermined parameters so that only the selected objects are tracked by the sensor system. This permits adaptive use of reversible restraint means based on the sensor system output. [A1665]

"Crash-safe vehicle control system"

A crash-safe vehicle control system for controlling operating devices of an own vehicle such as a vehicle decelerating device and an occupant protecting device, on the basis of information on at least one preceding object existing in front of the own vehicle. The vehicle control system is arranged to effect at least one of a non-first-preceding-object-information-dependent control and a width-related-information-dependent control. The non-first-preceding-object-information-dependent control is a control of the operating devices on the basis of non-first-preceding-object information detected by the present system per se, in the presence of a high possibility of crashing of the own vehicle with a first preceding vehicle existing immediately in front of the own vehicle. The non-first-preceding-object information relates to at least one non-first preceding object each existing in front of the first preceding vehicle. The width-related-information-dependent control is a control of the operating devices on the basis of at least one of width-related information relating to a width and a widthwise position of each specific object selected from the above-indicated at least one preceding object. [A1666]

"RF system for tracking objects"

A system for tracking an object in space for position, comprises a transponder device connectable to the object. The transponder device has one or several transponder aerial (s) and a transponder circuit connected to the transponder aerial for receiving an RF signal through the transponder aerial. The transponder device adds a known delay to the RF signal thereby producing an RF response for transmitting through the transponder aerial. A transmitter is connected to a first aerial for transmitting the RF signal through a first aerial. A receiver is connected to the first, a second and third aerials for receiving the RF response of the transponder device therethrough. A position calculator is associated to the transmitter and the receiver for calculating a position of the object as a function of the known delay and the time period between the emission of the RF signal and the reception of the RF response from the first, second and third aerials. A method is also provided. [A1667]

"Positioning correction system and method for single and multi-channel ground penetrating radar"

A mobile geophysical instrument produces geophysical data sets each associated with a position computed by use of a position sensor. A variable time delay results between a time when data for each geophysical data set is collected and a time when a position associated with each geophysical data set is recorded. A module receives distance transducer data and includes circuitry configured to generate a module signal based on trigger signals from the distance transducer and a calibration value. A data acquisition system (DAS) receives geophysical data sets from the geophysical instrument, positioning data from the positioning sensor, and the module signals. The DAS generates a DAS timestamp in response to each module signal and associates the DAS timestamp with each geophysical data set and a position associated with the geophysical data set, so as to substantially eliminate the variable time delay. [A1668]

"Reverse radar with vehicle approaching alarm"

The present invention relates to a reverse radar with vehicle approaching alarm comprising a main body and sensors, in which the main body comprises a CPU circuit, an operational amplifier circuit, a switching circuit, a signal transmitting-receiving circuit, a detecting circuit and a power source, and the input terminals of the CPU circuit are connected to the output terminals of the operational amplifier circuit, the detecting circuit and the power source, and the output terminal of the CPU circuit is connected to the input terminal of the switching circuit, and the input terminal of the operational amplifier circuit is connected to the output terminal of the switching circuit, and the switching circuit and the signal transmitting-receiving circuit are interconnected, and the output terminals of the power source are connected to the input terminals of the switching circuit and the signal transmitting-receiving circuit, and the main body further comprises an alarming source which gives a warning signal when another vehicle approaches and a controlling circuit which controls the alarming source, and the controlling circuit is connected to the output terminal of the CPU circuit and the power source. The structure of the present invention is simple. When the vehicle is parked in a car park and the driver is not present, the present invention can give a warning signal to alert the approaching vehicle so as to prevent accident. [A1669]

"Method for compensating for the positional errors of a sensor"

A method for determining or compensating for the positional errors of a sensor tracking a target comprises the steps of operating the sensor to generate sensed information relating to the target and adding any sensor positional bias update information to produce updated sensed information. The target state is propagated to produce time updated state estimates. The Jacobian of the state dynamics and the state transition matrix for the extended Kalman filter algorithm are computed. The covariance of a state vector is time propagated using the state transition matrix. [A1670]

"In-vehicle radar device"

An in-vehicle radar device has a transmission section for emitting an electromagnetic wave, a scanning section for horizontally scanning the electromagnetic wave emitted by the transmission section, and a reception section for receiving a reflected wave reflected by a target with respect to the electromagnetic wave emitted by the transmission section. The in-vehicle radar device detects, based on an elapsed time from when the transmission section emitted the electromagnetic wave until the reception section receives the reflected wave and the scanning direction of the electromagnetic wave by the scanning section, at least a position and a horizontal width of the target reflecting the electromagnetic wave. The in-vehicle radar device further has a storage section for storing intensity of a previous time or a few tines before of the reflected wave received by the reception section, a comparing section for comparing the intensity of the reflected wave of the previous time or the few times before stored in the storage section and intensity for this time, and a first judgment section for judging that the target detected this tine differs from a target continuously detected the from the previous time or the few times before when the intensity of the reflected wave for this tine suddenly decreased compared to the intensity of the previous time or the few tines before, and the horizontal width of the target becomes greater than a horizontal width of a general vehicle. [A1671]

"On-vehicle radar device and on-vehicle radar device control system"

Provide an on-vehicle radar device that performs transmission control of a monitoring signal, following fixed rules, so that interference with other radar devices can be avoided with certainty. An on-vehicle radar device comprises a transceiver which transmits/receives a monitoring signal at a specified frequency band and transmits a priority order signal at a frequency within the above-mentioned frequency band, and a controller which switches the signals transmitted by the transceiver. The transceiver receives a priority order signal of another radar device, and when interference with the signal of the other radar device is detected, the controller, based on the priority order of that other device and on the priority order of the device itself, shifts, by a specified frequency amount, the frequency band of the monitoring signal transmitted by the transceiver. [A1672]

"Method for extension of unambiguous range and velocity of a weather radar"

A method for extension of unambiguous range and velocity of a weather radar. To avoid pulse overlaying, the pulse repetition time of a single pulse can be extended such that any return echo will arrive at the radar before the next pulse is transmitted. When pulse repetition time is increased, the maximum unambiguous range increases while the maximum unambiguous velocity decreases. The pulse overlaying can be avoided if consecutive pulses are sent on different frequencies that are far enough from each other to allow separation of pulses arriving simultaneously at the radar. When different frequencies are used an unknown phase difference is generated by distributed atmospheric targets to the return signals. This normally prevents use of the shorter pulse repetition time for velocity calculation. [A1673]

"Vehicle radar sensor assembly"

A radar electronics module includes a support structure having a first surface having a plurality of recesses with a transmitter circuit board and a receiver circuit board disposed thereon. The transmitter and receiver circuit boards are disposed over the first surface of the supports structure such that transmitter and receive circuits are disposed in cavities on the support structure. The radar electronics module further includes a digital/power supply circuit printed wiring board (PWB) disposed on a second surface of the support structure and a connector disposed on the support structure. The connector is disposed in such a way that it provides electrical connections for at least one of power signals, analog signals or digital signals between at least two of the digital/power supply PWB, the transmitter circuit board and the receiver circuit board. [A1674]

"Systems and methods of tracking and/or avoiding harm to certain devices or humans"

The present invention relates to systems and methods of tracking and/or avoiding harm to certain devices or humans. According to one exemplary embodiment, a method of tracking individual assets may include obtaining position data of an asset via a GPS receiver in communication with a position sensor associated with the asset, processing position data and sensor data via a processing component associated with the position sensor that receives the position data from the GPS receiver, and communicating sensor data to a host device via a communication interface associated with the position sensor and configured to enable wireless communication between the position sensor and the host device. [A1675]

"Direction finding and mapping in multipath environments"

Determining the direction of a direct arrival path between a receiver and a transmitter in a multipath environment by determining a transmitter heading relative to the receiver as proportional to a frequency offset of the direct path signal component relative to a multipath pedestal, an absolute velocity of the transmitter as proportional to a width of the multipath pedestal, a relative velocity between the transmitter and the receiver as proportional to a magnitude and a direction of doppler shift of the direct arrival component of the received signal relative to the doppler pedestal, and an amplitude of the multipath pedestal as proportional to a number and magnitude of scatterers in the multipath environment. The method is applied for continuous wave and modulated signals, for stationary and moving transmitters and for tracking and mapping transmitter paths. [A1676]

"Method and measuring device for determining a relative velocity"

The present invention relates to a method and device for determining a relative velocity between a host (100) and a target (102) . The present invention relates in particular to a method of the type that can be used in motor vehicle radar systems and specifically in radar systems of the type that detect obstacles in a blind spot of a motor vehicle. In the method according to the invention the following steps are carried out: substantially simultaneously determining a value for a radial velocity and a bearing with regard to a predefined spatial direction for a large number of measurement points (106) on the target (102) , calculating a large number of quotients from the radial velocity and the cosine of the associated bearing, a quotient being calculated for each of the measurement points (106) , determining an estimated relative velocity between the host (100) and the target (102) by forming an average of the large number of quotients. [A1677]

"Method for using logging device with down-hole transceiver for operation in extreme temperatures"

A logging radar system and method for measuring propped fractures and down-hole formation conditions in a subterranean formation including: a radar source, an optical source, an optical modulator for modulating an optical signal from the optical source according to a signal from the radar source, a photodiode for converting the modulated optical signal output from the optical modulator to the source radar signal, a transmitter and receiver unit, and a mixer. The transmitter and receiver unit receives the source radar signal from the photodiode, transmits the source radar signal into the formation and receives a reflected radar signal. The mixer mixes the reflected radar signal with the source radar signal to provide an output. This technology can be used to describe all fractures connected to the wellbore and differentiate between the dimensions of the two vertical wings of a propped fracture. [A1678]

"System and method for dual polarization radar with automatic built-in test equipment and calibration"

A method of calibrating a dual polarization weather radar system has been developed. The method first generates a transmission pulse from the radar system. The transmission pulse is then modified to generate a test signal that simulates a desired atmospheric condition. The test signal is transmitted directly into the radar system from a test antenna and the radar system is calibrated according to the test signal. [A1679]

"System and method for intrusion detection using a time domain radar array"

A system and method for highly selective intrusion detection using a sparse array of ultra wideband (UWB) radars. Two or more UWB radars are arranged in a sparse array around an area to be protected. Each UWB radar transmits ultra wideband pulses that illuminate the area to be protected. Signal return data is processed to determine, among other things, whether an alarm condition has been triggered. High resolution radar images are formed that give an accurate picture of the area to be protected. This image is used to detect motion in a highly selective manner and to track moving objects within the protected area. Motion can be distinguished based on criteria appropriate to the environment in which the intrusion detection system operates. [A1680]

"System and method for processing data in weather radar"

Systems and methods that adapt to the weather and clutter in a weather radar signal and apply a frequency domain approach that uses a Gaussian clutter model to remove ground clutter over a variable number of spectral components that is dependent on the assumed clutter width, signal power, Nyquist interval and number of samples. A Gaussian weather model is used to iteratively interpolate over the components that have been removed, if any, thus restoring any overlapped weather spectrum with minimal bias caused by the clutter filter. The system uses a DFT approach. In one embodiment, the process is first performed with a Hamming window and then, based on the outcome, the Hamming results are kept or a portion of the process is repeated with a different window. Thus, proper windows are utilized to minimize the negative impact of more aggressive windows. [A1681]

"Efficient methods for wideband circular and linear array processing"

The objective of this patent is to develop new signal processing algorithms for a wide-band circular electronically scanned array (CESA) or a wideband linear electronically scanned array (LESA) for use in surveillance and communications applications, where a sequence of pulses are transmitted and their returns are collected by the array for further processing. Instead of partitioning the entire wideband frequency into various subbands and then processing them separately using narrowband schemes, a frequency focusing method is proposed here to compensate and focus the wideband spatio-temporal data into a single narrow frequency band. This is made possible by operating with a pre-computed frequency focusing matrix that transforms the data from various frequency slots that are spread across the entire wideband region into a common narrowband frequency for the array outputs. Finally the focused narrowband data can be processed using conventional space-time adaptive processing methods to suppress the clutter/noise returns and detect any targets present. [A1682]

"Radar level gauge system using a waveguiding structure with periodically arranged reference impedance transitions"

A radar level gauge system, for determining a filling level of a product contained in a tank, said radar level gauge system comprising: a transceiver for generating, transmitting and receiving electromagnetic signals within a frequency range, a waveguiding structure arranged to extend into said product contained in the tank and to guide a transmitted signal from said transceiver towards a surface of said product and to guide echo signals resulting from reflections at impedance transitions encountered by the transmitted electromagnetic signals, including a surface echo signal resulting from reflection at said surface, back to said transceiver, a plurality of reference impedance transitions provided substantially periodically along said waveguiding structure with a distance between adjacent reference impedance transitions that is selected such that signals resulting from reflection of said transmitted signal at each of said reference impedance transitions combine to form a reference signal having a frequency within said frequency range, and processing circuitry connected to said transceiver for determining a propagation velocity of said electromagnetic signals in a medium inside the tank above said surface of the product based on said frequency of said reference signal and said distance between adjacent reference impedance transitions, and determining said filling level based on said surface echo signal and said propagation velocity. [A1683]

"Dual port memory trigger system for a ground penetrating radar"

Systems and methods for generating trigger signals in a ground penetrating radar. In one embodiment, sequence data is generated based on a desired triggering sequence for an array of antennas. The sequence may be generated based on position data from position devices and operational modes. According to one embodiment, as the sequence data is generated it is transferred to, and stored on, a dual port memory device through a first side of the dual port memory device. The sequence data can then be accessed independently through a second side of the dual port memory device. This data may be used by a logical network to produce antenna trigger signals as a logical combination of timing input signals and the sequence data. [A1684]

"Method for using pulse compression in weather radar"

A system and method for processing data related to weather phenomena in a meteorological radar system. The method includes receiving an echo signal generated by transmitting a long pulse and employing a mismatched windowed filter on the echo signal such that the echo signal is compressed in time to achieve fine range resolution without substantially degrading sensitivity and while achieving low range time side lobes for Doppler velocities expected to be measured by the meteorological radar system. [A1685]

"System and method for position or range estimation, tracking and selective interrogation and communication"

An antenna mountable on a weapons platform, a communication system and methods of estimating position or range and conducting directional communication. In one embodiment, the antenna includes: (1) a Luneberg lens portion having a substantially planar surface and a convex surface, (2) a radio frequency (RF) reflective layer located proximate the substantially planar surface and (3) a feed horn array located proximate the convex surface and configured to receive RF signals through the Luneberg lens portion and reflected off the RF reflective layer.

[A1686]

"Signal processing method for FM-CW radar"

Disclosed is a signal processing method for an FM-CW radar that can accurately detect the relative distance, relative velocity, etc. with respect to a target approaching or receding at a high relative velocity, wherein predicted values for peak frequencies currently detected in upsweep and downsweep sections are computed from the previously detected relative distance and relative velocity, and it is determined whether any of the predicted values exceeds a detection frequency range and, if there is a peak frequency that exceeds the detection frequency range, the frequency is folded and the folded frequency is taken as one of the predicted values, the method then proceeding to search the currently detected peak frequencies to determine whether there are upsweep and downsweep peak frequencies approximately equal to the predicted values and, if such upsweep and downsweep peak frequency are found, the peak frequency approximately equal to the folded predicted value is folded and the folded peak frequency is used. [A1687]

"Radar based ground vehicle collision prevention"

The present invention comprises systems and methods for preventing collisions between aircraft and ground vehicles. In one embodiment, a system includes a proximity detection unit and a transducer proximate to a selected structural portion of an aircraft, the proximity detection unit being operable to emit ranging signals through the transducer and to receive reflected signals through the transducer to determine the position of an object within a ranging area adjacent to the structural portion. The system further includes an alarm device coupled to the proximity detection unit that is responsive to a signal generated by the proximity detection unit. In another embodiment, a method includes determining a distance between the ground service vehicle and a selected structural portion of the aircraft when the vehicle is positioned in a ranging area about the aircraft. The method further includes generating a proximity alarm based upon the distance. [A1688]

"Radar based runway confirmation database acquisition system"

A method of identifying a runway is disclosed. A first scan of an area of ground known to include a runway is performed. The first scan is accomplished using a weather radar system at a predetermined position. A first image is obtained from the first scan. The first image is stored in a memory. A second scan of an area of ground proposed to include the runway is performed. The second scan is accomplished using a weather radar system at what is believed to be the predetermined position. A second image is obtained from the second scan. The first image is retrieved from the memory. It is determined whether features in the first image correlate to features in the second image. A runway confirmation signal is sent to a pilot of the aircraft when there is a substantial certainty of correlation between the first and second images. [A1689]

"Radar detector with position and velocity sensitive functions"

A GPS enabled radar detector dynamically handles radar sources based upon previously stored geographically referenced information on such sources and data from the GPS receiver. The detector includes technology for determining the location of the detector, and comparing this location to the locations of known stationary sources, to improve the handling of such detections. The detector may ignore detections received in an area known to contain a stationary source, or may only ignore specific frequencies or may handle frequencies differently based upon historic trends of spurious police radar signals at each frequency. Notification of the driver will take on a variety of forms depending on the stored information, current operating modes, and vehicle speed. [A1690]

"Virtual-antenna receiver"

A receiver for reception of radio signals while the receiver is moving at a high speed using two or more antennas closely spaced and arranged behind each other in the direction of motion for receiving the radio signals. A signal is obtained which represents a virtual antenna that is at least temporarily stationary with respect to the environment, despite the movement of the receiver. The receiving signal of the virtual antenna is obtained under the control of a feedback signal of the receiver. [A1691]

"Electromagnetic transponder with no autonomous power supply"

An electromagnetic transponder comprising: an oscillating circuit, a first rectifying bridge having its A.C. input terminals connected across the oscillating circuit and having its rectified output terminals connected at least to a voltage regulator in charge of providing a supply voltage, and a second rectifying bridge, of dimension smaller than that of the first bridge, having its two A.C. input terminals connected across the oscillating circuit and having at least one output terminal connected to a demodulator of data sensed by the oscillating circuit. [A1692]

"Radar device"

One of the objects of the present invention is to reduce the size of a radar device mounted on a vehicle body. To achieve the object, one aspect of the invention provides a radar device, which is mounted on a vehicle body and detects a target present in a moving direction of the vehicle body, with (1) a transmitting antenna for transmitting a mm-Wave that forms an electric field having a width equivalent to the width of the vehicle body at a position away in a moving direction of the vehicle body by a distance corresponding to the most-approached distance defined between the vehicle body and the target and (2) two receiving antennas for receiving the reflected mm-Waves at mutually different positions. [A1693]

"High-capacity location and identification system for cooperating mobiles with frequency agile and time division transponder device on board"

Cooperating mobiles (ground vehicles, aircraft) are located and identified by Multilateration and Automatic Dependent Surveillance-Broadcast (ADS-B) techniques using the frequency band and the format of the Secondary Surveillance Radar (SSR) signals in high traffic situations. Standard messages, transmitted by the mobile on the downlink channel, i.e. to a set of fixed receiving stations, and including the identification code, permit the location of the mobile by multiple time measurements (Multilateration) from a subset of the set of fixed receiving stations, when the message contains the position (GPS and, later, Galileo datum) the mobile may be located with the ADS-B when in view even of a few stations or of a single station. In order to overcome the problem that arises with high traffic, i.e. the superimposition of signals, called garbling. [A1694]

"Integrated circuit for measuring the distance and/or velocity of objects"

An integrated circuit for measuring the distance and/or velocity of objects, having: a high-frequency signal generating device for generating a first HF signal having a predefined frequency and a predefined modulation curve from at least one LF signal, a diplex/mixing device, which is coupled to the high-frequency signal generating device for determining a frequency offset between the first HF signal and a reflected second HF signal, a transceiver device, which is coupled to the diplex/mixing device, for sending the first HF signal and simultaneously receiving the reflected second HF signal, which is a function of a predefined modulation curve of the first HF signal and a distance to a reflecting object, and an adapter device, which is coupled between the diplex/mixing device and the transceiver device, for adapting the impedance of the transceiver device as a function of the frequency of the first HF signal. [A1695]

"Radar system"

Embodiments of the invention are concerned with a radar system, and relates specifically to scanning radar systems that are suitable for detecting and monitoring ground-based targets. In one aspect, the radar system is embodied as a scanning radar system comprising a frequency generator, a frequency scanning antenna, and a receiver arranged to process signals received from a target so as to identify a Doppler frequency associated with the target, wherein the frequency generator is arranged to generate a plurality of sets of signals, each set having a different characteristic frequency, the frequency generator comprising a digital synthesiser arranged to modulate a continuous wave signal of a given characteristic frequency by a sequence of modulation of patterns whereby to generate a said set of signals, and wherein the frequency scanning antenna is arranged to cooperate with the frequency generator so as to transceive radiation over a region having an angular extent dependent on the said generated frequencies. Embodiments of the invention thus combine digital synthesiser techniques, which are capable of precise frequency generation and control, with passive frequency scanning and Doppler processing techniques. This enables accurate control of range and of scan rates, and enables optimisation of range cell size for factors such as slow and fast target detection and Signal to Noise ratio, and thus enables detection of targets located at distances considerably farther away than is possible with known systems having similar power requirements. [A1696]

"Vehicle-installation direction detection apparatus enabling accurate detection of target body directions irrespective of vehicle speed"

A vehicle-installed direction detection apparatus is controlled in accordance with the vehicle speed, to detect respective directions of one or more target objects by selectively applying high-resolution detection processing or low-resolution detection processing to received signals obtained from the elements of an array antenna of a radar apparatus, with the selection being determined in accordance with whether the speed attains a predetermined threshold value. The high-resolution detection processing is based on correlation between the received signals, utilizing an null scan type of algorithm such as MUSIC, while the low-resolution detection processing is based for example on digital beam forming. [A1697]

"Systems and methods for displaying hazards"

A system, according to various aspects of the present invention, provides a presentation to a hazard display. The system includes a memory having surveillance data and a processor. The processor updates an image in accordance with the surveillance data to provide an updated image. The processor also prepares a presentation in accordance with the updated image. The processor further provides the presentation to a hazard display. At least one of updating, preparing, and providing utilize a first scan mode for a hazardous region of the presentation and a second scan mode for a nonhazardous region of the presentation. [A1698]

"Subaperture 3D imaging"

Embodiments of methods, apparatuses, and articles for receiving phase history data collected from synthetic aperture radar imaging of a terrain, dividing the received phase history data into a plurality of subsets corresponding to a plurality of subaperture intervals, computing for each of a plurality of points of the terrain, a contribution of each of the plurality of subaperture intervals, each contribution including a magnitude and a phase calculated by interpolating the subaperture interval, using the corresponding subset of phase history interval data, and based at least in part on an arbitrary reference surface's elevation at the point, summing for each of the plurality of points of the terrain, the contributions of the plurality of subaperture intervals, and forming an image of the terrain based at least in part on the summed contributions of the plurality of subaperture intervals to the plurality of points of the terrain, are described herein. [A1699]

"Automotive collision mitigation apparatus"

A collision mitigation controller drives a target brake to be controlled for assisting driver's collision-avoidance operation when a calculated collision time is less than an automatic brake a1 judgment line which is determined in advance. The controller drives the automatic brake a1 in order to mitigate damage generated by a collision with an obstacle or another vehicle when the collision time is less than an automatic brake a2 judgment line which is also less than the automatic brake a1 judgment line. The controller decreases the braking force for the automatic brake a2 when judged that the automatic brake a1 is not driven, as compared with the judgment where the automatic brake a1 is driven. When the automatic brake a2 drives the target brake, it is possible to avoid a collision where own vehicle is struck from behind by the rear vehicle which runs on a same traffic lane. [A1700]

"Shielded compartment for mounting a high frequency radar component on a printed circuit board"

The shielded mounting module comprises a cover member and a box member . The box member includes a plurality of bosses formed in the bottom surface. Each of the bosses provide an electrical contact point and are soldered to corresponding electrical pads on a circuit board, for example, grounded pads on the circuit board. The bosses also serve as stand-offs or spacers to mount the module above the surface of the circuit board. In another embodiment, the bosses are formed as a pair of rails. [A1701]

"System and method for dual polarization radar with automatic built-in test equipment and calibration"

A calibration system for the receiver of a dual polarization radar system has been developed. The system includes a radar transmitter that transmits signals in horizontal and vertical polarizations and a radar receiver that receives the horizontal and vertical polarization signals. The system also includes a test signal generator that generates a continuous wave test signal. A calibration circuit for the radar receiver modifies the test signal to simulate weather conditions by adjusting the attenuation and Doppler phase shift of a continuous wave test signal. [A1702]

"Object detection system"

An object detection system, in particular for a motor vehicle, has multiple object detectors and/or operating modes with which different detection ranges and/or detection zones are detected. In this case, an object detector is preferably a radar sensor which has a relatively large detection range with a relatively small angular detection zone in a first operating mode and has a detection range that is small relative to the first with an enlarged angular detection zone in a second operating mode. [A1703]

"Systems and methods for using a TCAS directional antenna for omnidirectional transmission"

A method of transmitting from a traffic alert and collision avoidance system (TCAS) directional antenna, the TCAS directional antenna including a plurality of antenna elements connected to an integrated beam forming network, according to various aspects of the present invention comprises: providing a signal to each input of the integrated beam forming network, wherein each signal is of equal phase and equal amplitude to result in transmitting omnidirectionally from the TCAS directional antenna. [A1704]

"System and method for management of a ground obstacle display"

Systems and methods for managing a visual display in a ground proximity warning system. In one embodiment, a system includes at least one aircraft sensor system operable to acquire aircraft data and a ground proximity warning computer coupled to the aircraft sensor system that is operable to process the aircraft data to generate ground proximity warning data corresponding to a sensed ground obstruction. An indicating system includes at least one visual display device that is operable to display terrain elevations and to display a visual symbol corresponding to at least one of the ground obstructions, wherein at least one of the computer and the visual display device is controllable to selectively alter an appearance of the visual symbol relative to the terrain elevations. [A1705]

"Phase shifted transmitted signals in a simultaneous dual polarization weather system"

A system for simultaneously propagating dual polarized signals in a polarimetric radar system includes a system for shifting the phase of one of the two signals. The simultaneous dual polarization weather radar transmits signals in both the horizontal and vertical orientations at the same time. Upon reception, the signals in each channel are isolated and a number of standard and polarimetric parameters characterizing atmospheric conditions are determined. The accuracy upon which these parameters can be determined depends partially upon the interference between these two channels. The system and method isolates the vertical and horizontal channels by using the phase information from the signals to minimize the interference. [A1706]

"Radar level gauge system and method providing a signal indicative of process reliability"

A method for determination of a filling level of a product contained in a tank, comprising the steps of generating and transmitting an electromagnetic signal, propagating the transmitted electromagnetic signal towards the product in the tank, receiving echo signals resulting from reflections at impedance transitions encountered by the transmitted electromagnetic signal, classifying one of the echo signals as a surface echo signal resulting from reflection at a surface of the product inside the tank, evaluating an additional echo signal, providing, if an amplitude of the additional echo signal is greater than a predetermined disturbance echo threshold, a signal indicative thereof, and determining the filling level based on the surface echo signal. [A1707]

"Obstacle sensor operating by collimation and focusing of the emitted wave"

An obstacle sensor operating by collimation and focusing of the emitted wave comprises: a device (I) for insulating the electromagnetic waves emitted by a generator (1) , a device for the automatic control (12, 12') of the transmitter and of the sensor status, a device (15'/15'") for amplifying the power of the signals emitted and/or received, different shapes of output lens (14'/14'") of the antenna, with or without peripheral lobes (16) , associated or non associated to microwave sensors (19) . The sensor is associable to passive and/or active obstacle warning reflectors with the possibility of discriminating them not only if front but also side and above and below the horizon central azimuth, for road, aircraft and naval applications. [A1708]

"Earth-penetrating radar with inherent near-field rejection"

A ground-penetrating radar comprises a transmitter for launching pairs of widely separated and coherent continuous waves. Each pair is separated by a different amount, such as 10 MHz, 20 MHz, and 30 MHz. These are equivalent to modulation that have a phase range that starts at 0-degrees at the transmitter antenna which is near the ground surface. Deep reflectors at 90-degrees and 270-degrees will be illuminated with modulation signal peaks. Quadrature detection, mixing, and down-conversion result in 0-degree and 180-degree reflections effectively dropping out in demodulation. [A1709]

"Method and distance detecting device for detecting the projected distance between a distance measuring device and an obstacle"

The invention relates to method and a device for determining the projected distance between a distance measuring device and a nearest point on the surface of an obstacle, the projected distance between said point and the distance measuring device being fundamentally the shortest in relation to all points of the obstacle. The aim of the invention is to be able to calculate the current distance between the nearest point and the distance measuring device, when the point P is no longer inside the detection region of the distance measuring device. According to the invention, the calculation of the projected distance is based on information about the relative movement of the distance measuring device and the obstacle, and on a defined limiting distance. [A1710]

"UWB signal transmitter for radars and sensors"

The present invention relates to a UWB radio transmission module including a UWB signal generation circuit. The UWB signal generation circuit controls the power consumption outputs according to a power supply opening/closing mode, and is connected to a common resonator and a feedback circuit type of UWB signal output device. [A1711]

"Off-axis angle estimation method and apparatus using the same"

Without using a traveling velocity of a vehicular object mounted with a radar device, an off-axis angle which is an offset angle between a reference direction of the radar device and a traveling direction of the vehicular object is estimated. An off-axis angle estimation method for estimating an off-axis angle (.phi.) of a radar device (1) mounted on the vehicular object having a predetermined traveling direction includes that, from among reflection points of which a relative-velocity component (q) along the line of radar sight and an azimuthal angle (.theta.) are detected by the radar device (1) , a plurality of reflection points of which the relative-velocity components in the traveling direction of the vehicular object being approximately equal to one another is selected without using the traveling velocity of the vehicular object, and based on the relative-velocity components along the line of radar sight, and on the azimuthal angles, of the plurality of reflection points having been selected, the off-axis angle (.phi.) is autonomously calculated solely from the observed values based on radar waves. [A1712]

"In-vehicle mount radar device"

In an in-vehicle mount radar device which has a reception antenna array containing plural reception antennas and two transmission antennas and in which a transmission pulse is time-divisionally and alternately transmitted from each of the two transmission antennas, a reception pulse based on the transmission pulse reflected from a target is received by each of the reception antennas, and at least angle information concerning the target is calculated by using reception data obtained by each reception antenna, the reception antenna array is constructed by arranging the plural reception antennas so that the reception antennas are spaced from one another at an interval d, each of the two transmission antennas is disposed so as to be spaced from the reception antenna located at each of both the end portions of the reception antenna array at an interval D, and the interval D is set to any value larger than the interval d. [A1713]

"Weather radar with spurious reflection lobe mitigation"

A weather radar system is capable of mitigating the effects of spurious reflections caused by a reflection lobe. Processing electronics can be used to sense weather and to identify spurious reflections caused by the reflection lobe. The reflection lobe can be caused by antennae or radome characteristics. The weather radar system can include a display that provides visual indicia of the weather with mitigation of the spurious reflections. [A1714]

"Radar level gauging system for use at sea"

A radar level gauging system for determining a filling level of a liquid in a tank arranged in a mobile unit is disclosed. The system is comprises a processing circuitry for determining a local and momentary filling level at different times at a certain position in the tank of the container based on received echo signals, and is further adapted to identify variations between said local and momentary filling levels corresponding to surface waves in the tank due to movement of said mobile unit. The result of this identification is used for improving the accuracy when estimating an average filling level of the tank. [A1715]

"System and method for detecting an intruder using impulse radio technology"

An intrusion detection system and method are provided that can utilize impulse radio technology to detect when an intruder has entered a protection zone. In addition, the intrusion detection system and method can utilize impulse radio technology to determine a location of the intruder within the protection zone and also track the movement of the intruder within the protection zone. Moreover, the intrusion detection system and method can utilize impulse radio technology to create a specially shaped protection a one before trying to detect when and where the intruder has penetrated and moved within the protection zone. [A1716]

"System and method for location determination using time differences"

The present invention relates to a system and a method for location determination using time differences. The method of the invention comprises the steps of: transmitting a transmission signal by using a directional transmitter rotating at an angular velocity, the transmission signal comprising a transmission identification and the transmitting time, receiving the transmission signal by using an omnidirectional transceiver, and adding a personal identification to the transmission signal to be a response signal, transmitting the response signal, receiving the response signal by using an omnidirectional receiver and recording the receiving time, and calculating the location of the omnidirectional transceiver corresponding to the directional transmitter according to the difference between the receiving time and the transmitting time. By utilizing the system and the method of the invention, the corresponding location of the omnidirectional transceiver can be calculated accurately without disposing a lot of sensors in the space, and the system of the invention need not be reconfigured for new environments. Therefore, the conventional problems of high installation cost and complicated settings can be improved. [A1717]

"Electromagnetic location and display system and method"

An unknown location for a transmitter/receiver is determined using a calibration process. An area is established with reference receivers at known locations and a mobile transmitter provides a location signal. An alternative embodiment uses reference transmitters and a mobile receiver. for calibration, the transmitter is placed at multiple measured locations and signal measurements are taken to generate a calibration map. Multiple signal measurements may be taken at each receiver, and multiple receivers may be used. In one embodiment, signal measurements include a near-field phase. In operation, one or more location signals are measured at one or more receivers. The measured signals are compared with the calibration maps to generate a set of comparison maps which are combined to generate a likelihood map. A likely region and most likely location are determined from the likelihood map and may be displayed relative to a map of the environment. [A1718]

"System and method to determine burst transmission timing for data communications using radar"

A method for transmitting bursts of data from a communications terminal to a mobile radar transceiver having inter-burst periods is disclosed. The method includes determining a propagation time between the communications terminal and mobile radar transceiver. A length of inter-burst periods of the mobile radar transceiver having an inter-burst timing can be determined. Bursts of data having a communication burst period that is less than the inter-burst period can be formed. The bursts of data from the communications terminal can be transmitted at a transmission time based on the inter-burst timing and the propagation time to enable each burst of data to be received by the mobile radar transceiver during one of the inter-burst periods. [A1719]

"System and method for detecting drifts in calibrated tracking systems"

A method and system for detecting drift in calibrated tracking systems used to locate features with respect to one or more coordinate systems allows medical devices to be accurately tracked within a reference coordinate system, and facilitates detection and compensation for changes in the orientation of the tracking system with respect to the coordinate system over time. [A1720]

"Vehicular lamp incorporating millimeter radar"

A vehicular lamp 1 including a lamp unit 13 provided inside a lamp chamber 7 so that the optical axis direction of lamp unit 13 is adjustable with the use of a tilting movement adjustment mechanism 15. The lamp chamber 7 is formed by a lamp body 3 and a transparent front cover 5 attached to the front opening of the lamp body 3, while the lamp unit 13 is formed by a reflector 9 and a light source 11. A millimeter wave radar device 25 is installed in the vehicular lamp, and it is composed of a controlling unit 25B and an antenna unit 25A that are provided separately from each other so that the controlling unit is attached to the lamp body and the antenna unit is attached to the lamp unit. [A1721]

"Velocity sensor and ground vehicle velocity sensor using the same"

There is provided a highly accurate velocity sensor having a reduced detection error. A sensor circuit unit generates an electromagnetic wave and emits it from a transmission antenna. Furthermore, a reception antenna receives a reflection wave from the ground and a mixer mixes it with a local signal, thereby generating a low-frequency signal. The electromagnetic wave emitted from the sensor circuit unit shapes a beam by a dielectric lens before emitting it toward the ground. Here, the beam shape is such that the beam width in the vicinity of the sensor is smaller than the beam width in the vicinity of the ground. [A1722]

"Proximity sensor"

A microwave oscillating portion 30 has an output oscillator function that is capable of adjusting automatically a frequency of microwaves radiated from an electrically conductive member made of an outer panel 11-14 as an antenna at a specific frequency of a sufficiently short wavelength in relation to a size of the electrically conductive member made of the outer panel 11-14. The microwave oscillating portion 30 can detect a human and an object of a detection object 27 in a detection area 11A-14A set at an outside of the outer panel 11-14 that is integrally or separably mounted on a vehicle 1. [A1723]

"Variable loop gain and resolution pulse system and method with point target editing capability"

A weather radar system is coupled to an antenna. The weather radar system includes a processor for controlling pulses provided to the antenna and for processing return pulses received by the antenna. The processor is configured to vary a range resolution and loop gain relationship based on a data calculation. The weather radar system includes a processor for generating pulses and for processing return pulses received by the antenna. The processor generates high resolution data from the return pulses. The processor uses the high resolution data to perform high resolution radar analysis including removal of point and/or point-like target returns and reassembles the high resolution data to perform high gain radar analysis at lower resolutions. [A1724]

"Signal processing methods for ground penetrating radar from elevated platforms"

Methods and systems for using ground penetrating radar (GPR) to obtain subsurface images. The depression angle, frequency, and polarization can all be adjusted for the soil conditions at hand. In particular, the depression angle is set at the "pseudo-Brewster angle" for improved ground penetration. [A1725]

"System and method for filling level determination"

A method for determining a filling level of a product contained in a tank, by means of a radar level gauge system comprising a transceiver for generating, transmitting and receiving electromagnetic signals, a probe connected to the transceiver and arranged to guide a transmitted electromagnetic signal from the transceiver towards and into the product inside the tank, and to return a reflected electromagnetic signal resulting from reflection of the transmitted electromagnetic signal by a surface of the product back towards the transceiver, and a plurality of reference reflectors each being arranged at a respective known position along the probe and being configured to reflect a portion of the transmitted electromagnetic signal back towards the transceiver. The method comprises the steps of identifying, based on received electromagnetic signals reflected by the reference reflectors, a set of reference reflectors located above the surface of the product, selecting first and second reference reflectors comprised in the set of reference reflectors, determining a propagation velocity compensation factor based on a known distance between the first and second reference reflectors and a distance therebetween determined using received electromagnetic signals reflected by the first and second reference reflector, respectively, and determining the filling level based on a received electromagnetic signal reflected by the surface of the product, and the propagation velocity compensation factor. [A1726]

"Driving assistance method for a vehicle"

A driving assistance method is provided for a vehicle in which the speed of the vehicle is controlled by means of a longitudinal guidance control system and the lateral guidance of the vehicle is controlled by means of a lateral guidance control system, and wherein lateral guidance control, which includes yaw-rate control and/or lateral acceleration limitation, has priority over speed control. To reduce the danger of an unstable handling condition of the vehicle, and to assist the vehicle operator in driving the vehicle, the longitudinal guidance control system is activated during lateral guidance control and, after lateral guidance control has ended, the longitudinal guidance control system is turned off or is shifted to an operating condition that accelerates the vehicle with longitudinal acceleration below a predetermined index longitudinal acceleration. [A1727]

"Integrated distance measuring equipment and transponder system and method"

A combined transponder and DME system for use in an aircraft. An L Band transmitter is shared between transponder and DME. [A1728]

"Vehicle detection apparatus and method"

A front-going vehicle is recognized by using a camera image from a camera for monitoring the front of one's own vehicle and detection data from a radar for detecting position of an object in front of one's own vehicle and distance to this object. A front-going vehicle is recognized among photographed objects with object images contained in the camera image by extracting images in a specified area inside the camera image centered around positions of objects in detection data from the radar, binarizing the extracted images, matching patterns between an image figure contained in the binarized image and reference images and judging an image figure as a figure of a front-going vehicle if it is concluded that this image figure matches one of the reference images over a specified percentage. The reference figures are of a specified pattern, having a horizontally elongated part with downward protrusions from both its end parts so as to resemble a back view of a vehicle. [A1729]

"Road curvature estimation system"

A processor using a first Kalman filter estimates a host vehicle state from speed and yaw rate, the latter of which may be from a yaw rate sensor if speed is greater than a threshold, and, if less, from a steer angle sensor and speed. Road curvature parameters are estimated from a curve fit of a host vehicle trajectory or from a second Kalman filter for which a state variable may be responsive to a plurality of host state variables. Kalman filters may incorporate adaptive sliding windows. Curvature of a most likely road type is estimated with an interacting multiple model (IMM) algorithm using models of different road types. A road curvature fusion subsystem provides for fusing road curvature estimates from a plurality of curvature estimators using either host vehicle state, a map database responsive to vehicle location, or measurements of a target vehicle with a radar system. [A1730]

"Driver assistance system"

Driver assistance system of a land or water vehicle that encompasses a long-range radar apparatus for the detection of distant objects and at least one short-range detection apparatus for the detection of objects in the vehicle's close proximity. The system further includes an operation control apparatus for control of operation at least of the long-range radar apparatus depending on a motion state of the land or water vehicle. The operation control apparatus is configured to deactivate the long-range radar apparatus at least at standstill of the land or water vehicle or switch it to an essentially powerless standby mode, while keeping the short-range detection apparatus activated. [A1731]

"Method for determining positions of targets by bistatic measurements using signals scattered by the targets"

A method for determining the positions of targets by bistatic measurements using signals scattered by the targets is provided in which the velocities of the targets can also be determined. The range of the transmitters is selected so that a target at an arbitrary point can be measured, by scattering in the target, by at least four cooperating measuring facilities. First the targets are associated by calculating, in two independent ways, two sets of sums of distances between transmission points and targets and, respectively, targets and reception points. Subsequently, the two sums are sorted with respect to distance, compared with each other, and the sums that correspond with each other within a predetermined margin of error are stated to correspond to conceivable targets. The association of targets is improved and completed by corresponding calculations being carried out for Doppler velocities. Finally, the positions of the targets are calculated from a system of equations for the bistatically measured distances. [A1732]

"Advanced electromagnetic location of electronic equipment"

An apparatus for measuring at least one of unintentional and intentional electromagnetic emissions for at least one of enabling electromagnetic location of predetermined electronic equipment giving off such at least one of such unintentional and intentional electromagnetic emissions, tagging such predetermined electronic equipment and tracking such predetermined electronic equipment and various combination thereof. The apparatus comprises an emitter mechanism for providing an amplified electromagnetic energy which at least one of amplifies and changes a frequency content of the at least one of such unintentional and intentional electromagnetic emissions signature of a targeted electronic device by using an applied electromagnetic field generated by the emitter mechanism. There is a receiver for receiving the at least one of such unintentional and intentional electromagnetic emissions signature of such targeted electronic device. [A1733]

"Systems and methods for mine detection"

Systems, methods, and devices for detecting land mines and unexploded ordnance are disclosed. A first embodiment may be construed as a method that includes: inserting an antenna into the ground, transmitting an electromagnetic signal into the ground via the antenna, receiving a response via the antenna, and processing the response to generate an image which can be examined to determine whether a mine exists within proximity of the antenna. [A1734]

"Distance measuring system"

Disclosed is a distance measuring system comprising a transmitter that sequentially generates pulse sequences each having a plurality of pulse signals of equal amplitudes arranged at equi-time intervals, and transmits the generated pulse sequence as a radio wave, and a receiver that receives the pulse sequence transmitted from the transmitter as a radio wave, and has a distance calculator that acquires propagation times of the pulse signals in the received pulse sequence, and calculates a distance from the transmitter by giving different weightings to the pulse signals for the propagation times acquired for the respective pulse signals. As the amplitudes of the pulse signals in the received pulse sequence become larger, the weightings are made larger. [A1735]

"On-vehicle radar device"

An on-vehicle radar device has a transmission section for transmitting a radio wave to an object, a receive section for receiving the radio wave reflected by the object, and a processing section for dividing an object detection range into three or more of a plurality of areas, setting a threshold of an intensity of the radio wave received for each of the plurality of areas, and judging the existence of an object by comparing the intensity of the radio wave and the threshold. This processing section sets, based on an auto-cruise control mode or pre-crash mode of the vehicle, a threshold of a part of an area in the object detection range to be lower than the threshold of the other areas, or changes the threshold of the detection area according to the object detection status. [A1736]

"Obstacle detecting control device of vehicle"

In an obstacle detecting control device installed in a vehicle body and includes a millimeter-wave radar detecting an obstacle in front of the vehicle and an operation control portion controlling a bake device and seatbelt pre-tensioner according to detection results of the obstacle by the radar, there are provided a detection frequency determining portion determining that a detection frequency of obstacle by the radar within a specified period of time exceeds a first frequency, an excessive frequency determining portion determining that a frequency of the above determination by the detection frequency determining portion exceeds a second frequency, and an indication portion and a warning buzzer to warn a passenger of a change of radar axis of the radar when the above determination by the excessive frequency determining portion is made. [A1737]

"Blind spot sensor system"

A blind spot sensor system detects and/or classifies objects in a defined monitoring region of a motor vehicle. The blind spot sensor system contains a first device for emitting a first radar beam, and a second device for emitting a second radar beam. The radial visual range of the first radar beam (beam I) inclines counter to a direction of travel of the motor vehicle and the radial visual range of the second radar beam (beam II) is oriented in an substantially vertical manner in relation to the direction of travel such that the visual range of the radar beams (I and II) at least partially overlap and cover, substantially, the monitoring region. At least the first radar beam (beam I) can be actuated in a CW modulation mode and in a FMCW modulation mode. The blind spot sensor is used in vehicles, for example for assisting in lane changing. [A1738]

"Large scale imaging with spatially-coded waveforms"

A system for locating earth cavities, or items in a building, or structural characteristics having a plurality of transmitters that generate at least a portion of a waveform. Each transmitter divides the waveform into sub-chirp intervals and transmits a known sub-chirp interval from a known location to contact an article of interest. The resulting sub-chirp intervals become a leakage signal that is then received and processed by a receiver. The receiver therein approximates a cavity size, article size, article composition, article location, earth cavity location, or other structural characteristic. [A1739]

"Method and device for calibrating sensors in a motor vehicle"

A method and a device are described for calibrating at least two sensors, the sensors being of a different sensor type. The sensors may be located in or on a motor vehicle. It is possible to calibrate the at least two sensors in one operation by using a calibration object containing reference features for determining calibration data for the at least two sensors. [A1740]

"Monopulse traffic sensor and method"

A method and system for determining a position of a vehicle within a field of view using a traffic sensor are provided. This involves (a) mounting the traffic sensor at a fixed location relative to a road, (b) modulating a microwave signal to produce a periodic time-varying modulated signal, (c) radiating the periodic time-varying modulated microwave signal in a radiation beam at a vehicle on a road to generate a reflected modulated microwave signal, wherein the reflected periodic time-varying modulated microwave signal induces a first received signal at a first receiver antenna and a second received signal at a second receiver antenna, the second receiver being spaced from the first receiver, and, (d) determining the position of the vehicle on the road within the field of view based on the periodic time-varying modulated signal, the first received signal, and the second received signal, wherein the position of the vehicle is determinable during a single period of the periodic time-varying modulated signal. The position comprises a lateral position of the vehicle across a width of the road and a longitudinal position of the vehicle along a length of the road. [A1741]

"System and method for passively estimating angle and range of a source using signal samples collected simultaneously from a multi-aperture antenna"

A system and method for passively estimating range and angle of a source are disclosed. The source may be any wave source including radio-frequency (RF) , optical, acoustic or seismic sources. In some RF embodiments, the system includes a single aperture antenna to simultaneously receive RF signals from the RF source through a plurality of sub-apertures, and a signal processor to perform a proximity test using samples simultaneously collected from the sub-apertures to determine whether or not to calculate angle and range estimates to the source based on either a curved wavefront assumption or a planar wavefront assumption. [A1742]

"Radar for ground speed measurement"

A radar transducer has a planar array antenna mounted on a plate portion of a housing with the microwave transceiver mounted on the opposite side of the plate and carrying a PCB defining the processing section for supplying an output to a cable. The plate portion slides into a plastic receptacle defining the radome for the antenna with a potting compound sealing the open face of the receptacle. The electrical processing section is shielded from extraneous electromagnetic waves without additional metallic shielding elements. The processor is programmable in response to signals received through the output cable so as to re-configure the program thereof so as to change the output to the output cable for different end use controllers and for compatibility with communications protocols. The processor is programmed to carry out a test of the operation of the transceiver and to provide a failure output signal to the cable in the event that the operation is found to be outside predetermined parameters. [A1743]

"In-vehicle radar device"

An in-vehicle radar device includes: phase storing means 12 that prestores the phase of a received wave incoming secondarily from outside a target, received wave importing means 13 that imports the received wave on the basis of a radio wave reception timing determined by a transmission timing of the radio wave, phase detecting means 14 that determines the phase of the received wave imported by the received wave importing means, phase correction amount extracting means 15 that compares the phase prestored by the phase storing means 12 with the phase detected by the phase detecting means 14 and extracts and stores a phase correction amount of each of element antennas, and phase correcting means 16 that corrects the phase of a received signal of each of the element antennas on the basis of the phase correction amount obtained by the phase correction amount extracting means. [A1744]

"Monitor"

A monitoring apparatus of the present application includes: a transmission antenna section that transmits a radio wave of single beam having a wide angle or alternatively a radio wave having a narrower (angular) range in a plurality of beam directions. A receiving antenna section receives the radio wave transmitted by the transmission antenna section and then reflected by a target. A beam switching instrument performs a switching operation such that power is fed to either a first power feed section or a second power feed section, which thereby controls the beam directions of the radio waves to monitor a specified area. [A1745]

"Inter-vehicle control apparatus and distance measurement apparatus"

In an object recognition apparatus for a vehicle which uses intensities of reflected waves from reflecting objects to make a recognition on whether a reflecting object is a vehicle or a non-vehicle, a plurality of transmission waves are emitted to receive a plurality of reflected waves from the reflecting objects, and a decision is made as to whether or not the reflecting object producing the plurality of reflected waves is a unitary reflecting object. If the decision shows a unitary reflecting object, the highest intensity of intensities of the reflected waves from the unitary reflecting object is compared with a reference intensity to makes a decision on whether the reflecting object is a vehicle or a non-vehicle. This enables univocally making a decision for each unitary reflecting object as to whether the reflecting object is more likely to be a vehicle or to be a non-vehicle, thus improving the recognition accuracy. [A1746]

"Simultaneous dual polarization radar system with pedestal mounted receiver"

The present invention relates to a method and apparatus for simultaneous transmission of horizontal (H) and vertical (V) channels in a dual polarized weather radar. The goal of the invention is accomplished by placing the receiver, duplexer and polarizer equipment above the azimuth rotary joint but below elevation rotary joints. The elevation rotary joints and other associated signal paths are calibrated by using a low power signal on the radar's operating frequency that is fed into couplers above the elevation rotary joints. [A1747]

"Motor vehicle wheel behaviour and radar system"

An FMCW radar method is presented in which a radar system of a motor vehicle emits and receives radar waves, and in which a distance between an object and the motor vehicle is determined from a frequency shift between transmitted and received radar waves, and in which a speed of an object is determined from phase positions of received radar waves. The method is defined by the fact that in first time periods (T_A, T_B) it is carried out for objects in at least a first partial area (A, B) of the surroundings of the motor vehicle, and in second time period (T_C, T_D, T_E, T_F, T_G) distances, but not speeds, are determined for objects in at least a second partial area (C, D, E, F, G) of the surroundings. [A1748]

"Methods and apparatus for detecting threats using radar"

Methods and apparatus for early detection and identification of a threat such as individuals carrying hidden explosive materials, land mines on roads, etc. are disclosed. One method comprises illuminating a target with radiation at a first polarization, collecting first radiation reflected from the target which has the same polarization as the first polarization, illuminating a target with radiation at a second polarization, and collecting second radiation reflected from the target which has the same polarization as the second polarization. A threat determination is then made based on the difference between the energy values of the first and second collected radiations. In other embodiments, the difference between energy values is used in conjunction with an evaluation of the returned energy in comparison with returned energy from other targets in order to additionally assess whether the primary target is a threat. [A1749]

"Vehicle sensor system and process"

A process of determining target parameters of an object within a field of detection of an automotive radar system, the process comprising the steps of: (a) establishing a target range from a sequence of ranges, (b) dwelling on the target range for an initial dwell time to obtain sensor data, (c) determining if the sensor data corresponds to the presence of an object or to the absence of an object at the target range based on probability density distributions of an object being present and being absent at the target range, and if such the determination cannot be made, then repeating steps (b) - (c) until the determination can be made, (d) if the sensor data is determined to correspond to the presence of an object in step (c) , then dwelling at the target range for an extended dwell time to obtain additional sensor data for determining the target parameters of the object before proceeding to step (e) , and (e) establishing the next of the sequence of ranges as the target range before reiterating steps (b) - (e) . [A1750]

"System and method for removal of sea-state bias in satellite altimetry data"

A method for correcting bias in altimetry data for ascending satellite tracks and descending satellite tracks. for satellites operating in tandem, calculate ascending track bias between the height measurement made by the first and the second satellites for the ascending tracks in a region, calculate an ascending bias correction by least squares fitting a polynomial to the bias as a function of significant wave height for the ascending tracks, and apply a portion of the ascending track bias to the sea surface height measurements. The correction can be calculated based on only one track and its crossover points. Another embodiment uses data from only one satellite, estimates the sea state bias at the crossover points separately for the ascending and descending tracks, and apportions a percentage of the difference at the crossover points to the tracks based on minimizing the rms differences between the ascending and descending tracks. [A1751]

"Storm top detection and prediction"

A method of predicting storm cell characteristics at a future time is provided. A value relating to a characteristic of the storm cell is determined from reflectivity data processed from signals received from a radar scan of the storm cell. A second storm cell is identified that is part of the same weather system as the storm cell. A plurality of values relating to the characteristic for the identified second storm cell is received from a memory wherein the plurality of values were determined at a plurality of different times. The determined value of the storm cell is compared with the determined plurality of values of the identified second storm cell. A growth rate of the storm cell is determined. A maximum height of the storm cell at a third time in the future is calculated based on the comparison and the determined growth rate and presented to a user. [A1752]

"Precision GPS driven utility asset management and utility damage prevention system and method"

A method and apparatus, including software, for the development and operational use of precise utility location and utility asset management information. Field-usable data sets may be produced that meet standards of accuracy and usability that are sufficient for use by field operations personnel participating in damage prevention activities associated with ground penetrating projects (e.g., excavating, trenching, boring, driving, and tunneling) or other asset applications. Some embodiments relate to integrating utility asset data including coordinate location, and geographical information data using a consistently available and accurate coordinates reference for collecting the data and for aligning the geographical information data. Some embodiments relate to managing projects with equipment that provides real time images and the updating of the data as required with this desired accuracy. [A1753]

"Integrated multi-mixer circuit"

An integrated circuit has an input terminal, a first circuit portion having a first coupler coupled to the input terminal and a first mixer coupled to the first coupler. A first antenna terminal is coupled to the first coupler. A second circuit portion has a second coupler coupled to the input terminal and a second mixer coupled to the second coupler, and a second antenna terminal is coupled to the second coupler. [A1754]

"Time-of-flight-ranging system and method for calibrating such a system"

An embedded calibration mechanism and method for a time-of-flight ranging system. The calibration mechanism (200) comprises a channel (202) having known characteristics. Periodically or as part of a calibration function, a pulse is transmitted through the calibration channel (202) and parameters such transmit pulse delay time and apparent velocity are determined. The calibration parameters or measurements are used to calibrate or compensate operation or measurements from the measurement channel. [A1755]

"Method for producing map images of surface sea current velocity vectors and altimetric radar system using the method"

A method for producing map images of current velocity vectors at the surface sea is described in which beams of electromagnetic waves are emitted towards the surface using a system, towards the left forward and right forward sides of the track of the system, and towards the left aft and right aft sides of the track, from two antennas at a distance from each other along the direction of the track and along a direction perpendicular to the track, and values of roll angle and length of the antenna base connecting the two antennas are determined using differential interferometries applied to the electromagnetic waves reflected by the surface between beams emitted forwards and backwards, the map images being built up using an along-track type differential interferometry, using roll angle and antenna base length values obtained. [A1756]

"Systems and methods for detecting the presence and/or absence of a solid liquid or gas"

Systems and methods are described for detecting the presence and/or absence of a solid, liquid or gas which utilize an RF energy emitter and RF energy detector for determining whether a solid, liquid or gas is present within a defined physical space. More specifically, an RF energy emitter is provided at a first side of a solid, liquid or gas transmission channel and an RF energy receiver/detector is provided at an opposite side of the solid liquid or gas fluid channel. The RF energy emitter either continuously or periodically emits RF energy which in the preferred exemplary embodiment is in the high-frequency or more preferably ultrahigh frequency signal range. The amount of detected RF energy transferred across the channel is used in determining the presence and/or absence of a solid, liquid or gas. [A1757]

"Obstacle and terrain avoidance sensor"

A method and apparatus for terrain mapping and/or obstacle detection for aircraft, including (a) transmitting a non-scanning beam that illuminates the terrain and/or obstacles, (b) receiving a Doppler shifted signal that is Doppler frequency shifted by an amount dependent on an angle between a line of flight of the aircraft and scatterers that reflect the transmitted beam, (c) determining the angle from the Doppler frequency, (d) determining the range of at least some of said scatterers, and (e) determining the azimuth and elevation of the scatterers. [A1758]

"Vehicle-mounted ultra-wideband radar systems and methods"

Vehicle-mounted UWB systems and/or methods for detecting mines and other explosive devices are provided. In certain exemplary embodiments, a system for detecting non-buried mines and/or improvised explosive devices is provided. Distance measuring equipment may be configured to track movement of the system. Substantially forward-looking bistatic antenna transceivers may be capable of collecting range-magnitude radar data over two channels. A first transceiver may capture radar data for a first area, and a second transceiver may capture radar data for a second area. A processor may be configured to: derive range resolution data and cross-range resolution data from the range-magnitude radar data, focus the range resolution data and the cross-range resolution data, based at least on the distance data and an antenna beamwidth pattern associated with the antenna transceivers, and, "and" data for portions of the first area and the second area that overlap. [A1759]

"Method of adaptively adjusting the target detection sensitivity of a motor vehicle radar"

The factory-calibrated target discrimination threshold of a radar-based motor vehicle back-up aid is adaptively lowered under specified vehicle operating conditions to provide enhanced target detection sensitivity without causing false target detection. The threshold is initialized to the calibrated value on transition to the reverse range, and is thereafter subject to adaptive adjustment so long as a target is not detected and a high-clutter condition is not in effect. The adaptive adjustment is carried out by low-pass filtering the resultant data of the radar sensor, starting with a factory-calibrated noise baseline, to determine the current noise level, and then calculating the threshold from the noise level. The adaptive adjustment is suspended for an interval after target detection, and the threshold is increased when a high clutter condition is detected based on rate of change in vehicle speed. [A1760]

"Position detecting system, and transmitting and receiving apparatuses for the position detecting system"

A transmitting apparatus and a receiving apparatus of a position detecting system execute a program including the steps of transmitting a laser beam, detecting an azimuth .alpha. (Y) at which the laser beam is transmitted, detecting an azimuth .beta. at which the reflected laser beam is received, calculating a distance L (1) between the transmitting apparatus and a moving body from .alpha. (Y) , .beta. and a distance D between the transmitting apparatus and the receiving apparatus, and calculating a distance L (2) between the receiving apparatus and the moving body. [A1761]

"Radar system with agile beam steering deflector"

A radar system including a base unit and a radar sensor. The sensor steers a beam in a scanning or tracking manner in both azimuth and elevation. Steering control in azimuth and elevation may be achieved based on configuration settings in the radar sensor processor. The pan-tilt setting may be configured remotely at the base unit. The sensor may include a camera to take panoramic images of the terrain surrounding the sensor, as well as objects-of-interest detected by the system. The sensor is able to transmit radar return information and camera images to the base unit. The base unit is able to display panoramic images and superimpose graphics illustrating a scan profile of the sensor in relationship to the surroundings. The beam steering profile can be controlled by graphically manipulating the profile on the display. This allows configuration of the scanning or tracking profile based on the sensor surroundings. [A1762]

"On-vehicle radar device and vehicle control system"

A radar transceiver of an on-vehicle radar transmits and receives a radar wave. Objects ahead of a vehicle having the on-vehicle radar are sensed based on the reflected radar wave reflected from the objects. A target vehicle to be monitored is extracted from the sensed objects based on the reflected radar wave. Also, a blind spot object, which is present in a blind spot of the target vehicle is extracted from the sensed objects based on the reflected radar wave. [A1763]

"Compression and transmission of weather data"

Weather radar reflectivity data is compressed by converting radar data to image pixels. Next, contours are traced from select groupings of the pixels. Control points are derived from the contours. The control points represent a compressed version of the radar data and may be used to recreate and fill the contours with predefined colors or effects for purposes of visually depicting weather phenomena. [A1764]

"Producing improved mosaic of multiple field radar data product to enable improved weather display"

The system or method reduces the significant degradation of quality in Radar mosaic products that are contaminated by non-meteorological returns. In regions covered by multiple radars, the inventive algorithms utilize an inventive set of coverage-based rules for comparing returns from different radars in order to identify and suppress non-meteorological returns. [A1765]

"System and method for determining position of radar apparatus based on reflected signals"

A system and method for determining position of, for example, a robot based on reflected signals comprises a transmitter for transmitting signals in a number of directions within a range of directions and a receiver for receiving echoes of the signals from any direction in the range. The transmitter has a first rotatable antenna and the receiver has a second rotatable antenna which is mechanically couplable to the second antenna. The received echoes are processed by a processor to derive echo data signals indicative of the distance of the system to one or more reflective surfaces and the direction of the reflective surface (s) relative to the system. The processor is arranged to determine the position of the system relative to a starting position from the derived echo data signals indicative of the distance of the system to the reflective surface (s) and the direction of the reflective surface (s) relative to the system. [A1766]

"Radio wave transmission/reception device for vehicles"

A radio wave transmission/reception device capable of detecting an obstacle in front of a vehicle using radio waves is disclosed. The device includes a radio wave transmission/reception unit, a radio wave reflection unit installed around the radio wave transmission/reception unit and changing the direction of the radio waves such that the radio waves can be propagated forwards from the vehicle, a radio wave rectilinear propagation guide unit installed in front of the radio wave reflection unit and guiding rectilinear propagation of the radio waves, and a viewing window installed in front of the radio wave rectilinear propagation guide unit and oriented toward the radiator grille. The radio wave rectilinear propagation guide unit has an inductive film parallel to the viewing window, with at least a reflection protrusion formed on the inductive film. The device improves the rectilinearity of radio wave propagation and improves the appearance of the radiator grille. [A1767]

"Radar apparatus having wide-angle detection"

A radar apparatus wherein transmission beams are set such that reception intensities corresponding to the transmission beams are gradually reduced from a center direction toward an edge direction of a scanning-angle range. for example, when a vehicle serving as a target is located in the center direction of a transmission beam, the reception-signal intensity corresponding to an adjacent transmission beam is set higher than the reception intensity in the center direction corresponding to the transmission beam. When the scanning-angle distributions of reception-signal intensities corresponding to transmission beams are detected, a scanning angle exhibiting a peak reception-signal intensity is nearer the center of the scanning-angle range than the azimuth angle at which the target is actually located. Thus, a peak reception-signal intensity corresponding to a target located in a region that is a predetermined amount outside the scanning-angle range of a transmission beam appears inside the scanning-angle range. [A1768]

"Object detection apparatus, object detection method, object detection program, and distance sensor"

The present invention provides an object detection apparatus for detecting at least one object existing in an observation subject space. The object detection apparatus comprises an object model recording unit 3 that calculates and records an object model, which is an image expressing the form of a detection subject, a millimeter wave distance sensor 1 that calculates the distance to an object candidate by emitting millimeter waves so as to cover the entirety of the observation subject space at one time, a stereo image sensor 2 that calculates a characteristic image and a distance image having different viewpoints, a control unit 7 that selects an object candidate, a model conversion unit 4 that calculates a comparison model from the object model, a comparison image extraction unit 5 that extracts a comparison image from the characteristic image and distance image, and a similarity comparison unit 6 that calculates the similarity between the comparison model and comparison image, and when a maximum similarity is within a predetermined range, calculates the three-dimensional position of the object from the coordinates of the comparison image and the distance to the object candidate, and outputs the three-dimensional position of the object to the outside. [A1769]

"Signal processing apparatus"

A first AD converter subjects an analog signal to AD conversion by a first AD clock, and a second AD converter subjects the same analog signal to AD conversion by a second AD clock that is shifted in phase from the first AD clock by half cycle. FF circuits store the AD conversion results of the first AD converter and the second AD converter by the first AD clock and the second AD clock, respectively. FF circuits store the data of the FF circuits by the first AD clock, separately. A DPRAM writes the respective data that are stored by the FF circuits by the first AD clock as a group of data, divides the group of written data into the respective data, and reads the respective data by a logic clock in twice to output the data to an integration circuit. [A1770]

"Vehicle control device"

First, it is determined that a measurable distance of a laser radar device is a first threshold value being an extremely short measurable distance or below, because of dirt on a sensor or bad weather. A vehicle control using measured data of the device is thereby prohibited. Second, it is determined that the measurable distance is a second threshold value being a short measurable distance or below but greater than the first threshold value, because of dirt on a sensor or bad weather. A vehicle speed for allowing the vehicle control using the measured data of the device is restricted. Eventually, the vehicle control is executed under these individual conditions. [A1771]

"Signal processing for accelerating moving targets"

A method for performing signal processing for accelerating moving targets, in one implementation, encompasses a method for performing coherent integration of pulses within a CPI for SMTI radar. In an embodiment, the method comprises the steps of determining the Fast Fourier Transform (FFT) for each pulse, and multiplying the FFT by a pulse compression reference function. The method then proceeds by shifting phase of the pulse-compressed FFT by applying a first factor derived from a ground reference point and a second factor derived from a velocity-acceleration hypothesis to provide phase-shifted data, shifting the envelope of the phase-shifted data by applying one factor derived from range history and a second factor derived from a velocity-acceleration hypothesis to provide aligned data, and determining the Inverse FFT for the aligned data to provide a set of target data of the form H (p,i.sub.1,i.sub.2,i.sub.3) , where p is CPI number, i.sub.1 is range index, i.sub.2 is velocity index, and i.sub.3 is coarse acceleration index, the latter three indices each referenced to the starting time of the first CPI. In a further embodiment, the invention encompasses first performing coherent integration for each CPI within a dwell of CPIs, then performing non-coherent integration in an efficient way, taking full advantage of the alignment to the starting time of the first CPI. [A1772]

"Logging device with down-hole transceiver for operation in extreme temperatures"

A logging radar system and method for measuring propped fractures and down-hole formation conditions in a subterranean formation including: a radar source, an optical source, an optical modulator for modulating an optical signal from the optical source according to a signal from the radar source, a photodiode for converting the modulated optical signal output from the optical modulator to the source radar signal, a transmitter and receiver unit, and a mixer. The transmitter and receiver unit receives the source radar signal from the photodiode, transmits the source radar signal into the formation and receives a reflected radar signal. The mixer mixes the reflected radar signal with the source radar signal to provide an output. This technology can be used to describe all fractures connected to the wellbore and differentiate between the dimensions of the two vertical wings of a propped fracture. [A1773]

"Vehicle control apparatus"

An ECU executes a program including a step of outputting a downshift command to an automatic transmission on conditions that a following distance control is being executed, that an acceleration pedal opening degree is detected, and that the detected acceleration pedal opening degree is greater than an opening degree threshold (A) set to be smaller than an opening degree threshold (corresponding to a downshift speed change line) not during execution of the following distance control. [A1774]

"In-vehicle pulse radar device"

Provided is an in-vehicle pulse radar device capable of calculating a distance to a target object based on a delay time between a transmission pulse wave and a received signal. The in-vehicle pulse radar device includes: a reception control unit for controlling passing and blocking of the received signal in synchronization with the transmission pulse wave, a shaping unit for shaping the trailing edge of a pulse wave of the received signal to be delayed, and a sampling unit for sampling the received signal when a predetermined period of time elapses after the reception control unit starts to pass the received signal therethrough. [A1775]

"Method of preventing interference between radars and radar system having interference preventing function"

A radar system mounted on a vehicle includes a first radar and a second radar, each having a transmitter-receiver and a signal processor. The transmitter-receiver transmits radar waves to detect objects such as another vehicle or other obstacles. An operating cycle period T1, T2 and a transmission time X1, X2 during which the radar waves are transmitted are set in both radars to satisfy the formula: KT2+X2+X1.ltoreq.T1.ltoreq. (K+1) T2-X2-X1 under a condition that T1>,T2, where K is a positive integer. By setting both radars in this manner, interference between two radars is avoided without using additional devices in the radar system, and a high detection accuracy is realized. [A1776]

"Radar controlled automatic target illumination system"

A radar controlled automatic target illumination system for marine and other moving vessels. A radar system operably connected to the vessel produces an electronic signal corresponding to an azimuth of a target relative to, and in proximity to the vessel. An array of lights are connected to the vessel, each light being aimed outwardly in a different lighting sector, the sectors being adjacent one to another around the vessel, each of said lights, when automatically activated, illuminating one lighting sector. An electronic processor is operably connected between the radar system and the array of lights for the automatic selective activation of one or more of the lights to illuminate the target within a corresponding lighting sector which the radar system has identified. [A1777]

"Encoded transmitted signals in a simultaneous dual polarization weather system"

A system for simultaneously propagating dual polarized signals in a polarimetric radar system includes a system for coding at least one of the two signals. The simultaneous dual polarization weather radar transmits signals in both the horizontal and vertical orientations at the same time. Upon reception, the signals in each channel are decoded and a number of standard and polarimetric parameters characterizing atmospheric conditions are determined. The accuracy upon which these parameters can be determined depends partially upon the interference between these two channels. The system and method isolates the vertical and horizontal channels to minimize the interference. [A1778]

"Wideband radar"

The invention refers to a method and device for wideband radar, the method comprising: --generating a wideband signal (1, 6) with a bandwidth B, --copying the wideband signal (1, 6) , --transmitting the wideband signal (6') , --receiving a returned echo signal (11) from the transmitted signal (6') , --dividing the copied signal into a number, N.sub.f, of subsequent frequency bands b, --manipulating the copied and divided signal into an anticipated signal (10) by adding a number N.sub.d of anticipated delays and a number of N.sub.D Doppler stretches to the copied and divided signal for each N.sub.f subsequent frequency band b, --dividing the received signal (17) into a number, N.sub.f, of subsequent frequency bands b, --correlating corresponding frequency bands in the divided received signal (17) and the anticipated signal (10) giving N.sub.dN.sub.D correlated signals (19) for determining range (R) to a target and velocity (v) of the target. [A1779]

"Frequency modulation radar apparatus for vehicle use background of the invention"

A frequency modulation radar apparatus for vehicle use can suppress the influence of noise to avoid incorrect estimation due to noise thereby to provide a beat frequency with high accuracy and at high speed without increasing the frequency resolution of the beat frequency that causes an increase in an observation time. The apparatus includes a frequency correction section that calculates a corrected frequency (f.sub.n+.delta.) by adding an amount of frequency correction (.delta.) to the frequency (f.sub.n) of a peak signal, and a CPU that calculates a distance or a relative speed to a target object based on the corrected frequency (f.sub.n+.delta.) . In an FFT calculation section, the frequency (f.sub.t) of the true peak signal is calculated based on the characteristic of a window function, and if the frequency (f.sub.t) thus calculated is determined as an incorrect estimation, the frequency of the true peak signal is further corrected. [A1780]

"Inter-vehicle distance detecting device and inter-vehicle distance detecting method"

There are provided an inter-vehicle distance detecting device and an inter-vehicle distance detecting method which can precisely measure an inter-vehicle distance from a user's own vehicle to a neighboring vehicle even if a radar becomes unable to detect the neighboring vehicle due to the influence of multipath or the like. If the radar does detect a neighboring vehicle, a width of the neighboring vehicle is calculated based on a precise inter-vehicle distance determined by the radar and a precise vehicle visual angle determined from an image taken by a camera, and is stored in a memory, and if the radar becomes unable to detect the neighboring vehicle, an inter-vehicle distance to the neighboring vehicle is calculated according to a trigonometric function based on the precise width of the neighboring vehicle previously stored in the memory and a precise vehicle visual angle determined from an image taken by the camera at this time. [A1781]

"Ultra-wideband transceiver"

An ultra-wideband transceiver that includes a selection mechanism for selecting an internal or an external pulse repetition frequency generator, the output of which is used in the generation of very short duration UWB RF pulses. A detection mechanism is electrically isolated from the oscillator but shares access to a single port that is used for both transmission and reception (e.g. a physical layer transmit/receiver port) of RF signals. The detection mechanism detects changes in the received signal by comparing the received signal to a reference, amplifying these changes, removing high frequency noise and sending the resulting signal for subsequent signal processing, for example a digital signal processing system. [A1782]

"Electronic device and method of controlling same"

An electronic device includes a main body, a drive mechanism configured to move the main body, a detector having a plurality of sensors mounted in the main body for detecting distances to an object which is present in a space around the main body, a calculator configured to calculate a direction of the object relative to the main body based on the detected distances, and a controller configured to control the drive mechanism to change an orientation of the main body dependent on the calculated direction. [A1783]

"Method of generating three-dimensional weather information from airborne weather radar imagery"

A method of displaying real-time, three-dimensional weather information is disclosed. A first representation of a weather event along a first plane is generated from data obtained from a first radar scan. A second representation of the weather event along a second plane is generated from data obtained from a second radar scan. The first and second planes are non-coplanar. The first and second representations are combined to form a three-dimensional model of the weather event. A three-dimensional shape of the three-dimensional model is constructed. The three-dimensional shape is displayed on an avionics display. [A1784]

"Radar for detecting the velocity of a target"

A radar including a target measurement component, a differential velocity calculator and an overall velocity determination portion. The target measurement component transmits and receives an electromagnetic wave over a detection range repeatedly at measurement intervals to measure a position of a target in the detection range and measure a Doppler velocity of the target based on a Doppler shift of the electromagnetic wave reflected from the target. The differential velocity calculator determines a differential velocity of the target based on a change in position of the target during consecutive measurement intervals. The overall velocity determination portion determines a current overall velocity by calculating a weighted average of the Doppler velocity, the differential velocity, and a previously determined overall velocity. [A1785]

"System and method for transmitting high data rate information from a radar system"

A system and method for transmitting high data rate information from a pulsed radar is disclosed. The method includes collecting information using a mobile radar platform. The information is divided into a plurality of segments. Each segment is configured to fit within a time period less than a radar burst signal time period. Each segment is modulated onto a radar burst signal to form modulated radar burst signals. The modulated radar burst signals are transmitted from the pulsed radar system. [A1786]

"Electromagnetic radiation absorber"

An electromagnetic radiation absorber for absorbing radiation in the wavelength range .lamda..sub.min to .lamda..sub.max. The absorber has a conductor layer in contact with a dielectric layer. The conductor layer carries a plurality of apertures of sub-wavelength dimension and the thickness of the absorber is less than .lamda..sub.min/4n, where n is the refractive index of the dielectric. The dielectric layer may be sandwiched between two conductor layers, one of which has the structure described above. The invention is also directed to various articles comprising such an absorber. [A1787]

"Method and device for reducing damage caused by an accident"

A method and device serves to reduce damage caused by an accident, in which a vehicle driver is unable to bring the vehicle that has had an accident into a safe position. A system intervenes in an appropriate manner into the motional behavior of the vehicle, influencing the latter in such a way that the vehicle can be brought into a safe position without the cooperation of the driver (autonomously) . [A1788]

"Radar scanning method"

A scanning method of an in-vehicle scanning-type radar for emitting beams subsequently to execute scanning and for detecting an object includes determining whether or not the object is in an approaching state. When it is determined that the object is not in the approaching state, executed is a first scanning for scanning within a first angle range. When it is determined that the object is in the approaching state, executed is a second scanning for scanning within a second angle range that is narrower than the first angle. A period during which the radar scans the second angle range once in the second scanning is shorter than that during which the radar scans the first angle range once in the first scanning. [A1789]

"System and method for triggering an explosive device"

A proximity fuze (proximity fuse) comprising an ultra wideband (UWB) radar transmitter, a UWB radar receiver, an antenna, a timing system, and a signal processor. One embodiment includes an antenna with an annular conical radiation pattern. In another embodiment, a trigger delay is produced that is related to target detection range. In a further embodiment, multiple range shells are utilized to further discriminate target characteristics including velocity. A method is disclosed that utilizes target range, velocity, signal amplitude, and radar signal phase to identify the target and trigger the detonation. A proximity fuze system having a long storage life is disclosed comprising a proximity fuze element powered by a turbine generator and internal gas source. [A1790]

"System and method for intrusion detection using a time domain radar array"

A system and method for highly selective intrusion detection using a sparse array of time modulated ultra wideband (TM-UWB) radars. Two or more TM-UWB radars are arranged in a sparse array around the perimeter of a building. Each TM-UWB radar transmits ultra wideband pulses that illuminate the building and the surrounding area. Signal return data is processed to determine, among other things, whether an alarm condition has been triggered. High resolution radar images are formed that give an accurate picture of the inside of the building and the surrounding area. This image is used to detect motion in a highly selective manner and to track moving objects within the building and the surrounding area. Motion can be distinguished based on criteria appropriate to the environment in which the intrusion detection system operates. [A1791]

"Methods of estimating precipitation characteristics"

A method of estimating precipitation characteristics including acquiring a radar image including at least a vertical plane of a precipitation zone, processing a vertical profile to generate digital signals representative of reflectivity in vertical direction z, integrating the signals representative of reflectivity by assimilation of a reflectivity vertical profile in an aggregation model to generate a signal representative of the profile in the vertical plane of a mean particle diameter weighted by mass of each particle, and determining concentration of the solid particles on the basis of signals previously determined. [A1792]

"Vehicular radar sensor with distributed antenna"

The radar sensor system includes a radar module, a plurality of antenna units, and a signal carrier. The plurality of antenna units are in communication with the radar module and distributed across a sensing region. The antennas may be connected in a series configuration and, further, may form a loop configuration with the radar module. As such, the radar module may include a centralized signal processor unit configured to receive analog signals from each antenna unit. [A1793]

"System and method for determining patrol speed"

A system for processing radar data from two or more areas of interest is provided, such as for simultaneously processing vehicle speeds in the opposite lane in front of the patrol vehicle and in the opposite lane behind the patrol vehicle. The system includes an antenna signal processor that receives radar data from one or more radar antennae and generates speed data for a first vehicle travelling in a first direction relative to a radar observation point and a second vehicle travelling in a second direction relative to the radar observation point. A display generator system receives the speed data and user-entered display control data, and generates user-readable display data based on the speed data and the user-entered display control data. [A1794]

"Automotive radar system with guard beam"

A predictive collision radar system in a vehicle incorporates a first antenna and a guard antenna, the associated radiation patterns of which overlap with one another, but the radiation pattern of the guard antenna is broader than that of the first antenna. A comparison of signals from the first and guard antennas provides for rejecting targets that are not likely a threat to the vehicle. In one embodiment the first antenna is a multi-beam antenna with an electromagnetic lens, for example, either dielectric or planar, and a signal from a forward looking element thereof is compared with the signal from the guard antenna aligned therewith. In another embodiment, an electromagnetic lens is adapted to cooperate with the guard antenna so as to provide for forming the associated radiation pattern. [A1795]

"Imminent-collision detection system and process"

A process of determining an imminent-collision between a vehicle and an object, said vehicle having a sensing system for obtaining one or more images representing at least one observed object within a field of detection, said process comprising: (a) obtaining one or more images representing an observed object within said field of detection, and (b) determining that a collision between said vehicle and said observed object is imminent when the ratio of the probability that said observed object is actually within a collision zone to the probability that said observed object is actually within a safe zone is greater than a certain value. [A1796]

"Method employing the radar principle for measuring the fill level of a medium in a container"

A method for measuring the fill level of a medium in a container by applying the radar principle, whereby a measuring signal is generated and transmitted in the direction of the medium. A retroreflected portion of the measuring signal is captured and the fill level is determined as a function of the runtime of the measuring signal. The measuring signal is transmitted into multiple mutually different regions and the retroreflected portions of the measuring signal is received at multiple receiving points. In this fashion, it is possible to at least approximate the surface structure of the medium in the container. [A1797]

"System and method for synthesizing data in a radar system"

A system for synthesizing data received from a weather radar system includes a digital signal processor, a data synthesizer, a convolution filter, and data storage. The digital signal processor digitizes reflectivity data from a radar antenna. The data synthesizer generates an M.times.N matrix for a digitized reflectivity data point and populates each element in the M.times.N matrix with the value of the digitized reflectivity data point. The convolution filter calculates a filtered value for each element in the M.times.N matrix. The data storage stores the M.times.N matrix for display. [A1798]

"Utility mapping and data distribution system and method"

A system and method of mapping underground utilities and other subsurface objects involves one or more of acquiring utility location data using a number of different detectors and sensors, processing the multiple detector/sensor output data to produce mapping data, storing the mapping data in a database, and providing access to and use of the stored mapping data by subscribing users on a usage fee basis. [A1799]

"Vehicle radar system having multiple operating modes"

A vehicle radar system includes a processing system which operates in one of a plurality of operating modes which are selected based upon an environment (or changes to an environment) surrounding the vehicle radar system. In one exemplary embodiment, the vehicle radar system is provided as a vehicle radar system which operates in one of: a highway traffic mode and a city traffic mode depending upon whether a vehicle in which the vehicle radar system is disposed is traveling along a highway or through a city. [A1800]

"Smart chaff"

Missile deflector systems for protecting a vehicle from threats that use an infrared sensor for guidance are disclosed. An exemplary missile deflector system can include, for example, a radiation source and one or more deployable smart chaff elements. The light source and the one or more deployable smart chaff elements can direct the threat, such as, for example, a missile, away from the vehicle or, in other embodiments, disable the threat. Another exemplary missile deflector system can include, for example, a smart chaff element with a near-infrared emitter and a plurality of transmitting fibers to transmit the near-infrared radiation out of the smart chaff element. [A1801]

"Doppler tracking optical monopulse"

A method and apparatus for finding a relative direction to, a radial speed of, and a distance to a target is described. A laser source illuminates the target and the Doppler shifted return beam is incident upon a window system at an angle and is transmitted therethrough. The magnitude of the transmitted Doppler shifted beam decreases due to Fresnel transmittance. Opposing photomixers then detect this transmitted Doppler shifted beam, thereby creating a pair of detection signals that are mixed with a local oscillator signal. The mixing process creates Doppler frequency signals that are subsequently processed to determine the radial speed of the target. Due to the Doppler frequency component of the signals, objects in the same direction, but moving at different radial speeds, can be discriminated, as the relative direction processing occurs after the Doppler processing. [A1802]

"Electromagnetic impulse survey apparatus and method utilizing a magnetic component electromagnetic antenna"

The invention relates to an apparatus and method for performing passive geophysical prospecting. More particularly, the present invention relates to an improved apparatus and method for locating and selected subsurface Earth material deposits or geologic formations bearing hydrocarbons, oil, gas, or commercially important ore deposits, precious metals, as a function of impulse discontinuities in the near surface atmosphere of the invention. A passive geophysical prospecting method and apparatus are provided. The apparatus has a magnetic component antenna for detecting electromagnetic radiation naturally emanating from the Earth's surface and an electrical signal from the detected electromagnetic radiation while traversing the Earth's surface by a vehicle traveling over land or water or in an airplane. [A1803]

"Interferometer-type radar"

A transmitter for transmitting signals to targets and a receiver for receiving signals reflected from targets are included. The transmitter outputs CW signals for detecting direction and velocity of the target. The receiver performs: a function of receiving signals reflected from targets with a plurality of receiving antennas at the same time as transmitting from the transmitter, and performing spectral analysis with respect to receiving signals to thereby classify them by velocity component, a function of correlating signals of the receiving antenna systems, a function of integrating the signals correlation-processed, and a function of obtaining phase fronts of signals made incident on an antenna face from the phase differences of signals between receiving antennas, and performing two-dimensional FFT to the outputs to thereby measure the direction and velocity of the target. [A1804]

"Signal processing method for FM-CW radar"

Disclosed is a signal processing method for an FM-CW radar that can accurately detect the relative distance, relative velocity, etc. with respect to a target approaching or receding at a high relative velocity, wherein predicted values for peak frequencies currently detected in upsweep and downsweep sections are computed from the previously detected relative distance and relative velocity, and it is determined whether any of the predicted values exceeds a detection frequency range and, if there is a peak frequency that exceeds the detection frequency range, the frequency is folded and the folded frequency is taken as one of the predicted values, the method then proceeding to search the currently detected peak frequencies to determine whether there are upsweep and downsweep peak frequencies approximately equal to the predicted values and, if such upsweep and downsweep peak frequency are found, the peak frequency approximately equal to the folded predicted value is folded and the folded peak frequency is used. [A1805]

"Weather radar echo tops forecast generation"

Described are a method and a system for generating a short-term forecast of echo tops as defined by weather radar measurements. The method includes receiving echo tops images for different times. An echo tops growth rate and an echo tops maximum value are determined for pixels in one of the images and used to generate echo tops prediction values for an echo tops prediction image. for pixels in regions of the image determined to be subject to convective initiation but where convective weather does not exist, an echo tops initiation height and the echo tops maximum value are determined and used with a predicted precipitation value to generate an echo tops prediction value for each pixel. [A1806]

"Syntactic target classifier"

Disclosed is a Syntactic Landmine Detector. The syntactic landmine detector processes a received signal from a ground penetrating RADAR which contains at least one spatial sequence, the spatial sequence containing relative spatial information locating impedance discontinuities. The spatial sequence is then associated with at least one physical characteristic of a landmine. [A1807]

"Taxi obstacle detecting radar"

A weather radar for detecting taxi obstacles has a transmitter for transmitting intermixed short-range pulses to detect short-range stationary objects and longer-range Doppler pulses to detect long-range moving targets. A receiver receives short-range return pulses from the short-range stationary objects and longer-range Doppler return pulses from the long-range moving targets. A processor is connected to the transmitter and receiver for generating the intermixed short-range pulses and longer-range Doppler pulses and for processing short-range return pulses and longer-range Doppler return pulses. A display displays detected short-range stationary objects and longer-range moving targets. [A1808]

"Digital message display for vehicles"

The digital message display for vehicles detects a tailgater and automatically flashes a warning message, directed to the tailgater, on a message display that is located in the rear window of the vehicle in view of following traffic. In addition to the warning message directed to the tailgater, a distance display is located in view of the vehicle driver to indicate the distance of the tailgater. An audible alarm alerts the driver to the presence of the tailgater. Additionally, a wireless remote control device allows the driver to manually select and display one of a number of pre-defined safety and courtesy messages. Multiple distance sensors provide multiple functional ranges to accommodate varying driving or traffic conditions. [A1809]

"Vehicle-surroundings monitor apparatus"

A vehicle-surroundings monitor apparatus according is provided with a sensor having a transmission/reception means for transmitting an ultrasonic wave to surroundings of a vehicle and receiving a reflected ultrasonic wave from the surroundings, a transmission circuit for generating an ultrasonic wave to be transmitted from the transmission/reception means, and a reception-processing means for processing an ultrasonic wave received by the transmission/reception means, and a control means for supplying a power-supply voltage to the sensor. A power-supply voltage supplied by the control means to the sensor is split into a power-supply voltage to be supplied to the transmission circuit and a power-supply voltage to be supplied to the reception-processing means. [A1810]

"Ground-speed measuring apparatus"

This invention provides a ground-speed measuring apparatus for a vehicle that can detect a velocity along the movement of the vehicle (in the fore direction) , a velocity across the movement of the vehicle (in the athwartships direction) , a side-skid angle of the vehicle, and an angular velocity of the vehicle. A ground-speed measuring apparatus comprising three or more transceivers each of which contains a transmitter for transmitting a wave and a receiver for receiving a reflection of the wave transmitted from the transmitter, wherein at least three of said transceivers are placed outside a cylindrical area whose axis of symmetry passes through a point on the floor of the vehicle, three straight lines which respectively pass through said transceivers perpendicularly thereto intersect with each other or skewed in said cylindrical area, and the transmitter of each transceiver is at a preset angle with the floor of the vehicle. [A1811]

"Variable loop gain and resolution pulse system and method with point target editing capability"

A weather radar system is coupled to antenna. The weather radar system includes a processor for generating pulses and for processing return pulses received by the antenna. The processor generates high resolution data from the return pulses. The processor uses the high resolution data to perform high resolution radar analysis including removal of point and/or point-like target returns and reassembles the high resolution data to perform high gain radar analysis at lower resolutions. [A1812]

"Sensor for transmitting and receiving electromagnetic signals"

The invention relates to a sensor comprising a housing, inside of which a transmitting antenna array that transmits electromagnetic transmission signals in a radiation area and a receiving antenna array that receives received signals reflected by at least one object located within the radiation area are provided. The inventive sensor is designed in such a manner that the transmitting antenna array is provided for transmitting transmission signals in a main radiation area (3) and in a secondary radiation area (4) situated at an angle, thereto, and in that the receiving antenna array (TX) is provided for receiving received signals reflected in both radiation areas (3, 4) . This makes it possible, for example when used in a monitor vehicle (5) , to monitor the area behind and next to the motor vehicle (5) with a single transmitting antenna (1) . [A1813]

"Measuring wind vectors remotely using airborne radar"

Airborne meteorological radars and related networks and models. In one embodiment a network for creating a meteorological model includes a mobile sensing node and a modeling node. The sensing node includes a meteorological RADAR that senses the wind velocity. Data from the meteorological RADAR regarding the wind velocity is received by a processor of the modeling node which determines a model of the wind from the wind velocity. The modeling node combines data from a second sampling node with the data from the first sampling node to create a resultant wind velocity vector. Preferably, the modeling node and the sampling node (s) communicate over an airborne WAN. Another embodiment provides a method of measuring the wind velocity. The method includes steering an RADAR signal out of the plane of travel of the mobile platform. The wind velocity is measured using a return of the RADAR signal. [A1814]

"Airborne weather profiler network"

Apparatus and methods for remotely sensing meteorological conditions and for building models from the sensed conditions. More particularly, networks and systems are provided for gathering remotely sensed profiles of the meteorological conditions and for building the meteorological model. The networks and systems can also predict the weather. Also, various remote profilers are provided including LIDAR, RADAR, nano-sondes, microwave, and even GPS (Global Positioning System) related instruments. [A1815]

"Compression and transmission of weather data"

Weather radar reflectivity data is compressed by converting radar data to image pixels. Next, contours are traced from select groupings of the pixels. Control points are derived from the contours. The control points represent a compressed version of the radar data and may be used to recreate and fill the contours with predefined colors or effects for purposes of visually depicting weather phenomena. [A1816]

"Detection of a concealed object"

Disclosed are systems, methods, devices, and apparatus to determine if a clothed individual is carrying a suspicious, concealed object. This determination includes establishing data corresponding to an image of the individual through interrogation with electromagnetic radiation in the 200 MHz to 1 THz range. In one form, image data corresponding to intensity of reflected radiation and differential depth of the reflecting surface is received and processed to detect the suspicious, concealed object. [A1817]

"Millimetre-wave illumination source"

An illumination source of predominantly non-directional and incoherent millimeter-wave radiation for illuminating an area for passive millimeter-wave imaging comprises a container with at least a partly reflective internal surface and a plurality of exit apertures and a primary source of millimeter-wave radiation for emitting millimeter-wave radiation into the container. The primary source and the container are arranged so that a proportion of the millimeter-wave radiation emitted by the source undergoes reflection within the container before being emitted through the apertures, such that the different paths lengths are at least equal to the coherence length of the radiation. This is facilitated if the bandwidth of the radiation is preferably at least 1 GHz. The container may be a box in which a waveguide is used to couple radiation from the primary source into the box. Alternatively, the container may be formed from a mesh and the plurality of holes is provided by the holes in the mesh. [A1818]

"System and method for intrusion detection using a time domain radar array"

A system and method for highly selective intrusion detection using a sparse array of time modulated ultra wideband (TM-UWB) radars. Two or more TM-UWB radars are arranged in a sparse array around the perimeter of a building. Each TM-UWB radar transmits ultra wideband pulses that illuminate the building and the surrounding area. Signal return data is processed to determine, among other things, whether an alarm condition has been triggered. High resolution radar images are formed that give an accurate picture of the inside of the building and the surrounding area. This image is used to detect motion in a highly selective manner and to track moving objects within the building and the surrounding area. Motion can be distinguished based on criteria appropriate to the environment in which the intrusion detection system operates. [A1819]

"Vehicle-mounted millimeter wave radar device, millimeter wave radar module, and manufacturing method thereof"

An object of the present invention is to provide a millimeter wave radar device and module that provides a hollow structure while assuring adequate moisture resistance. A multilayer substrate on which at least one millimeter wave MMIC is mounted and a cap for forming a hollow around the MMIC are joined together with an adhesive or other similar organic member to obtain a high-frequency characteristic. The resulting assembly is housed in a case and covered with a moisture resistance by a gelled organic resin. The nonairtight structure obtained in this manner permits the use of low-cost members and provides increased productivity. [A1820]

"Polarization and frequency diverse radar system for complete polarimetric characterization of scatterers with increased scanning speed"

A method and apparatus is provided, whereby a scanning, polarization and frequency diverse radar system measures the complete polarimetric characterization of weather targets without loss of scanning speed and without an additional ambiguity in the Doppler velocity beyond that given by Nyquist's sampling theorem. In one embodiment, a linear combination of a horizontally and a vertically polarized signal are transmitted at a predetermined first frequency. Cotemporaneously or nearly cotemporaneously with the transmitted signal of the first frequency, a horizontally polarized signal is transmitted at a predetermined second frequency. Horizontal and vertical receive channels receive echoes at the predetermined first frequency to determine, but not limited to determine, the co-polar elements of the scattering matrix. Horizontal and vertical receive channels receive echoes at the predetermined second frequency to determine, but not limited to determine, the cross-polar elements of the polarization matrix. The predetermined first and second frequencies are selected to maximize isolation yet allow practical implementation. [A1821]

"Atmospheric refractivity profiling apparatus and methods"

Apparatus and methods for characterizing atmospheric refractivity and its evolution in time and space utilizing passive radiation emission measurement devices are disclosed. Based on an instrument such as a passive microwave radiometer, ancillary meteorological measurements and other information and observations, the apparatus and methods provide useful signatures for characterizing atmospheric refractivity. The system can observe to any vector in the sky, giving directional as well as zenithal measurements of the refractivity profile, its spatial and temporal gradients, and the spatial and temporal trending of the profile and its gradients. [A1822]

"Determining statistical descriptors of a signal from a set of its samples"

An entity is subjected to an interrogating signal, and the reflection from the entity is repeatedly sampled to obtain a first set of values each dependent on the intensity of the reflected signal. A logarithmic transformation is applied to the sample values to obtain a second set of values. A set of descriptor values is derived, the set comprising at least a first descriptor value (L) representing the difference between the mean and the median of the second set of values, and a second descriptor value (D) representing the mean of the absolute value of the deviation between each second set value and an average of the second set of values. [A1823]

"Real-time multistatic radar signal processing system and method"

A real-time signal processing engine robustly detects, localizes, tracks and classifies ground targets based on radar signals from a multistatic radar system. The system differentiates between different targets based on an optimized cost function, which can include the total returned normalized pulse energy. The local transmitters/receivers can communicate with each other via the transmitted radar signals. [A1824]

"Apparatus for collecting ground radar data with polarization information"

The present invention concerns an apparatus for collecting ground radar data with polarization information comprising a main body exhibiting structure for moving the apparatus along the ground, a part that rotates in relation to the main body supporting a pair of antennas of transmitter and receiver type, a power source with connected control unit for controlling and governing the ground radar, a transmitter unit electrically connected to one of the pair of antennas for generating and transmitting radar pulses and a sampler unit electrically connected to the other antenna for receiving the reflected radar pulses. To improve signal quality and reduce sensitivity to interference, the rotating pair of antennas support the transmitter unit, sampler unit and A/D converter contained in the sampler unit, the power source and the control unit are located in the main body and are electrically connected to the transmitter unit and sampler unit via a slip-ring arrangement, in which the radar signals are conveyed digitally via the slip ring arrangement. [A1825]

"Adaptive antenna for controlling the weighting on a plurality of antenna elements"

An optical subscriber system according to the present invention has an adaptive antenna having a plurality of antenna elements, for controlling the weighting on the antenna elements thereby to radiate beams that are adapted to radio wave environments, a position estimator for estimating the position of a mobile unit, a beam combiner for weighting signals received from the mobile unit by the antenna elements and combining beams, and a weighting coefficient generator for correcting weighting coefficients adapted to radio wave environments, which give initial weights as weights to form nulls in bearings other than the mobile unit based on the position of the mobile unit which has been estimated by the position estimator, for thereby reducing a time required for convergence. [A1826]

"System and method for measuring characteristics of a continuous medium and/or localized targets using multiple sensors"

A method and system is provided for obtaining data indicative of at least one characteristic of a continuous medium or at least one localized target located within a predetermined volume of space. The system includes a sensor configuration and a processing circuit. The sensor configuration includes a plurality of sensors for acquiring a plurality of signals from the continuous medium or the target (s) . The plurality of sensors have centers spatially separated from each other in at least one spatial dimension. The processing circuit is configured for obtaining data indicative of the characteristic or characteristics of the medium or the target by calculating a plurality of powered weighted increments using the plurality of signals acquired by the sensor configuration and by using a plurality of models for relating the plurality of powered weighted increments to the characteristic or characteristics of the medium or the target. The selected characteristics of the medium or the target can be estimated with better accuracy and temporal and/or spatial resolution than is possible with prior art correlation function, spectra, and structure function-based methods and systems. In contrast to prior art methods and systems, the invention is not sensitive to signal contaminants with large temporal scale such as ground and sea clutter, and is not sensitive to low frequency external interference. The invention is capable of estimating various characteristics of the medium or target, for example, size, shape, visibility, speed, direction of the motion, and rates of changes of the above characteristics. [A1827]

"Method and apparatus for interferometric radar measurement"

In a method for interferometric radar measurement, at least two side looking RADAR systems on satellite and/or missile-supported platforms illuminate a common surface area by means of microwave signals. A first side looking RADAR system sends a first radar signal on a first transmit frequency, and at least a second side looking RADAR system sends at least a second radar signal on at least a second transmit frequency. At least one of the at least two side looking RADAR systems receives the at least two interfering radar signals reflected on the common surface area, determines difference phases of the received radar signals from the interferograms, determines therefrom a drift of a system clock of the at least two side looking RADAR systems, and compensates the determined drift. [A1828]

"Parachuted radar decoy"

A radar decoy having radar reflectors disposed in the interior of the inflated canopy of a descending parachute as a first set of four corner reflectors, and a second set of corner reflectors disposed on the exterior of the canopy integral with the first set of corner reflectors, to form an octahedron of eight corner reflectors. The radar decoy is pliable and folded with the parachute for stowage in the interior of a canister. When loaded on a vehicle flying in a trajectory, the canister may open at a point P on the trajectory, to release the parachute, and thereby deploy the radar decoy to become operative. [A1829]

"Periphery monitoring system"

In a periphery monitoring system for monitoring movements of a mobile object around an installation location of a Doppler sensor, a signal output from the Doppler sensor is subjected to an FFT analysis, and a total sum of the frequency levels of all of the frequency bands obtained through the FFT analysis is calculated at predetermined time intervals. A reference level and abnormal level are set based on the calculated total sum. If the calculated total sum exceeds the abnormal level and falls to or below the abnormal level before a first set period passes since the exceeding of the abnormal level, the periphery status is determined to be abnormal. If the total sum exceeds the abnormal level but does not fall to or below the abnormal level even after the first set period passes since the exceeding of the abnormal level, the periphery status is determined to be normal, and the reference level is updated to a new reference level set based on total sums calculated during the first set period. [A1830]

"Buried object detection sensor"

A combined type buried object detection sensor is provided, in which a MD and a GPR are integrated to improve a detectivity. A buried object detection sensor 10 has a constitution in which plural antenna elements composing a GPR 14 are disposed on a circumference, an inner coil 16 of a MD 12 is arranged at a center portion of the GPR 14 and an outer coil 18 of the MD 12 is arranged at a periphery of the GPR 14, the GPR 14 has slits 20 separating the respective antenna elements, and the slits 20 between adjacent antenna elements are connected by a metal leaf 36. [A1831]

"Rocket-powered sensor target assembly"

A rocket tube for housing a reloadable rocket motor is connected to a spacer element and a wire-rider element. A sensor target for reflecting radar signals is screwably attached to the rocket tube. The sensor target is provided with a plug for effectively sealing one end of the rocket tube with the other end of the rocket tube being utilized to reload a rocket motor upon completion of a test firing. A guide wire is threaded through the wire-rider element with the guide wire serving as a travel path. The rocket tube, spacer element, and wire-rider element are connected in an easily assembled, aerodynamic manner that allows for multiple radar tests using the same components within a brief time period. [A1832]

"Method for reconstructing complex wave attributes from limited view measurements"

A method is disclosed for reconstructing complex wave attributes from limited view measurements of a scattering object. The method involves the analytic continuation of the Fourier transform of the object function into the area in which there is an absence of K-space coverage by requiring objects to be an even function. (It is assumed that physical objects are even functions, and it is this assumption that allows analytic continuation.) When the object function is not centered at the origin, the measurements are shifted to the origin prior to determining the analytic continuation and returned to their original location following analytic continuation. [A1833]

"System and method for ground proximity warning with enhanced obstacle depiction"

Systems and methods for displaying ground obstructions on a visual display are disclosed. In an embodiment, a ground proximity warning system includes at least one aircraft sensor system operable to acquire aircraft data and a ground proximity warning computer coupled to the aircraft sensor system to process the aircraft data that generates ground proximity warning data corresponding to a sensed ground obstruction. An indicating system including a visual display device then presents an image of a visual symbol corresponding to the sensed ground obstruction. At least one of the computer and the visual display device is controllable to selectively display the visual symbol. [A1834]

"RF system for tracking objects"

A system for tracking an object in space for position, comprises a transponder device connectable to the object. The transponder device has one or several transponder aerial (s) and a transponder circuit connected to the transponder aerial for receiving an RF signal through the transponder aerial. The transponder device adds a known delay to the RF signal thereby producing an RF response for transmitting through the transponder aerial. A transmitter is connected to a first aerial for transmitting the RF signal through a first aerial. A receiver is connected to the first, a second and third aerials for receiving the RF response of the transponder device therethrough. A position calculator is associated to the transmitter and the receiver for calculating a position of the object as a function of the known delay and the time period between the emission of the RF signal and the reception of the RF response from the first, second and third aerials. A method is also provided. [A1835]

"Short-range automotive radar transceiver"

Automotive vehicle including a radar transceiver each including a heterodyne active IMPATT multiplier module arranged to receive a signal from a VCO, a first balance mixer arranged to receive a signal from a VCO, a second balance mixer arranged to receive a signal from a receive antenna and the IMPATT multiplier module and derive a first intermediate frequency signal, a first amplifier for amplifying the output of the second balance mixer and providing the amplifier output to the first balance mixer, and a second amplifier for amplifying the output of the first balance mixer. The vehicle also includes a processor which receives output from the second amplifier of each transceiver and generates a control signal for controlling one or more vehicular components based on the output from the second amplifier (s) . The components can be part of a collision avoidance system, blind spot monitoring system and the like. [A1836]

"Methods for detection and tracking of targets"

The present invention relates to active sensor applications, and more particularly is directed to efficient systems and methods for detection and tracking of one or more targets. The invention provides a method for receiving signals reflected from one or more targets, processing the received signals and the transmitted signal to compute two or more slices of the cross ambiguity function associated with the signals, and estimating the signal delay and the Doppler shit associated with the targets from the computed slices. [A1837]

"Method and system for determining the position of marine vessels and similar objects"

A method for determining the relative position between two or more objects in a marine environment, including waterways, of which at least one object can be maneuvered relative to one or more other objects. At least one interrogator is arranged on one or more of the objects and sends a radio wave signal to at least one transponder arranged on one or more of the other objects. The novel method is the use of a FMCW radar in the interrogator, the use of the transponders for including identity tags into the signals to be reflected to the interrogator, and attitude determination. A system for this determination is also described. [A1838]

"Systems and methods for displaying hazards"

A system, according to various aspects of the present invention, provides a presentation to a hazard display. The system includes a memory having surveillance data and a processor. The processor updates an image in accordance with the surveillance data to provide an updated image. The processor also prepares a presentation in accordance with the updated image. The processor further provides the presentation to the hazard display. At least one of updating, preparing, and providing utilize a first scan mode for a hazardous region of the presentation and a second scan mode for a nonhazardous region of the presentation. [A1839]

"Velocity sensor and ground vehicle velocity sensor using the same"

There is provided a highly accurate velocity sensor having a reduced detection error. A sensor circuit unit generates an electromagnetic wave and emits it from a transmission antenna. Furthermore, a reception antenna receives a reflection wave from the ground and a mixer mixes it with a local signal, thereby generating a low-frequency signal. The electromagnetic wave emitted from the sensor circuit unit shapes a beam by a dielectric lens before emitting it toward the ground. Here, the beam shape is such that the beam width in the vicinity of the sensor is smaller than the beam width in the vicinity of the ground. [A1840]

"Multi-mode landmine detector"

An multi-mode target detection system includes a ground penetrating metal detector and a ground penetrating radar detector permitting operation of the system in a variety of target detection modes. The system includes a control section having a selection device for selecting at least two operating modes from the group consisting of a buried land mine detection mode, a through wall detection mode, a perimeter warning mode, a buried cache detection mode and an in-wall cache detection mode. [A1841]

"Radar apparatus and processing method for detecting human carried explosive devices"

A linear FM pulse radar with Doppler processing of co-polarized and cross-polarized radar return signals isolates the target echo signal content associated with a moving pedestrian to provide high quality target echo data for standoff HCE detection based on polarimetric signature analysis. Baseband co-polarized and cross-polarized radar return signals are repeatedly and coherently integrated across numerous successive radar return pulses to create co-polarized and cross-polarized range vs. velocity (Doppler) data maps. The co-polarized data map is used to identify a moving pedestrian, and co-polarized and cross-polarized data subsets corresponding to the identified pedestrian are extracted and subjected to polarization signature analysis to determine if the pedestrian is bearing explosive devices. Low pass filtering of the of the baseband co-polarized and cross-polarized radar return signals prior to integration provides range aliasing to reject signal content associated with objects beyond the unambiguous range of the radar apparatus. [A1842]

"Axial deviation determining method for on-vehicle radar"

An on-vehicle radar and a method of determining an axial deviation of the radar using stationary objects free of erroneous determination are disclosed. The amount of axial deviation of the radar is determined from the calculated stationary object line based on the distribution of stationary objects. In the case where such a factor for determining the calculated stationary object line as to reduce the calculation accuracy of axial deviation is detected in the distribution of stationary objects, the calculation of the amount of the particular axial deviation is canceled. [A1843]

"Device and a method for accurate radar level gauging"

The invention discloses a device for using radar signals to measure the vertical distance (h) to a surface, comprising a first transmitter and a first transmitting antenna for transmitting radar signals, and a first receiver and a first receiving antenna for receiving radar signals. The device additionally comprises a second receiving antenna and a second receiver, the second receiving antenna being arranged at a first predetermined horizontal distance (.DELTA.x) from the first receiving antenna, the device also being equipped with means for using signals which have been transmitted from the first transmitting antenna and received at the first and second receiving antennas to calculate the vertical distance to the surface. Suitably, the first and second receivers are one and the same physical unit, to which both the first and the second receiving antennas are coupled. [A1844]

"Meta-materials based upon surface coupling phenomena to achieve one-way mirror for various electro-magnetic signals"

A one-way reflective sensor shield with an increased bandwidth meta-materials coating is provided which substantially reduces or eliminates deleterious electronic signatures and backscattering. The one-way reflective sensor shield with meta-materials coating operates according to surface plasmonic coupling phenomena and achieves a mirror-like one-way reflection of electromagnetic signals. In this arrangement, the meta-materials coating is composed of a dielectric material, and the corrugated metal strips are composed of a metallic conductive material with a negative dielectric constant, to allow surface plasmonic coupling between the plasma in the metal and the incident electromagnetic field. Surface plasmons occur at the interface of a material with a positive dielectric constant, such as dielectric surface, with that of a negative dielectric constant, usually a metal or doped dielectric, such as the metal strips. Sensor devices and sensor shielding systems are also provided. [A1845]

"Near field electromagnetic positioning system and method"

A system and method for electromagnetic position determination utilizing a calibration process. for calibration, a transmitter is positioned at multiple locations in an area of interest and multiple receivers receive and record signal characteristics from the transmitter to generate a calibration data set. The unknown position of a transmitter may be determined by receiving signals from the transmitter by multiple receivers. A locator data set is generated based on the comparison between two received signal characteristics determined for each receiver. The locator data set is compared with the calibration data set to determine the unknown position. In one embodiment, the signal comparisons are the differences between electric and magnetic field phase. Further embodiments utilize signal amplitude differences. A reciprocal method utilizing a single receiver and multiple transmitter locations is disclosed. A further method is disclosed for determining position by utilizing signals available from existing installed wiring such as power wiring. [A1846]

"Detecting small, time domain impulsive communications signals"

A method and system are disclosed for generating and detecting secure UWB or relatively small time domain impulsive communications signals. A transmitter generates a sequence of at least three pulses having a predetermined template, and the pulses are generated in a predetermined sequence anywhere within a series of predetermined time intervals. A receiver detects the sequence of pulses within the predetermined intervals by convolving the predetermined template with the received signal. The information represented by the detected pulses is preferably used for secure communications. [A1847]

"Vehicle obstacle warning radar"

A method for detecting an object using a transmitting antenna and an array of receiving antennas. The method comprises the step of transmitting a signal from the transmitting antenna. The magnitude and phase of a respective received signal at each of the receiving antennas is then measured. Next, the magnitude of a weighted sum of respective phase-compensated signals related to each of the receiving antennas is determined. The magnitude of the weighted sum is compared against a first predetermined threshold value and, optionally, a second predetermined threshold value. An object may be detected by considering a ratio of the magnitude of the weighted sum to the first predetermined threshold value and, optionally, to the second predetermined threshold value. In some embodiments, a second array of receiving antennas may be provided to facilitate the determination of the location of the object. [A1848]

"Sensor arrangement and method for regulating the distance of motor vehicles"

A sensor system on motor vehicles for locating objects in front of the vehicle, wherein at least two sensors, each having a locating depth of at least 50 m, are arranged in such a way on both sides of longitudinal center axis of the vehicle that their locating angular ranges together cover the entire vehicle width as of a first distance d1, and overlap each other as of a second distance d2. [A1849]

"Holographic arrays for multi-path imaging artifact reduction"

A method and apparatus to remove human features utilizing at least one transmitter transmitting a signal between 200 MHz and 1 THz, the signal having at least one characteristic of elliptical polarization, and at least one receiver receiving the reflection of the signal from the transmitter. A plurality of such receivers and transmitters are arranged together in an array which is in turn mounted to a scanner, allowing the array to be passed adjacent to the surface of the item being imaged while the transmitter is transmitting electromagnetic radiation. The array is passed adjacent to the surface of the item, such as a human being, that is being imaged. The portions of the received signals wherein the polarity of the characteristic has been reversed and those portions of the received signal wherein the polarity of the characteristic has not been reversed are identified. An image of the item from those portions of the received signal wherein the polarity of the characteristic was reversed is then created. [A1850]

"System and method for passively estimating angle and range of a source using signal samples collected simultaneously from a multi-aperture antenna"

A system and method for passively estimating range and angle of a source are disclosed. The source may be any wave source including radio-frequency (RF) , optical, acoustic or seismic sources. In some RF embodiments, the system includes a single aperture antenna to simultaneously receive RF signals from the RF source through a plurality of sub-apertures, and a signal processor to perform a proximity test using samples simultaneously collected from the sub-apertures to determine whether or not to calculate angle and range estimates to the source based on either a curved wavefront assumption or a planar wavefront assumption. [A1851]

"Instantaneous passive range finding"

A method and apparatus for use in determining the range in a single time sample from a platform to a target are disclosed. The method includes receiving radiation emanating from the target at two points on the platform in a common time sample, detecting the received radiation and generating a signal representative thereof, and processing the signal. The signal is processed to determine a respective angle to target from two points on the platform by using a correlation between received signal amplitude and respective angle, and determine the range from the platform to the target from the respective angles and the separation distance between said two points in a single signal-to-noise sufficient sample. The apparatus includes a plurality of optical channels through which the apparatus can receive radiation emanating from the target, the optical channels and a plurality of electronics. The optical channels include a windowing system through which the radiation is received, a sensor capable of detecting the received radiation and generating a signal representative thereof, and a light tube between the windowing system and the detector. The electronics are capable of processing the signal in accordance with the method set forth above. [A1852]

"Method and device for course prediction in motor vehicles"

A method and a device for course prediction in motor vehicles, which have a position-finding system for objects situated in front of the vehicle, where a function describing the path of the roadway is calculated on the basis of measured distance and angular data, in that several fixed targets are identified and tracked and supplied (subjected) to a statistical evaluation, a plausibility criterion being that at least one parameter of the functions, which describe these roadway paths, has a significant frequency maximum at the value which corresponds to the real roadway path. At the beginning of the evaluation, the frequency distribution for all parameters is set to a predefined frequency value, and the frequency values of the parameters are reduced or increased by a predefined numerical value as a function of the position of fixed targets or vehicles. [A1853]

"Method and apparatus for detection of signal having random characteristics"

A method for detecting a signal having random characteristics. A plurality of bursts are detected within a predetermined time period. The plurality of bursts are evaluated to determine how many pulses each of the plurality of bursts contains. The signal having random characteristics is present responsive to the ratio of number of bursts containing a first predetermined number of pulses being approximately equal to number of bursts containing a second predetermined number of pulses. for signals such as a Bin-5 Test Signal, the signal is determined to be present responsive to the number of singletons (bursts having one pulse) , the number of pairs (bursts having two pulses) and the number of triplets (bursts having three pulses) being approximately equal. [A1854]

"Method and apparatus for detecting slow-moving targets in high-resolution sea clutter"

An apparatus for non-coherently detecting slow-moving targets in high resolution sea clutter includes a binary detector for converting high resolution radar returns, produced in response to a radar pulse scan of a plurality of identical pulses, into corresponding binary outputs based on a comparison of range cell magnitudes with a detector threshold. A range extent filter converts these binary outputs into an output indicating the presence or absence of a cluster of the returns that are closely spaced in range, while a third, persistence integration stage determines target range extent persistence over a predetermined time period. A detector stage declares detection of a target based on a comparison of the output of the third stage with a selected threshold. [A1855]

"Vehicular radar device"

A vehicular radar device detects an object within a detection area on the basis of detection data having a reception intensity exceeding a predefined threshold. The detection data is contained in reflected-wave data on waves irradiated into the detection area outward of a vehicle provided with the vehicular radar device. The device is capable of varying a direction or/and a range of the detection area in a vertical direction, and setting, during a normal time, the direction or/and the range of the detection area in the vertical direction to a normal state in which the object is correctly detected, and performing a detection operation in the normal state. [A1856]

"Radar system and car radar system"

A power supply apparatus controls the gate and drain power supplies at the rise time so that an output voltage of the gate power rises earlier than that of the drain power supply. Another power supply control apparatus controls the gate and drain power supplies at the fall time so that an output voltage of the gate power supply fails later than that of the drain power supply. Another power supply control apparatus turns off the drain supply of the FET among power supplies when it is detected by a voltage monitor whenever either of output voltages or the power supplies are not within said specified range. [A1857]

"Vehicle mounted system for detecting objects"

A method for object detection using vehicle-mounted sensors is provided, the sensing ranges of which sensors overlap at least partially. In this context, signals of at least two sensors having sensing ranges with essentially identical coverage, and additional signals of at least one additional sensor having a sensing range which only partially overlaps with the sensing ranges of the at least two sensors, are evaluated. An object is identified as relevant when it is detected by at least three of the sensors. [A1858]

"Distance measuring device for a vehicle"

A distance measuring device for a vehicle emits electromagnetic waves forward for a scan both in horizontal and vertical directions. It is judged from received light whether or not the distance to a detected object is within a specified preset range. If the distance is found to be within this range and if at least two specified conditions are satisfied, this object is regarded as a vehicle in the subsequent scans and a flag is set to this effect. One of these two conditions requires this object to have been judged as being a front going vehicle continuously over a time longer than a preset minimum time length. The second condition is that the difference between the distance to this object measured by a scan that is the highest or nearly the highest in the vertical direction and the measured distance to a front going vehicle corresponding to the object is within a predetermined range. [A1859]

"Method for detecting an obstacle around a vehicle"

If the maximum time width Lt of the intensity of received light of reflected waves from a vehicle ahead is smaller than a reference time width, it is judged that the vehicle ahead is positioned in proximity to the detection limit distance of an obstacle detection device for vehicle. Thus, there is no problem, for example, even if a cut-in vehicle is present in reality between the vehicle ahead and the vehicle of interest and nevertheless, the distance to the cut-in vehicle cannot be detected. It can be judged whether the vehicle ahead is positioned in proximity to the detection limit distance of the device by judging the magnitude relation between Lt and the reference time width. As a result, the detecting capability of the device can be judged with accuracy. [A1860]

"Transmitter location for ultra-wideband, transmitted-reference CDMA communication system"

A system and method involve tracking the location of objects within an area of interest using transmitted-reference ultra-wideband (TR-UWB) signals. The system includes at least three base stations communicating with a central processor, at least one mobile device and at least one fixed beacon transmitter of known location. The mobile device is equipped with a transmitter for transmitting a TR-UWB signal to a base station, which then determines a location of the mobile device based on time difference of arrival information between the beacon transmitters and mobile devices measured at all the base stations. Preferably, the area of interest includes a plurality of mobile devices each transmitting a delay-hopped TR-UWB signal according to a code-division multiple access scheme. The mobile devices may be attached to a patient and/or a medical asset within the hospital for tracking purposes. Additionally, patient medical information may be transmitted with the TR-UWB signals to allow patient monitoring to occur simultaneously with asset/patient tracking. [A1861]

"Car reversing radar sensor having fine-tuning feature"

A car reversing radar sensor having a fine-tuning function includes a cylinder, a sensor module, a front cover, a packing block and a back cover. The sensor module is fitted in the cylinder and a sensing angle thereof can be adjusted. The packing block includes a push part a brake part, and a stick part. The packing block is mounted on the cylinder for securing the sensor module at a desired sensing position. [A1862]

"Multipath height finding method"

A method for determining the height H.sub.T of a target above a surface, the method comprising the steps of determining a distance R from a source to a target, determining a distance L representative of a distance traveled by a signal from the target that is reflected by the surface to the source, determining a height H of the source above the surface, and determining the height H.sub.T of the target using the equation: .times. ##EQU00001## Associated target height errors that result from input errors can also be determined using the equation. [A1863]

"Surveilled subject imaging with object identification"

An imaging system can include an antenna apparatus configured to transmit toward and receive from a subject in a subject position, millimeter-wave electromagnetic radiation. A subject may include a person and any object or objects with the person. A controller can include a transceiver configured to operate the antenna apparatus and produce an output representative of the received radiation, and a processor adapted to produce from the transceiver output, image data representative of an image of the subject. At least a first portion of an image signal representative of radiation received by an antenna apparatus may be used to produce first image data representative of a first image of at least a portion of the subject. Second image data representative of a second image having resolution that is different than that of the first image may be produced from at least a second portion of the image signal. [A1864]

"Metal detector, in particular mine detector"

A mine detector has a search head with a transmitting unit for the transmission of signal sequences into the ground, and a metal detection unit. A distance measurement sensor is arranged on the search head for determination of the current geometric distance of the search head from the ground. The response signal sensor and the distance measurement sensor are each connected for dataflow purposes to a measurement data logic unit which can be supplied with ground distance measurement data when the distance between the search head and the ground surface changes, in order to produce a distance/signal strength curve. The measurement data logic unit is connected for data interchange purposes to a curve comparison unit, which is itself connected for data interchange purposes to a standard curve and algorithm storage unit and can be supplied from there with the standard distance/signal strength curves and algorithms. Further, the parameter information which is associated with the signal strength curve selected from the standard curve storage unit can be emitted from the curve comparison unit via a categorization unit to a display unit on the mine detector. [A1865]

"Unique space time adaptive system (USS)"

A method of detecting radar returns and measuring their parameters with or without clutter present and no clutter cancellation employed which includes transmitting at least one pulse, processing the returns surpassing a threshold detected in one range azimuth bin and by processing and separating out the returns based on their different range and azimuth. Another method includes transmission of many pulses and has minimum of one channel return surpassing detected threshold, which is detected in one range Doppler bin. The method also includes processing and thereby separating out the returns based on their different radial velocity and or azimuth and comparing the returns to a database of expected returns and adaptively processing returns that do not correspond to the expected returns. The method identifies the non-corresponding returns as indicative of at least one of clutter, land sea interface, clutter discretes and antenna sidelobe returns each without utilizing clutter cancellation. [A1866]

"Antenna with integral sealing member for a radar-based level measurement system"

An antenna assembly suitable for use with a microwave-based level measurement system mounted on a vessel. The antenna assembly comprises a rod antenna having a mounting member with an integral sealing ring. The antenna is molded from a conductive polymer such as PTFE. The sealing ring is also formed from the same polymer as the antenna. The sealing ring may be formed as an integral component of the mounting member molded from a polymer material or as a separate ring element which is welded or otherwise affixed to the mounting member. The antenna assembly is coupled to the level measurement apparatus using a clamping mechanism. As the clamping mechanism is secured to the mounting member, the sealing ring is compressed and deflected and in the compressed state provides a seal between the level measurement apparatus and the section of antenna extending into the vessel. According to another embodiment, the antenna assembly is adapted for and mounted in a horn antenna. The horn antenna is coupled to the level measurement system and extends into the vessel. [A1867]

"Vehicle control apparatus"

A vehicle control apparatus includes an obstruction detection unit for measuring a headway distance until an obstruction existing ahead of the vehicle by means of a radar device, a unit for performing vehicle control or alarm control on the basis of the headway distance, a unit for detecting detection performance of the obstruction detection means in a vehicle in which the obstruction detection unit is used to perform two or more controls containing the vehicle control or alarm control, and a unit for controlling to stop operation of the vehicle control or alarm control in accordance with the detection performance individually. [A1868]

"Vehicle driving control device"

A vehicle driving control device is configured to improve response to driver braking operation and shorten the free running distance. The vehicle driving control device processes an image showing an area ahead of the host vehicle to recognize a preceding vehicle in the host vehicle lane, and then determines whether or not the preceding vehicle is making a sudden lateral movement based on this image processing result. If the vehicle driving control device determines that the preceding vehicle is making a sudden lateral movement, then a preliminary braking force is generated. [A1869]

"System and method for radiating RF waveforms using discontinues associated with a utility transmission line"

A method for processing radio frequency reflections is provided. The method applies an RF waveform to a transmission line that is a conductor used for providing a utility service. The method uses a RF waveform generator to transmit UltraWideband (UWB) RF waveforms through the conductors of a building. The RF waveforms are emitted at emission points that can be impedance discontinuities along the transmission line or impulse radios. The emitted RF waveforms reflect off of objects in the building and are received at reception points that can be impedance discontinuities or impulse radios. These reflections are processed to determine movement of objects within or near the building. Based on the reflections of the RF waveforms, the position of the objects within or near the building can be determined. [A1870]

"Network-based method and system for determining a location of user equipment in CDMA networks"

A method and system for determining a location of a user equipment using RTT measurements from a connected node B and RTT measurement of other node Bs which are not connected to the user equipment. The radio network controller of a network measures RTT of a connected node Bs and then measures RTT of non connected node Bs. Based on the RTT measurement, the distances of the user equipment from each node B is determined.

Circles having radii equal to the distances of the user equipment from the nodes are used to determine the user equipment location. [A1871]

"Process and device for estimating the speed of movement of a mobile terminal of a wireless communication system"

Estimating the speed of movement of a mobile terminal includes estimating the impulse response of the transmission channel at a given instant, and estimating the time derivative of the estimated impulse response. Estimating the speed also includes determining of a ratio of the energy of the estimated impulse response to the energy of the estimated time derivative. [A1872]

"Three-dimensional surface/contour processing based on electromagnetic radiation interrogation"

One embodiment of the present invention includes scanning a target with electromagnetic radiation including one or more frequencies in a range of about 200 MHz to about 1 THz, establishing a point cloud representation of the surface of the target from the scan, and performing one or more curve-fitting operations as a function of at least a portion of the points of the point cloud representation to represent at least a portion of the surface of the target. [A1873]

"Method for parking a vehicle"

A method for parking a vehicle in which distances of the vehicle from obstacles as well as the length and/or width of a parking space are determined. Sensors are used for parking space determination as well as distance measurement in this context. [A1874]

"Method for determining the distance between two transmitting and receiving stations"

In a method for determining the distance between two transmitting and receiving stations, a transmission signal is generated in each station and is transmitted as a series of microwave pulses having a predefined pulse repetition frequency to the other respective station. The coincidence of pulses of the transmission signal sent by the respective station and the signal received by the station is detected in each station as a coincidence event, and the number of pulses transmitted and received by the respective station at the time of the coincidence event is determined. The distance between the stations is then calculated on the basis of the number of the determined pulses. [A1875]

"Apparatus for automatically pointing a device at a target"

A system for pointing a device at a given target has a sensor for sensing a number of positional information points of the target with the sensor relaying the positional information points to a controller. The controller is for computing a directional control information based on the relayed positional information points. The system also has an adjustment device for moving the device in a direction that bears a predetermined relationship to the target in response to the computed direction control information. The target moves and the sensor senses the positional information of the target and the sensor relays the positional information to the controller with the controller computing the directional control information to control the adjustment device. The adjustment device points the device at the target. [A1876]

"Directed sequential hazard assessment weather radar"

A directed sequential hazard assessment weather radar system detects weather and hazards with low latency and high confidence in a hazard detection mode to detect a region of reflectivity and changes to an assessment mode after detecting the region of reflectivity. The weather radar system scans a volume in front of an aircraft to detect the region of reflectivity in the hazard detection mode using a multiscan process and a reflectivity pulse pattern. The weather radar system determines presence of a hazard in the region of reflectivity after detecting the region. The weather radar system changes to a turbulence pulse pattern in the assessment mode and scans the region of reflectivity with an auxiliary sweep to determine turbulence. The directed sequential hazard assessment weather radar system performs a qualification process by scheduling an additional radar scanning auxiliary sweep to determine if the turbulence is real. [A1877]

"Method and apparatus for minimizing the number of power amplifiers required under multiple transmission conditions"

The number of power amplifiers required to amplify a plurality of transmission signals is reduced by using non-linear transmission lines (NTL) circuits. In general, a "combining" NTL circuit is used to combine the plurality of transmission signals to form a soliton pulse. The soliton pulse is then amplified such that each of its component transmission signals are amplified. A "dividing" NTL circuit is then used to divide the amplified soliton pulse into its component amplified transmission signals. The amplified transmission signals can therefore be transmitted over a communications channel without requiring a separate power amplifier for each. [A1878]

"Method for evaluating and controlling a radar installation"

A method is disclosed for evaluating the terrain surrounding a radar site. The method comprises to calculate the radar horizon around a radar site from stored terrain elevation information. The information obtained can be used for controlling the scanning profile of the radar, by letting the radar scan above the calculated horizon, and thus avoiding transmitting into the terrain. [A1879]

"System for enhanced detection of a target"

Disclosed herein is a computer-readable medium having stored thereon computer-executable instructions for providing phase-range data associated with a return pulse of a radar device and second phase-range data associated with a successive return pulse of the radar device. The computer-executable instructions are preferably also for comparing the phase-range data and the second phase-range data to obtain a difference, and for differentiating the difference. In some embodiments of the invention, the computer-executable instructions are preferably also for discriminating a target from clutter by using the differentiated difference to identify coordinates satisfying a velocity threshold associated with the clutter. Embodiments of the invention preferably enable phase-coherent operation of a non-coherent radar device by processing backscattered clutter return, and in some aspects, do so using clutter distributed in range as a reference. Related systems, methods, devices, and other embodiments are also disclosed herein. [A1880]

"Pattern classifier and method for associating tracks from different sensors"

An interceptor-based sensor clusters tracks of objects to generate track clusters based on an uncertainty associated with each track, and generates feature vectors for a cluster under test using the relative placement and the population of other track clusters. The feature vectors may include one or more of a cluster count feature vector (N) , a cluster population density feature vector (P) , a cluster proximity feature vector (r) , a cluster-weighted centroid feature vector (L) and a cluster scattering feature vector (.theta.) . The interceptor-based sensor generates belief functions (.mu.) from corresponding feature vectors of clusters of tracks generated from a ground-based sensor and the interceptor-based sensor. The interceptor-based sensor may also associate the tracks with a cluster having a track of interest identified by a ground-based sensor based on the belief functions and may select one of the tracks for intercept of a corresponding object within the threat object cloud. [A1881]

"Ultra-wideband detector systems for detecting moisture in building walls"

A non-destructive detection method and system enables detecting a moisture patch located inside a building wall or the like. A transmitter generates a series of ultra-wideband pulses while an ultra-wideband antenna unit, preferably in the form of an antenna array including a plurality of switchable antenna pairs, directs the pulses toward the building structure so that the pulses are reflected therefrom, and receives the reflected pulses. A receiver processes the reflected pulses received by the antenna unit and produces a corresponding output. A controller controls the operation of the transmitter, receiver and antenna unit, and analyzes the output of the receiver for the presence of moisture inside of the building wall. [A1882]

"Radar fill-level sensing device"

A radar fill-level sensing device has a high-frequency unit that serves to generate and process radar signals of a predefined frequency and wavelength, an antenna for transmitting and/or receiving the radar signals, as well as circuitry, provided on a circuit board. That circuitry includes a microstrip circuit for connecting the high-frequency unit to the antenna, that microstrip circuit featuring a ground conductor. The ground conductor encompasses a first segment, a radial stub and a second segment, the length of the first segment corresponding essentially to one quarter of the predefined wavelength. The radial stub is positioned at the end of the first segment, the second segment connects to the end of the first segment and to the radial stub, and the second segment is grounded. Based on this design, a radar fill-level sensing device is obtained that can easily and reproducibly be implemented within the requirements of "intrinsically safe" ignition protection. [A1883]

"Vehicular traffic surveillance doppler radar system"

A vehicular traffic surveillance Doppler radar system and method for use of the same are disclosed. In one embodiment, the system comprises a modulation circuit portion for generating modulated FM signals. An antenna circuit portion transmits the modulated FM signals to a target and receives the reflected modulated FM signals therefrom. A ranging circuit portion performs a quadrature demodulation on the reflected modulated FM signals and determines a range measurement based upon phase angle measurements derived therefrom. [A1884]

"Preceding-vehicle detecting apparatus, own-vehicle controlling apparatus, and preceding-vehicle detecting method"

To provide a preceding-vehicle detecting apparatus, own-vehicle controlling apparatus and preceding-vehicle detecting method capable of detecting a preceding vehicle in a more reliable manner, a preceding-vehicle detecting apparatus (1) comprises: a millimeter wave radar (11) , a measuring-target-point-group generating part (131) setting measuring-target points based on reflected waves, and single-connecting those measuring-target points having the same relative velocities to thereby generate measuring-target point groups, respectively, a group-relative-velocity determining part (132) extracting those measuring-target point groups which meets conditions for preceding vehicle, respectively, and a temporal continuity judging part (133) regarding those measuring-target point groups as preceding vehicles, each of which has a number of detected times equal to or larger than a prescribed value (N1) . [A1885]

"Identification and location system for personnel and vehicles"

A surveillance system is provided for surveillance of objects within a secure area. A surveillance sensor transmits surveillance signals to all objects within the secure area, the reflections of which are received back by the surveillance sensor to determine the locations of objects, and communicates the determined locations to a pressing facility. Objects authorized to be in the secure area are equipped with an Identification Friend or Foe (IFF) unit that includes a GPS receiver and a data communication transmitter. In response to predetermined conditions, the IFF units broadcast their position and identification to the processing facility for correlation with locations defined by the reflection signals. The reflection signals from other objects are compared with a list of the locations of objects, such as terrain features and man-made facilities, that are known to be in the secure area If no broadcast information is received from an object and the location of that object determined by the reflection signal cannot be correlated with the known object list, than the object has no proper authorization to be within the secure area, and an alarm is generated. [A1886]

"Electric wave axis adjusting apparatus for radar mounted on vehicle"

The present invention provides an electric wave axis adjusting apparatus for an on-vehicle radar capable of readily and precisely adjusting an electric wave axis only by making the scanning range and a detection range identical to each other and changing a scanning range, and of adjusting the electric wave axis of an on-vehicle radar without wasting time in order to detect a reflector. In the electric wave axis adjusting apparatus for an on-vehicle radar of the present invention, an on-vehicle radar includes: a radar portion for generating the electric wave, a scanning unit for changing a transmission/reception direction of the electric wave to form within a scanning range, along with having an antenna for transmitting/receiving the electric wave, a signal processing unit for calculating a direction of the reflector based on amplitude of the reflected electric wave, and a scanning range changing unit for changing the angle of the scanning range to an axis side of the vehicle based on the direction of the reflector calculated by the signal processing means to align an electric wave axis of the on-vehicle radar with the axis. [A1887]

"System and method for detection and tracking of targets"

System and method for detection and tracking of targets, which in a preferred embodiment is based on the use of fractional Fourier transformation of time-domain signals to compute projections of the auto and cross ambiguity functions along arbitrary line segments. The efficient computational algorithms of the preferred embodiment are used to detect the position and estimate the velocity of signals, such as those encountered by active or passive sensor systems. Various applications of the proposed algorithm in the analysis of time-frequency domain signals are also disclosed. [A1888]

"Method and device for boresighting an antenna on a moving platform using a moving target"

A technique for boresighting an antenna mounted on a moving platform is described. The technique uses a concurrently moving calibration target. Target navigation data and platform navigation data are used to compensate for movement of the target and the platform. The antenna pointing direction is biased in a direction which provides a best signal quality, and the bias used to determine antenna boresight calibration factors. The boresight correction factors can be used for open loop pointing. [A1889]

"Reducing antenna boresight error"

Reducing antenna boresight error includes receiving radar pulses reflected from the ground, where pulses are emitted from the antenna of a radar system, reflected by the ground, and received by the antenna. The return pulses carry information about the ground. Measurement indices are established from radar and platform parameters, and a clutter spectrum is generated from the return pulse information. The amplitude of the clutter spectrum is measured at each of the measurement indices. Whether there is an amplitude imbalance is established in accordance with the measured amplitudes. An error estimate describing an antenna boresight error is determined if there is an amplitude imbalance. [A1890]

"System and method for determining patrol speed"

A system for processing vehicle speed data for a vehicle is provided. The system includes a front antenna assembly of the vehicle generating a front digital signal, and a rear antenna assembly of the vehicle generating a rear digital signal. A fast Fourier transform system converts the front digital signal into front frequency shift data and the rear digital signal into rear frequency shift data. A patrol speed system matches the front frequency shift data and the rear frequency shift data and generates a vehicle speed for the vehicle. [A1891]

"System of subterranean anomaly detection and repair using infrared thermography and ground

penetrating radar"

Method and system to identify, verify and remediate subterranean anomalies. Infrared (IR) thermographic scanning [10] of a selected surface area obtains image area data [12, 14] inferring such an anomaly. Ground penetrating radar (GPR) is used [22] at predetermined surface locations penetrates subterraneously to a depth including the anomaly, creating vertical dimension radar data [120] showing anomaly depth. Surface image IR data is correlated with GPR data to verify the anomaly and its vertical dimension and finds [124] a central location in the anomaly. Anomaly volume is predetermined from the area data and vertical-dimension data. Grout injected [26, 124] into the central location at first pressure secures the anomaly by surrounding the central location. After verifying centrally securement, more grout is injected [32, 126] into the anomaly region at second pressure at least as great as the first pressure until the total grout injected approximates the predetermined anomaly volume. [A1892]

"Electromagnetic wave absorber, method of manufacturing the same and appliance using the same"

An electromagnetic wave absorber for use in the high frequency range above 1 Ghz and a composite member are characterized by the fact that magnetic metal grains are covered with ceramic above 20 volume %. Further, a method of manufacturing the electromagnetic absorber and the composite member is characterized by the fact that composite magnetic particles, in which a plurality of magnetic metal grains and ceramic are unified, are formed through a mechanical alloying method applied to a composite powder composed of magnetic metal powder and ceramic powder. The electromagnetic wave absorber can be used in a semiconductor device, an optical sending module, an optical receiving module, an optical sending and receiving module, an automatic tollgate in which erroneous operation due to electromagnetic wave disturbance is provided by use of the electromagnetic wave absorber. [A1893]

"Millimeter-wave active imaging system with fixed array"

Active millimeter-wave imaging systems can include an antenna apparatus configured to transmit toward and receive from a subject in a subject position, electromagnetic radiation. A controller can include a transceiver configured to operate the antenna apparatus and produce an output representative of the received radiation, and a processor adapted to convert the transceiver output into image data representative of an image of the subject. The antenna apparatus may move in a partial or continuous loop around the subject, toward or away from the subject, or in an opposite direction to an associated antenna apparatus. Antenna units in the antenna apparatus may be oriented at different angular positions along an array. Antenna arrays may also be formed of a plurality of array segments, and a group of arrays may be combined to form an antenna apparatus. [A1894]

"Method for selecting a target vehicle"

A method selects a target vehicle located in front of a vehicle in the driving direction of the second-mentioned vehicle. The selection of the target vehicle is used in particular to automatically control the distance between the second-mentioned vehicle and the target vehicle. A preceding vehicle that can be selected as a target vehicle is recognized if a sensor unit has detected an object in front of the vehicle in the driving direction and a selection condition for this object is satisfied. Whether the selection condition is satisfied depends on the result of an evaluation of dynamic parameters of the vehicle and/or the object. The presence of a selectable preceding vehicle is indicated to the driver, and the driver can select the selectable preceding vehicle as a target vehicle by a confirmation. [A1895]

"Method and device for determining the filling level of a medium in a container"

The invention relates to a method for determining the filling level of a medium in a container. A mixer that has at least one mixer blade and a mixer frequency (f.sub.< 1>,R< /1>,) is disposed in the container. Measuring signals are emitted at a predetermined measuring frequency (f.sub.< 1>,M< /1>,) towards the medium. The measuring signals reflected on the surface of the medium are received and evaluated by a run time method. The aim of the invention is to provide a device which allows for a reliable measurement of the filling level of a medium in a container provided with a mixer. To this end, the measuring frequency (f.sub.< 1>,M< /1>,) of the measuring signal having the mixer frequency (f.sub.< 1>,R< /1>,) of the mixer is synchronized (f.sub.< 1>,M< /1>,=n f.sub.< 1>,R< /1>,with n .epsilon. N) and that the measuring frequency (f.sub.< 1>,M< /1>,) is shifted by a defined phase (?) with respect to the mixer frequency (f.sub.< 1>,R< /1>,) . [A1896]

"Hostile platform position location utilizing networked communications"

The communication system utilizes transmitters that provide communication transmissions having deterministic data. Receivers of the system have the digital processing capability for correlating received transmission reflections of the deterministic data amongst the receivers, the reflections of the deterministic data being from objects within the transmission range of a respective transmitter. The correlating includes utilizing relatively weak multipath signals of the transmission reflections and the superimposition of external data therewith to provide a resulting data base of range reflections. The range reflections are provided to others of said plurality of receivers for processing to derive the environment and the locations and movements of objects without the use of a specific interrogation signal, thereby providing situational awareness. [A1897]

"Method for determining the distance between a base station and a mobile object, in addition to a base station and identification system for a method of this type"

A method for determining the distance between a base station (SLG) and a mobile object (DT1 DT3) . A HF carrier frequency and an offset frequency (df) are predetermined for a QAM modulation. The HF carrier frequency is increased and decreased by the offset frequency in sequence over time in such a way that the HF carrier base frequencies (fo+df, fo-df) resulting in an HF carrier signal (TS) thus modulated exhibit an identical phase when the frequency is changed. The HF carrier signal is subsequently transmitted and simultaneously mixed (MIX) with an HF carrier signal (RS) that has been backscattered by the mobile object to obtain a carrier phase signal (PS) . The corresponding carrier phase (PH1, PH2) for the two HF carrier base frequencies is determined in sequence over time. The difference (dPH) between these phases is used to calculate the distance between the base station and the respective mobile object. [A1898]

"Radar system and vehicle controller incorporating radar system"

An electromagnetic wave is transmitted from a signal transmission antenna using a signal transmission IC, this electromagnetic wave is received, after having been reflected by a target object, by signal receiving antennas and signal receiving ICs, and the distance to the target object or the azimuth of the target object is detected by a signal processing section. The signal receiving antennas have approximately the same signal receiving characteristics and directivity in approximately the same direction, and are arranged in a row with a predetermined gap between them, thus constituting an antenna array. The levels of the signals received by these signal receiving antennas are detected by a received signal level detection means, and an external objects adhesion detection means decides that some external objects are adhered to the front surface of the signal receiving antennas, if the dispersion, or the level difference, between the levels of these signals received from the antennas is greater than a predetermined value. [A1899]

"Technique for low grazing angle 3D SAR target recognition"

A radar on a moving platform for three dimensional target recognition of a target on a flat or sloping terrain is described. The target is illuminated from a plurality of locations to generate images at many aspect angles. The radar is positioned at a low grazing angle with respect to the target for generating a shadow of the target on the flat or sloping terrain for each aspect angle of the plurality of aspect angles. The radar comprises an analog to digital converter for converting reflections from the target induced by radar illumination into target digital data and for converting reflections induced by the illumination from the flat or sloping terrain into terrain digital data. The radar further comprises a computer for extracting radar images of the target and its shadow (s) at the plurality of aspect angles at low grazing angles, computing the slope of the terrain from the terrain digital data, correlating a plurality of the radar images to compute a three dimensional image of the target from the shadow of the target upon the flat or sloping terrain, and classifying the three dimensional image for target recognition using a target recognition algorithm. [A1900]

"Multi-source surveillance system"

A surveillance system can include a first sensor apparatus configured to interrogate a subject, including a person and objects carried by the person, with millimeter-wave electromagnetic radiation for imaging the subject. A supplemental source provides additional information about the subject that is relatable to objects potentially carried by the person. Relational information relates the produced image signal and the subject information. The supplemental source may be a second sensor apparatus adapted to detect a given characteristic of an object potentially carried by a person in the subject position. Relational information about whether the person is carrying an object having the given characteristic may then be produced. [A1901]

"Method and apparatus for processing a signal received by an electromagnetic prober"

An electromagnetic prober comprising a transmission antenna, a reception antenna, a reception signal processing section for generating an analytic signal on the basis of a detection signal of the reception antenna, and an analytic processing section for performing a predefined analytic process on the basis of the analytic signal, wherein the analytic processing section divides the analytic signal into a plurality of time-based ranges and performs a predefined computation on average cycle periods in the respective time-based ranges of the analytic signal to calculate average dielectric constants in depth ranges of the medium corresponding to the respective time-based ranges. [A1902]

"Fast acting active protection system"

A fast acting active protection system for military vehicles defeats RPG (rocket propelled grenade) threats fired from close ranges. The system minimizes the hazard to troops and civilians nearby. The system uses a plurality of passive sensors to locate the threat and initialize the system. A low cost radar or laser tracker is used as the means to determine range, velocity, and (if required) angular position of the threat. The countermunition used may be one of several choices, with the requisites being that the countermunition provides fast response with low inertia, and is able to damage or destroy the detected threat. A multi-barrel recoilless gun is the weapon of choice. A launching device is used to deploy and aim the countermunition and the tracking means. On board software and electronics are used to control the system. [A1903]

"Surveilled subject privacy imaging"

An imaging system can include an antenna apparatus configured to transmit toward and receive from a subject in a subject position, millimeter-wave electromagnetic radiation. A subject may include a person and any object or objects with the person. A controller can include a transceiver configured to operate the antenna apparatus and produce an output representative of the received radiation, and a processor adapted to produce from the transceiver output, image data representative of an image of the subject. At least a first portion of an image signal representative of radiation received by an antenna apparatus may be used to produce first image data representative of a first image of at least a portion of the subject. Second image data representative of a second image having resolution that is different than that of the first image may be produced from at least a second portion of the image signal. [A1904]

"Real-time multistatic radar signal processing system and method"

A real-time signal processing engine robustly detects, localizes, tracks and classifies ground targets based on radar signals from a multistatic radar system. The system differentiates between different targets based on an optimized cost function, which can include the total returned normalized pulse energy. The local transmitters/receivers can communicate with each other via the transmitted radar signals. [A1905]

"Apparatus for estimating direction of arrival of signal"

An apparatus for estimating direction of arrival of signal is provided that has excellent performance in terms of angular resolution and the number of signals that can be identified. In an array sensor comprising a plurality of sensor elements, the two outermost sensor elements are alternately selected by a switch for use as a transmitting sensor, and the other sensor elements are selected in time division fashion as receiving sensors. With this arrangement, the effective aperture is increased to about twice the physical aperture, to improve angular resolution in a direction-of-arrival estimator. [A1906]

"System and method for highly directional electronic identification and communication and combat identification system employing the same"

An antenna for directional electronic communication, a directional communication system, a method of conducting directional communication, a combat identification system and a method of identifying friendly forces. In one embodiment, the antenna includes: (1) a conductive shield having an opening at an end thereof and a radio frequency absorptive material located on an inner surface thereof, (2) a Luneberg lens located within the conductive shield and (3) a feed horn located proximate a portion of the Luneberg lens that is distal from the opening. [A1907]

"Vehicle positioning and tracking radar system"

A vehicle positioning and tracking radar system includes a rotating antenna with a pair of spatially separated transmit feeds for simultaneously transmitting a pair of frequency-modulated continuous-wave (FMCW) electromagnetic signals having a first polarisation and a pair of spatially separated receive feeds for receiving an electromagnetic signal having a second polarisation, wherein the first and second polarisations are different from one another, such that the transmit feed and receive feed at the rotating antenna are isolated from each other, and a coded modulated transponder receives transmit signals from the rotating antenna with the first polarization and transmits a receive signal to the rotating antenna with the second polarization. [A1908]

"Radar-assisted sensing of the position and/or movement of the body or inside the body of living beings"

The present invention relates to a method for sensing information about the position and/or movements of the body of a living being or a part of the body inside the body, in particular for use in a motor vehicle. The method includes the steps: Send (18) an electromagnetic signal (15) that includes, according to the invention, frequencies in the radar range, to a predetermined area of the body of a living being, Receive (20) an electromagnetic signal (22) reflected from the area of the body, Evaluate (30) the captured receive signal (22) with regard for the difference in delay time and/or frequency relative to the transmit signal (15) to determine the information. With the method according to the present invention, the breathing and heart rate and the position of the body of a driver of a motor vehicle can be monitored in contactless fashion during the drive. [A1909]

"Method and system for detecting with radar the passage by a vehicle of a point for monitoring on a road"

The invention relates to a method for detecting the passage by a vehicle of a determined point for monitoring on a road, wherein from a remotely situated location a radar beam is transmitted continuously to the point for monitoring, reflections from the transmitted radar beam are received at the remotely situated location, and it is determined from the received reflections that the vehicle is passing the point for monitoring. The radar beam can herein be transmitted at an acute angle to the travel direction of the passing vehicle. The detection can be used to activate a red-light camera, to measure the speed of the vehicle or measure the traffic intensity, without sensors, for instance induction loops, having to be arranged in the road for this purpose. [A1910]

"Sub-surface radar imaging"

Detailed is radar imaging apparatus including a single transmit antenna and at least one receive antenna, scanning apparatus (e.g. a pantograph) for mechanically scanning the antennas over a surface of interest, position providing apparatus (e.g. a computer driving the pantograph via an X-Y drive and a stepper motor) providing a position signal indicative of the instantaneous position of the transceiver and a control system for operating the transmit antenna in a stepped frequency continuous wave mode. The amplitude and phase components of the receive antenna signal are analysed and the output combined with the position signal as in a synthetic aperture array to provide a radar image signal of the surface and underlying features. The scan is two-dimensional (random or boustrophedral) . [A1911]

"Collision-prediction unit for a vehicle"

A collision-prediction unit for a vehicle including a road condition detector, a maximum deceleration estimator, a forward vehicle detector, a forward vehicle deceleration calculator, and a collision examiner is provided. The road surface detector detects a condition of a road surface on which the vehicle travels. The maximum deceleration estimator calculates a maximum vehicle deceleration for the vehicle on the road surface having the detected condition. The forward vehicle detector detects a moving condition of a forward vehicle located ahead of the vehicle. The forward vehicle deceleration calculator calculates a forward vehicle deceleration based on the moving condition of the forward vehicle. The collision examiner determines whether a collision between the vehicle and the forward vehicle is imminent by comparing the forward vehicle deceleration to the maximum vehicle deceleration of the vehicle. [A1912]

"Multi-sensor surveillance portal"

A surveillance system can include a first sensor apparatus configured to interrogate a subject, including a person and objects carried by the person, with millimeter-wave electromagnetic radiation for imaging the subject. A supplemental source provides additional information about the subject that is relatable to objects potentially carried by the person. Relational information relates the produced image signal and the subject information. The supplemental source may be a second sensor apparatus adapted to detect a given characteristic of an object potentially carried by a person in the subject position. Relational information about whether the person is carrying an object having the given characteristic may then be produced. [A1913]

"Image processing system for mounting to a vehicle"

An image processing system to be mounted to a vehicle includes a radar adapted to measure distance and direction to an object based on reflected electromagnetic waves which are outputted to scan the exterior of the vehicle, an image-taking device such as a camera for obtaining an image, and an image processor for carrying out image processing on a specified image processing area in an image obtained by the image-taking device. The image processor is adapted to determine a center position of the image processing area according to a measurement point of an object detected by the radar and the size of the image processing area according to a beam profile of electromagnetic waves outputted from the radar. [A1914]

"Microwave sensor"

In one embodiment of a microwave sensor, when a "low" plants countermeasure is conducted, if an alert has been generated 5 times or more within 1 minute, an object decision move distance is changed to be longer and a "high" plants countermeasure is conducted. Subsequently, when assuming that the plants countermeasure is "low", only if the alert is not generated within 10 minutes, the plants countermeasure is returned to "low". Further, if the alert is not generated within 10 minutes in the status of the "low" plants countermeasure, the plants countermeasure is canceled. [A1915]

"Process for tracking vehicles"

The invention is process for tracking a moving targeted vehicle from a remote sensor platform comprising the steps of 1) tracking the targeted vehicle and periodically recording its radar signature until its identity becomes ambiguous, 2) tracking the target after it has left its ambiguous state and periodically recording its radar signature, and 3) comparing the recorded radar signatures prior to the targeted vehicle becoming ambiguous to the recorded radar signature taken after the targeted vehicle has left its ambiguous state and determining that the targeted vehicle now tracked is the same as the targeted vehicle being tracked prior to becoming ambiguous. [A1916]

"Data acquisition for a ground penetrating radar system"

A system and method for measuring ground penetrating radar data is described which includes controlling the timing for generating stimulus electromagnetic waves and the sampling rate of reflected electromagnetic waves in response to the stimulus electromagnetic waves. Generally, the timing is adjusted for spatially over-sampling the ground penetrating radar data. The speed of the system can also be adjusted based on the measured data. [A1917]

"On-vehicle radar system"

An on-vehicle radar system capable of detecting a range error from range data based on an echo from a target (6) . Range error is detected when amplitudes of beat frequency components in two adjacent range gates are substantially equal. The system includes a transmitting unit (1, 2, 4, 5) for radiating a modulated wave having frequency increasing and decreasing repetitively after pulse modulation, a receiving unit (8, 9, 10, 11, 12) for receiving the echo, and an arithmetic unit (13) for detecting a range error ascribable to aberration of modulation band width due to frequency increase and decrease of transmission wave (W1) by comparing a range corresponding to the range gate with that determined from a frequency difference between transmission wave and echo. The arithmetic unit (13) detects the range error on the basis of frequency difference components having substantially same amplitudes in adjacent range gates. [A1918]

"Broadband radar and modulator, in particular for microwave switching over a very short period"

The present invention relates to an ultrawideband radar. It also relates to a modulator, in particular for switching microwaves over a very short duration. The radar includes a modulator modulating a carrier microwave, this modulator including a microwave mixer means for generating a modulation signal. The microwave enters on one input of the mixer and the modulation signal on the other input of the mixer, the output signal from the mixer being provided to the transmission means of the radar. Advantageously, the modulation signal may be pulsed and of very short duration. A local oscillator, operating as a free oscillator, provides the microwave to be modulated. The invention applies in particular in respect of aiding the parking of motor vehicles. More generally, it applies in respect of all applications which require low-cost high distance resolution radar detection. [A1919]

"Vehicular radar device"

A vehicular radar device capable of accurately detecting rain or the like or a road surface by discriminating between the rain or the like or the road surface and others. The vehicular radar device has a control circuit which performs a detection operation in an up state in which the visual field of the radar is shifted comparatively upwardly in the vertical direction so that the road surface is not detected, and determines that, from among detection data obtained during the up state, detection data which does not vary in reception intensity nor in reception delay time (distance data) for a predefined time is detection data relative to rain or the like. [A1920]

"Method and apparatus for correcting velocity-induced range estimate phase errors in a two-tone monopulse CW radar"

A method and apparatus is provided for correcting the phase difference estimate derived from a two-tone CW radar to correct velocity-induced range estimate phase errors by offsetting the phase difference estimate with a phase correction equal to either of the Doppler frequencies associated with returns from an object multiplied by the time interval between the samplings of the returned waveforms. The correction effectively eliminates the velocity-induced slippage between the phases of the retuned waveforms so that a comparison between the phases of the waveforms can be made to reduce or substantially eliminate range estimate bias. [A1921]

"Vehicle radar apparatus"

A radar apparatus for a vehicle radiates laser beams and integrates a plurality of received signals corresponding to the same plurality of successively radiated laser beams. Thus, the sensitivity to detect a beam-reflecting body is improved. Further, a sampling start timing of the received signals is delayed as a delay time relative to a radiation timing of the laser beam corresponding to the received signal. By changing the delay time, beam-reflecting bodies throughout all detection distances can be detected even when the number of sampling points is made smaller than the number of sampling points required to cover all the detection distances in order to reduce the integration processing load. [A1922]

"Radar rainfall estimation technique when attenuation is negligible"

A method of using a bipolar radar to estimate a precipitation rate for rain that generates negligible attenuation. The method includes using the bipolar radar to measure the differential phase .PHI..sub.DP and the apparent reflectivity Z.sub.e on at least one of horizontal polarization H and vertical polarization V over a given interval [r.sub.0, r.sub.1] of path radii relative to the radar. An estimate of the value N.sub.o* representative of the dimensional distribution of rain drops is made on the basis of the differential phase difference in the range r.sub.0 to r.sub.1 and on the basis of an integral of a function of the apparent reflectivity Z.sub.e along the interval [r.sub.0, r.sub.1]. A value is deduced for the precipitation rate at a point from N.sub.0* and the apparent reflectivity at the point. [A1923]

"Doppler tracking optical monopulse"

A method and apparatus for finding a relative direction to, a radial speed of, and a distance to a target is described. A laser source illuminates the target and the Doppler shifted return beam is incident upon a window system at an angle and is transmitted therethrough. The magnitude of the transmitted Doppler shifted beam decreases due to Fresnel transmittance. Opposing photomixers then detect this transmitted Doppler shifted beam, thereby creating a pair of detection signals that are mixed with a local oscillator signal. The mixing process creates Doppler frequency signals that are subsequently processed to determine the radial speed of the target. Due to the Doppler frequency component of the signals, objects in the same direction, but moving at different radial speeds, can be discriminated, as the relative direction processing occurs after the Doppler processing. [A1924]

"Method and device for the detection and track of targets in high clutter"

A method for discriminating and tracking a target in a clutter cloud includes transmitting a radar signal at a signal bandwidth to: identify a range extent of a clutter cloud, determine a centroid and a velocity growth rate of the clutter cloud, and identify a direction of movement of the centroid of the clutter cloud. The method may also include locking a another radar signal having a greater signal bandwidth onto the centroid of the clutter cloud whereby the centroid is tracked within one radar range resolution bin, providing a delay line that includes at least two Doppler filters and is configured to cover a Doppler frequency range corresponding to a velocity growth rate of the clutter cloud, and processing a reflected radar signal corresponding to the greater signal bandwidth. The processing of the reflected radar signal may comprise passing the reflected radar signal through the delay line to mitigate a portion of the reflected signal that is reflected by the clutter cloud. A system and apparatus for performing the method is also provided. [A1925]

"Radar sensor for motor vehicles"

Radar sensor for motor vehicles, having a transmitter and receiver unit whose directional characteristic has multiple lobes, at least one of which is directed parallel to the roadway surface, at least one other lobe being directed obliquely to the roadway surface. [A1926]

"Method for attaching radar for vehicle, radar for vehicle, and monitoring method"

An attachment method attaches a bracket to a vehicle, and attaches a radar to the bracket so that an axis of a directivity pattern of an antenna directs upward with respect to a horizontal direction. The antenna of the radar has an asymmetric vertical directivity pattern with respect to the axis of the directivity pattern. [A1927]

"Depth-based surveillance image reconstruction"

A subject may be interrogated with electromagnetic radiation for producing image data representative of an image of the subject. First and second image data, produced based on reflectivity in first and second frequency ranges, may be related. In some examples, image data for one picture element may be produced based at least in part on reflectivity of the radiation at a depth selected based at least in part on a depth of another picture element. In some examples, plural images may be produced based on reflectivity at different depths. In some examples, a value of reflectivity may be determined for an intermediate depth between two adjacent depths of image data based at least in part on reflectivity of the radiation for a plurality of spaced-apart depths. [A1928]

"Surface wave radar"

A surface wave radar system including a receive antenna array (20, 22) for generating receive signals, and a data processing system (24) for processing received data representing the receive signals to mitigate ionospheric clutter. The received data is range and Doppler processed, and a spatial adaptive filter (52) is trained using training data selected from the processed data. The training data includes ionospheric clutter data and excludes cells which contain target data and substantial sea clutter. The processed data is filtered using the filter (52) , which may be based on loaded sample matrix inversion. The antenna array (20,22) may be two-dimensional having an L or T shape. [A1929]

"Method of triggering the transmission of data from a mobile asset"

A navigation system that uses a method for transmitting the location of a vehicle to a location remote from the vehicle is provided. The method includes determining a location of the vehicle relative to a road network defined as a first location, and determining a change in the location of the vehicle relative to the road network defined as a second location. The first location may be a first street while the second location is a second street different that the first street. The navigation system then communicates the location of the vehicle to the remote location when vehicle reaches the second location. In another aspect of the present invention, the method includes determining a location of the vehicle relative to a road network defined as a first location. A new location of the vehicle is determined relative to the road network and is defined as a second location. The first location of the vehicle is communicated to the remote location at a first frequency, and the second location of the vehicle is communicated to the remote location at a second frequency, which is different from the first frequency. [A1930]

"Passive traffic lane marking for on-board detection of lane boundary"

A system and process for detecting a traffic lane boundary before it is potentially violated by a moving vehicle traveling in the lane. Passive RF tags or labels are embedded in a paint stripe running along pavement. A sensor in the vehicle emits an RF signal at a frequency to which the tags or labels are responsive. When the emitted signal is incident on a tag or label with strength indicative of straying of the vehicle from the lane toward incipient violation of the lane boundary defined by the stripe, the tag or label issues a return signal that is received by the sensor for on-board signaling of the potential violation to alter the driver so that corrective action can be taken. [A1931]

"Vehicular travel control device"

In a vehicular control device, it is necessary to measure or calculate six physical quantities-forward-reverse speed, left-right speed, vertical speed, pitch angle, roll angle, and angle of sideslip-representing vehicular movement and to control the braking force of each wheel and/or the damping coefficient of each suspension shock absorber in order to further shorten braking distance particularly at the time of braking and to prevent spin at that time. In this case, it is necessary to furnish sensors to measure speed and angle directly. In the present invention, four radar sensors are used in order to directly measure the forward-reverse speed and the left-right speed. Also, the vertical speed, the pitch angle, the roll angle, and the angle of sideslip are indirectly measured from the output of the radar sensors. By using three or four radar sensors, six physical quantities--the forward speed, the left-right direction speed, the vertical speed, the angle of sideslip, the pitch angle, and the roll angle--can be measured. Also, by using two radar sensors, three physical quantities--the forward speed, the left-right speed, and the angle of sideslip--can be measured. [A1932]

"System and method for estimating the azimuth pointing angle of a moving monopulse antenna"

An invention is provided for determining the azimuth pointing angle of a moving monopulse antenna. Pulses of energy are broadcast at the surface of a planetary body. Reflected signals are received from the surface of the planetary body using a plurality of feeds. A monopulse ratio is then calculated based on a sum pattern and a difference pattern. The sum pattern is based on the sum of the reflected signals received using the feeds, and the difference pattern is based on a difference of the reflected signals received using the feeds. An azimuth pointing angle of a monopulse antenna is then calculated using the monopulse ratio. [A1933]

"Radio-wave radar system and adaptive cruise control system"

In a radio wave radar system using a two-frequency CW modulation method, it is possible to detect a distance between a host vehicle and a forward vehicle and to realize a stable ACC following travel, even in a condition in which the relative speed is 0. By combining the two-frequency CW modulation method with the frequency pulse CW modulation method, that is, by using combination with the two-frequency CW method when the relative speed occurs and the frequency pulse CW method when the relative speed is close to 0, even if the relative speed is 0, the IF signal obtained from the reflected wave from the forward vehicle can be generated to detect the existence of the ACC target vehicle, so that it is possible to realize a stable ACC following travel. [A1934]

"Method and system for ground imaging"

A system and method for determining the slope of a ground imaged area. The system includes a camera, a memory, and a processor. The camera generates a first and a second image of an area of ground from an aircraft. The memory stores bi-directional characteristic information for associated materials. The processor determines a material type associated with a plurality of the pixels based on a color value of the pixels. The processor retrieves bi-directional characteristic information from the memory for a pixel based on the determined material type. A slope value at a pixel location is determined based on the associated viewing angle values, a determined radiance change value, and the retrieved bi-directional characteristic information. [A1935]

"System and method for detecting an intruder using impulse radio technology"

An intrusion detection system and method are provided that can utilize impulse radio technology to detect when an intruder has entered a protection zone. In addition, the intrusion detection system and method can utilize impulse radio technology to determine a location of the intruder within the protection zone and also track the movement of the intruder within the protection zone. Moreover, the intrusion detection system and method can utilize impulse radio technology to create a specially shaped protection zone before trying to detect when and where the intruder has penetrated and moved within the protection zone. [A1936]

"Adaptive weather radar detection system and method used in continental and maritime environments"

A method of adapting weather radar thresholds is disclosed. The method comprises generating a location from a location sensor, retrieving information representative of a weather type from a database, based on the location, and adjusting, automatically, the threshold for a radar display based on the information. [A1937]

"Radar antenna leveling system"

A remotely controllable, tiltable platform supports a radar transmitter/receiver for rotational movement of the radar relative to a mounting on a vessel, such as a mast of a sailboat or the superstructure of a power boat. A cowling extends upward from the foundation plate and a stationary hinge plate, parallel to the foundation plate, is secured to the top of the cowling. A top antenna mounting plate is hingedly secured to the stationary hinge plate. An actuator is positioned within the cowling to controlled movement of the top antenna mounting plate to maintain the radar level with the horizon. Alternatively, an A-frame structure mounts the leveling system to a mast of a sailboat. [A1938]

"Enhanced surveilled subject imaging"

An imaging system can include an antenna apparatus configured to transmit toward and receive from a subject in a subject position, millimeter-wave electromagnetic radiation. A subject may include a person and any object or objects with the person. A controller can include a transceiver configured to operate the antenna apparatus and produce an output representative of the received radiation, and a processor adapted to produce from the transceiver output, image data representative of an image of the subject. At least a first portion of an image signal representative of radiation received by an antenna apparatus may be used to produce first image data representative of a first image of at least a portion of the subject. Second image data representative of a second image having resolution that is different than that of the first image may be produced from at least a second portion of the image signal. [A1939]

"FM-CW radar apparatus"

An FM-CW radar apparatus capable of detecting a stationary object, in particular, an overbridge, located above the road ahead in a simple manner uses a traveling wave antenna as a transmitting antenna, and includes a means for varying, in upward and downward directions the projection angle of a combined beam pattern of a transmitted wave radiated from the traveling wave antenna, and an overbridge is detected by varying the projection angle of the combined beam pattern in the upward direction using the varying means. Further, a phase shifter for varying the projection angle of the beam pattern in upward/downward directions by controlling the phase of the radio wave to be transmitted or received is provided on either a transmitting antenna or a receiving antenna or on a transmitting/receiving antenna, and an overbridge is detected by controlling the phase shifter and varying the projection angle of the beam pattern in the upward direction. [A1940]

"Specific dielectric constant calibration method for an electromagnetic prober"

An electromagnetic prober comprising a transmission antenna, a reception antenna, a reception signal processing section for generating an analytic signal on the basis of a detection signal of the reception antenna, and an analytic processing section for performing a predefined analytic process on the basis of the analytic signal, wherein the analytic processing section divides the analytic signal into a plurality of time-based ranges and performs a predefined computation on average cycle periods in the respective time-based ranges of the analytic signal to calculate average dielectric constants in depth ranges of the medium corresponding to the respective time-based ranges. [A1941]

"Millimeter-wave active imaging system with modular array"

Active millimeter-wave imaging systems can include an antenna apparatus configured to transmit toward and receive from a subject in a subject position, electromagnetic radiation. A controller can include a transceiver configured to operate the antenna apparatus and produce an output representative of the received radiation, and a processor adapted to convert the transceiver output into image data representative of an image of the subject. The antenna apparatus may move in a partial or continuous loop around the subject, toward or away from the subject, or in an opposite direction to an associated antenna apparatus. Antenna units in the antenna apparatus may be oriented at different angular positions along an array. Antenna arrays may also be formed of a plurality of array segments, and a group of arrays may be combined to form an antenna apparatus. [A1942]

"Vehicle-installed radar sensor system and vehicle-installed radar sensor"

A vehicle-installed radar sensor system includes a transmission section, a reception section, and a shield member. The transmission section is disposed in a closed space formed between a permeable member provided in a vehicle and a vehicle body, and transmits a radar wave to outside of the vehicle through the permeable member. The reception section is disposed in the closed space at a distance from the transmission section, and receives a reflected wave by a target through the permeable member. The shield member is disposed in at least one of the transmission section and the reception section, and suppresses at least one of occurrence of a reflected wave by the permeable member and reception of the reflected wave by the permeable member. [A1943]

"Depth-based surveillance imaging"

A subject may be interrogated with electromagnetic radiation for producing image data representative of an image of the subject. First and second image data, produced based on reflectivity in first and second frequency ranges, may be related. In some examples, image data for one picture element may be produced based at least in part on reflectivity of the radiation at a depth selected based at least in part on a depth of another picture element. In some examples, plural images may be produced based on reflectivity at different depths. In some examples, a value of reflectivity may be determined for an intermediate depth between two adjacent depths of image data based at least in part on reflectivity of the radiation for a plurality of spaced-apart depths. [A1944]

"Method and system for determining location by implication"

Systems and methods for determining location by implication are described. A responsive environment includes a location determination method that operates in an area that is only partially instrumented with location-sensing devices. Some of the with location-sensing devices sense location ambiguously. for example, a location-sensing device may be deployed at a boundary between two target objects or areas of interest. The location of the target object, as reported by such devices, is considered ambiguous. While the object or person is known to be in a space, it is not clear which specific space. The location of ambiguously located objects can be disambiguated based on changes in the location of other objects. for example, if a document is placed on a shelf in an office, such action strongly implies that someone is in the office. Therefore, if a person is known to potentially be in the office or the outside hallway, the person's location is changed to be in the office. [A1945]

"Method for measuring material level in a container using RFID tags"

A level of liquid of pulverent solids in a container (or volume of a liquid in the absence of gravity) is detected by using radio frequency identification (RFID) tags or similar transponders located inside or outside the container. The interrogation signal and/or the return signal is attenuated by the material and the signal strength of the return signal, if any, is evaluated either directed or in a binary fashion by imposing a threshold to determine whether or not material in contained in a portion of the container corresponding to the location of a particular RFID tag or transponder. Volume, pressure and container orientation can also be derived in accordance with one or more return signals. [A1946]

"Centerline and depth locating method for non-metallic buried utility lines"

A locator capable of tracking buried, non-metallic utility lines (fiber optic, gas, water, waste, conduits) using ground penetrating radar (GPR) and an inertial position sensor is described. In some embodiments, a tracking filter is applied to a hyperbolic trajectory model based on the radar range data to determine a predicted track of the target utility line. After comparison of the predicted track to the measured inertial position, the centerline variance of the tracked line can be deduced. In some embodiments, an electromagnetic pipe and cable locator may also be included. Some embodiments of the invention can include accurate depth calibration and line depth tracking. Further, a display may provide results to a user in a simplified fashion. [A1947]

"Electromagnetic wave absorber and a process of producing same"

An electromagnetic wave absorber having an excellent electromagnetic wave absorption characteristic in 5 to 6 GHz band. The electromagnetic wave absorber has a matrix and powder filled in the matrix. The particles of the powder have electrical conductivity at least in surface regions thereof and have a particle diameter of 3 to 20 .mu.m as expressed by D.sub.50 value. A volumetric ratio (V) in which the powder is filled in the matrix is set such that a standardized value expressed as a value obtained by dividing a complex relative permeability (.mu.") of the electromagnetic wave absorber in a frequency band to be absorbed thereby by the volumetric ratio (V) is constant as far as the particle diameter of the powder used, as expressed by the D.sub.50 value, is within the range of 3 to 20 .mu.m. [A1948]

"Freight container monitoring system"

A system and a method for monitoring a freight container are provided. The method includes the steps of generating a resonant spectrum representative of an initial condition of internal surfaces and contents of the freight container, and saving the resonant spectrum for future comparison purposes. The method further includes generating a second resonant spectrum and comparing the second resonant spectrum with the initial resonant spectrum to determine whether there has been any tampering with the freight container. The method also includes identifying the contents of the freight container and generating loading diagrams of the contents and using polarity configuration characteristics of the internal surfaces of said freight container to determine whether the contents have moved or been shifted during transport. [A1949]

"Subsea communication"

Methods of subsea communication in which a cathodic protection anode is used as a transmitting antenna. The signals are received at a second location by two electrodes which are spaced apart by different distances from the transmitting antenna. [A1950]

"Detector and lock controller using same"

A lock controller has main apparatus provided to a lockable door and a detector for detecting an approaching or retreating target object. The detector includes an oscillator device for generating a transmission wave, a branching device for branching the transmission wave, a transmission device for transmitting the transmission wave into space as electromagnetic waves, a reception device for receiving the transmission wave reflected by the target object, a mixer for mixing a reception signal received by the reception device and a branched signal branched by the branching device to output a mixed signal, and a judging device for switching on a detection output indicating the target object approaching and retreating based on an increase and a decrease of the mixed signal outputted from the mixer. A detection distance is set within 1/4 wavelength of frequency effective for the detection. The main apparatus sends by wireless transmission a specified request signal to a portable device carried by the user, and if an answer signal is received from the portable device in response, causes the lockable part to be unlocked after ascertaining that the received answer signal is a correct signal. [A1951]

"Vehicle-mounted millimeter wave radar device, millimeter wave radar module, and manufacturing method thereof"

An object of the present invention is to provide a millimeter wave radar device and module that provides a hollow structure while assuring adequate moisture resistance. A multilayer substrate on which at least one millimeter wave MMIC is mounted and a cap for forming a hollow around the MMIC are joined together with an adhesive or other similar organic member to obtain a high-frequency characteristic. The resulting assembly is housed in a case and covered with a moisture resistance by a gelled organic resin. The nonairtight structure obtained in this manner permits the use of low-cost members and provides increased productivity. [A1952]

"Radar measurement device, especially for a motor vehicle, and method for operating a radar measurement device"

The present invention relates to a radar measuring device which, with a simple design, ensures reliable distance determination even when a mixed signal is zero, and a method for operating a radar measuring device. The radar measuring device includes: A high-frequency oscillator (11) which emits two different carrier frequency signals (F1, F2) , A first switching device (14) for switching the carrier frequency signals (F1, F2) as a function of first pulse signals (P1) and emitting radar pulse signals (T1, 2) , A transmission antenna (16) and a receiving antenna (18) , A second switching device (24) for switching the carrier frequency signals as a function of a delayed second pulse signal (P2) and emitting delayed radar pulse signals (S1, 2) , A mixing device (21) for mixing received radar signals (R1, 2) with the delayed radar pulse signals (S1, 2) and emitting mixed signals (M1, 2) . The phase differences between the received radar signals (R1, 2) and delayed radar pulse signals (S1, 2) differ by a predetermined value when the two carrier frequency signals (F1, 2) are emitted. An amplitude signal is subsequently determined from the first and second mixed signal (M1, 2) . [A1953]

"Radar sensor platform"

A radar sensor platform for clearance measurement in a vehicle has at least four radar sensors, an input being entered if necessary using an input device indicating that a width measurement of a parking space is desired and the four radar sensors then enlarging their horizontal beam angle and the arrangement for acoustic and/or visual output emitting a signal as a function of the measurement of the parking space width. This signal is, for example, the parking space width or a warning. The horizontal beam angle for the parking space measurement is at least 170.degree.. The side clearances of the vehicle in the parking space may also be displayed. Furthermore, centered parking is possible using the acoustic and visual aids. The radar sensor platform may be installed either in the front and/or rear of the vehicle. [A1954]

"Technique for cancellation of elevated clutter for the detection of fixed and ground moving targets under trees"

A target is detected under a forest canopy or other elevated clutter where the target is obscured by the elevated clutter. Radar returns reflected from the target on the surface, combined with those from the elevated clutter are digitized. Motion compensation is performed for the radar returns with respect to the target to obtain a focused first synthetic aperture image of the target. Next, the radar returns are motion compensated with respect to the elevated clutter at various heights above the surface to obtain images of the elevated clutter. The elevated clutter within the images at the various heights above the surface is identified and coherently subtracted from the original synthetic aperture images. [A1955]

"Method and apparatus for transmitting electromagnetic signals into the earth at frequencies below 500 KHz from a capacitor emplaced on the surface of the earth or raised aloft in an aircraft"

A method and apparatus comprising four co-planar metallic plates, two for transmission and two for reception, in which each pair of co-planer metallic plates of overall length L are disposed either in direct contact with the earth or are elevated a distance Z above the earth to form a capacitor comprising the metallic plates and the earth if Z=0 or if Z>,0, the metallic plates, the air space and the earth. A short voltage or current pulse is applied to this capacitor via a transformer in which the magnetic flux current is adjusted to provide a pulse of the desired frequency composition in the air-earth propagation medium. This results in a frequency controlled pulse of electromagnetic radiation into the targeted subterranean geology at frequencies < 500 KHZ. In the preferred embodiment, the electromagnetic radiation that has propagated through the subsurface is iterated against a theoretical model for earth propagation of vertically traveling up-going and down-going waves to get a solution for the magnitude of the electrical properties as a function of the depth in the medium through which these waves have traveled. Electrical property vs depth profiles of the relative dielectric and the conductivity in addition to wave velocity and attenuation rate at depth in the subsurface are recovered by the iteration. for operation at capacitor altitude Z above the surface of the earth, the overall size of the capacitor, L, can be specified for use in the pulse spectrum below 500 khz. [A1956]

"Systems and methods for characterizing the coverage of ad hoc sensor networks"

The systems and methods according to this invention disclose that coverage for an ad hoc sensor network is fundamental to the deployment and utilization of such networks. The invention provides a method which characterizes the coverage of an ad hoc sensor network by defining a sensing field over the space within which the physical phenomenon of interest occurs. Its value at any given point reflects the ability of the sensor network to estimate the phenomenon and/or event, of interest at this point. A statistical method is presented to determine such a field based on sensor layouts and sensor models. The system and methods of the invention define well monitored regions and sensor holes, information that can be used to characterize the quality of service that the network provides for different applications. A graphical user interface may be provided to display this information to the user for monitoring in health management of the network. The systems and methods of the invention apply to fixed as well as mobile sensors. [A1957]

"Traffic radar system with improved patrol speed capture"

A traffic radar captures the patrol vehicle return signal by saving the patrol return when the radar system is placed in a standby state. If the radar is in standby for more than a predetermined period of time before reentering a transmitting mode, the system searches for a new patrol signal within a speed window around the saved patrol signal speed. If the radar is in standby for less than the predetermined period of time, the system initially searches for a new patrol signal over a range that excludes an interval around the saved patrol signal speed. If the new patrol signal is not found, then in a subsequent search the interval is included in the searched spectrum. [A1958]

"Intruding object detecting apparatus, and setting apparatus, setting process and setting confirmation process therefor"

Provided are an intruding object detecting apparatus (a radio wave sensor) capable of setting an arbitrary detection region, an apparatus for setting the detection region and a setting processe. An intruding object detecting apparatus 51 is installed in a corner of a room 53, a coordinate system is defined in which a location of the intruding object detecting apparatus 51 is an origin thereof, and coordinates are a distance r from the intruding object detecting apparatus and a scanning angle .theta. of a transmission antenna/reception antenna of the intruding object detecting apparatus, and a state corresponding to the coordinate system is stored (b) in a storage means, thereby enabling the detection region 52 of the intruding object detecting apparatus can be arbitrarily set. Moreover, the setting can be performed with ease using a reflector or a transmitter, or alternatively, using a setting apparatus constituted of the reflector and the transmitter, combined. [A1959]

"Process for sensor resources management"

The subject process accepts the data from a kinematic tracker and maps them to fuzzy set conditions. Then using a multitude of defined membership functions and fuzzy logic gates, generates sensor mode control rules. It does this for every track and each sensor. The Rule with the best score becomes a sensor cue, which is used to place the sensor into one of three operating modes. If there are ambiguities do to one or more vehicles coming in to close proximity to each other process compares radar profiles of vehicle to those stored in an "on the fly" data base to eliminate the ambiguities. [A1960]

"Object collision avoidance system for a vehicle"

A collision avoidance system for a vehicle includes a warning device and a plurality of sensors that are arranged around the vehicle and that have sensing zones. Each of the sensors senses objects that are located in the sensing zone and generates sensor signals that are related to a distance between respective ones of the sensors and the objects in the sensing zones. Memory stores a plurality of profiles, which defines alarm limits for each of the sensors. A profile selection device allows selection one of the plurality of profiles from the memory. A vehicle collision avoidance controller communicates with the plurality of sensors and triggers the warning device when the sensor signal that is associated with one of the plurality of sensors exceeds a respective one of the limits in the selected profile. [A1961]

"Enhanced dead reckoning method"

An enhanced dead reckoning method determines the position of a participating vehicle. The participating vehicle is unable to receive signals from global positioning satellites. The position is calculated by way of observed time difference calculations and received signal strength indications. The position is also calculated by communicating with other participating vehicles or egress points. [A1962]

"Radar level-measuring device"

A method and a device for measuring, by means of radar, in an enclosed space (1) in which a liquid (2) is stored, the level of a liquid surface (6) , where the method involves the steps: a radar unit (3) mounted on the roof (4) of the enclosed space transmits a microwave signal downwards into the enclosed space (1) through a waveguide (7) that communicates with the liquid in the enclosed space, the transmitted microwave signal's polarization alters according to a predetermined time sequence in such a way that the signal is propagated alternatively at least in a first and a second plane of polarization, the signal transmitted in the first plane of polarization is reflected by the liquid surface (6) back to the radar unit (3) , the signal in the second plane of polarization is reflected by at least one reference transmitter placed at a known distance from the radar unit, a calculating unit calculates the level of the liquid surface based partly on the propagation time for the microwave signal, i.e. for the time between the signals emitted and received by the radar unit, partly on the microwave signal's velocity of propagation, which is obtained from measurements in relation to the references. [A1963]

"2-d range hopping spread spectrum encoder/decoder system for RF tags"

An airborne radar interrogates tags on friendly ground vehicles, which when interrogated by a downlink signal from the radar, sends back a very low level uplink message signal that appears noise-like so as to avoid enemy detection and exploitation. This is achieved by retransmitting a time delayed and phase shifted version of the transmitted pulse from the radar. The digital RF tag captures every other pulse from the radar and transmits a digitally coded spread spectrum pulse back to the radar during every other intervening pulse which includes a pseudo random delay (range hop) and a pseudo random phase (direction) . [A1964]

"Reducing antenna boresight error"

Reducing antenna boresight error includes receiving radar pulses reflected from the ground, where pulses are emitted from the antenna of a radar system, reflected by the ground, and received by the antenna. The return pulses carry information about the ground. Measurement indices are established from radar and platform parameters, and a clutter spectrum is generated from the return pulse information. The amplitude of the clutter spectrum is measured at each of the measurement indices. Whether there is an amplitude imbalance is established in accordance with the measured amplitudes. An error estimate describing an antenna boresight error is determined if there is an amplitude imbalance. [A1965]

"Level meter"

The invention relates to a microwave-operated level meter with a small blind zone, comprising an antenna for transmitting or for transmitting and receiving microwaves, a microwave generator directly located on said antenna, and a transmitter or transmitter and receiver element pointing into the antenna and directly linked with the microwave generator, said transmitter or said transmitter and receiver element being an extension of the connection. [A1966]

"System and method for calibrating a vehicular traffic surveillance Doppler radar"

A system and method for calibrating a vehicular traffic surveillance Doppler radar are disclosed. In one embodiment, a modulation circuit portion generates double-modulated FM signals. An antenna circuit portion transmits the double-modulated FM signals to a target and receives reflected double-modulated FM signals therefrom. A calibration circuit portion responds to the reflected double-modulated FM signals by sending a calibration signal to the modulation circuit. The calibration signal is indicative of a relationship between a first range measurement derived from phase angle measurements associated with the reflected double-modulated FM signals and a second range measurement derived from speed and time measurements associated with the reflected double-modulated FM signals. [A1967]

"Automatic data capture technology to enhance data collection"

Method, apparatus and system for determining accurately at least one coordinate of a sensor (or a transducer including a sensor) relative to a predetermined reference location, particularly where the sensor is part of a transducer for ground penetrating radar. A marker detector is positioned in a predetermined relationship with the sensor, a marker is detected with the marker detector and positional information associated with the marker is received, from which a position of the transducer or sensor is determined, based on the received positional information associated with the marker and the predetermined relationship between the marker detector and the sensor. The marker may, for example, be a bar code and the marker detector may be an optical scanner. The sensor may be a receiving antenna for a GPR signal. [A1968]

"Method for determining geometric data for vehicle parking processes"

Method for determining geometric data for parking processes of vehicles, wherein the lateral distance between the vehicle and a curb is measured several times successively by means of a distance sensor attached to the vehicle as the vehicle is driven by the parking space. The angle of the longitudinal axis of a vehicle and the curb is ascertained by determining a sideways movement angle between the present longitudinal direction of the vehicle and a preset longitudinal direction, which angle results from the sideways movement of the vehicle as it is driven along, by determining a curb angle between the preset longitudinal direction and the curb, which angle results from the course of the curb contour, and by determining the angle between the present longitudinal axis of the vehicle and the curb by adding the angle of sideways movement and the curb angle. [A1969]

"Method for simple and multipurpose tracking"

A method for measuring distance and relative speed between two points, one of which is stationary. The method employs a radio signal modulating a periodic pulse train sent from stationary point to a movable point and simultaneously being retransmitted back to the stationary point with both the transmission and the retransmission occurring during exactly the same period of time. The number of pulses sent from the stationary point during that period of time is known. The number of pulses received by the stationary point during the transmission period, being less than all of the pulses sent to the movable point is used to determine the distance. The process is repeated after a precise time period of no transmissions and a new distance is between the points is determined. Knowing the change in distance and the precise time period over which the change occurred, permits a determination of relative speed of the two points. [A1970]

"Target determination apparatus"

A target determination apparatus includes a reception unit, a judgment unit, and a determination unit. The reception unit receives a reflection wave from a target. The judgment unit judges as to whether or not a fluctuation state of reception intensity of the reflection wave with time corresponds to a distinction state occurring when the target is a predetermined type, on the basis of information concerning the reception intensity of the reflection wave. The determination unit determines type of the target on the basis of judgment result of the judgment unit. [A1971]

"On-vehicle radar system"

An on-vehicle radar system capable of detecting a range error from range data based on an echo from a target (6) . Range error is detected when amplitudes of beat frequency components in two adjacent range gates are substantially equal. The system includes a transmitting unit (1, 2, 4, 5) for radiating a modulated wave having frequency increasing and decreasing repetitively after pulse modulation, a receiving unit (8, 9, 10, 11, 12) for receiving the echo, and an arithmetic unit (13) for detecting a range error ascribable to aberration of modulation band width due to frequency increase and decrease of transmission wave (W1) by comparing a range corresponding to the range gate with that determined from a frequency difference between transmission wave and echo. The arithmetic unit (13) detects the range error on the basis of frequency difference components having substantially same amplitudes in adjacent range gates. [A1972]

"Surface acoustic wave sensor or identification device with biosensing capability"

A surface acoustic wave sensor or identification device has a piezoelectric material, and an interdigitated transducer (IDT) input/output mounted on the piezoelectric material for receiving a radio frequency (RF) signal and propagating a corresponding surface acoustic wave along a surface of the piezoelectric material. An IDT finger electrode array is mounted on the piezoelectric material and is operable to communicate with the IDT input/output for transmission of a modified RF signal from the device. The IDT finger electrode array has at least one finger electrode segment whose propagating characteristics are controlled to control the nature of the modified RF signal. A biolayer is mounted on the piezoelectric material and is associated with the finger electrode segment, and a fluidic chamber is associated with the biolayer. In use, the fluidic chamber contains fluid which, if a predetermined substance to be sensed or detected is present, operates to modify the biolayer which in turn controls the nature of the modified RF signal. [A1973]

"Modulation circuit for a vehicular traffic surveillance Doppler radar system"

A modulation circuit for a traffic surveillance Doppler radar system is disclosed. In one embodiment, the modulation circuit is utilized in a vehicular traffic surveillance Doppler radar system that processes a reflected double-modulated FM signal to determine a target range based upon a phase angle signal differential associated with the target. The modulation circuit may include a digital-to-analog (D/A) converter/voltage regulator/oscillator arrangement or a D/A converter/varactor device/oscillator arrangement. The modulation circuit generates a double-modulated FM signal based upon a frequency versus voltage characteristic associated with the oscillator. [A1974]

"Simultaneous dual polarization radar system"

A simultaneous dual polarization radar system is disclosed that utilizes a RF power divider to replace the high speed dual polarization switches utilized in current dual polarization radar systems. The disclosed systems allow for transmission and reception in both horizontal and vertical signal modes simultaneously while repositioning critical receiver components above the elevation rotary coupler in a radar pedestal. A bypass switch is also utilized to allow for mode switching of a radar system and a dual polarization reception design is shown to allow for the economical capturing of linear depolarization ratios of selected atmospheric areas. These new designs eliminate the current problems experienced in current dual polarization radar system of long dwell times and velocity range reductions, and the elimination of the relatively expensive and unreliable polarization switch. [A1975]

"System and method for active protection of a resource"

An active protection system comprising an ultrawideband radar for threat detection, an optical tracker for precision threat position measurement, and a high powered laser for threat kill or mitigation. The uwb radar may use a sparse array antenna and may also utilize Doppler radar information. The high powered laser may be of the optically pumped solid state type and in one embodiment may share optics with the optical tracker. In one embodiment, the UWB radar is used to focus the high power laser. Alternative interceptor type kill mechanisms are disclosed. In a further embodiment, the kill mechanism may be directed to the source of the threat. [A1976]

"Friend/foe identification system for a battlefield"

The invention relates to an IFF apparatus for ground applications, which comprises: (a) an encoder for forming an interrogating or response sequence of pulses, and conveying the same to a UWB transmitter, (b) an UWB transmitter for getting said interrogating or response sequence of pulses, forming a corresponding interrogating or response signal of a sequence of UWB pulses, and transmitting the same via a UWB transmitting antenna, (c) a plurality of UWB receiving antennas, disposed away one from the other, for receiving either an interrogating signal or a response signal sent by another IFF apparatus, (d) a decoder for getting from at least one of said UWB receiving antennas received signals, decoding the same, comparing the decoded signal with a bank of pre-stored signals, and determining whether a received signal is an interrogating or response signal, and (e) a processing unit for, upon receipt of a signal of response to an interrogation signal sent by the present IFF apparatus, calculating the location of the responding IFF apparatus by: (I) determining the range R by the time delays between the interrogating and response signals, (II) determining the direction vector to the responding IFF apparatus by evaluating the time differences between arrival of each response pulse to a plurality of receiving antennas, and (III) determining the identity of the responding IFF apparatus by checking the received sequence of UWB pulses, assuming that the sequence of each IFF apparatus is unique. [A1977]

"Device for detecting object in front of vehicle"

A device including a radar and a camera for detecting an object located in front of an automobile is mounted on the automobile. The radar detects a distance from the automobile to the front object, and the camera takes an image of the object. When the object such as a preceding vehicle moves out of a region detectable by the radar while remaining in a region covered by the camera, a present distance to the object is calculated based on the distance previously detected by the radar and memorized in a memory and a present object image taken by the camera. More particularly, the present distance is calculated by multiplying the memorized distance by a ratio of an object size in the memorized image to an object size in the present image. [A1978]

"Systems and methods for displaying hazards"

A system, according to various aspects of the present invention, provides a presentation to a hazard display. The system includes a memory having surveillance data and a processor. The processor updates an image in accordance with the surveillance data to provide an updated image. The processor also prepares a presentation in accordance with the updated image. The processor further provides the presentation to the hazard display. At least one of updating, preparing, and providing utilize a first scan mode for a hazardous region of the presentation and a second scan mode for a nonhazardous region of the presentation. [A1979]

"Non-intrusive inspection impulse radar antenna"

An apparatus and method for detecting objects buried beneath the surface of a medium. A plurality of wide-bandwidth antennas, coupled to form an array, is drawn across the surface. Each antenna radiates a plurality of pulses of electromagnetic radiation at periodic intervals of time and receives the plurality of pulses after their interaction with the medium. The return pulses are sampled by a sampling circuit disposed at the feed of each antenna so as to create an equivalent-time pulse signal, and a self-signature of each antenna is subtracted from the equivalent-time pulse signal so as to detect features of objects buried beneath the surface of the medium. A pulse former is provided at the feedpoint of the receiving antenna. [A1980]

"Vehicular traffic surveillance Doppler radar system"

A vehicular traffic surveillance Doppler radar system and method for use of the same are disclosed. In one embodiment, the system comprises a modulation circuit portion for generating modulated FM signals. An antenna circuit portion transmits the modulated FM signals to a target and receives the reflected modulated FM signals therefrom. A ranging circuit portion performs a quadrature demodulation on the reflected modulated FM signals and determines a range measurement based upon phase angle measurements derived therefrom. [A1981]

"Process and devices for determining the radio reception direction in a mobile communications network"

A process is proposed for determining the radio reception direction on the downlink at a radio base station location, comprising a plurality of radio coverage areas, in a mobile communications network, in which in each area on the downlink radio signals are radiated by means of a transmitting antenna for reception by at least one mobile communications terminal. for the determination of the radio reception direction, at least the reception levels of the radio signals radiated by a first and a second of the transmitting antennae are measured by the relevant mobile communications terminal. From the two measured reception levels, a ratio value is formed which is independent of the prevailing radio propagation conditions, and this ratio value is used to effect an estimation of azimuthal angles for the radio reception direction to be determined. The invention can thus be implemented in any individual radio base station location, it being unnecessary for there to be contact with a plurality of radio base stations. The calculation of a ratio value serves to eliminate influences which can arise from changing radio propagation conditions. In this way a reliable estimation of the azimuthal angles and determination of the radio reception direction is possible. This is independent of the prevailing radio propagation conditions. [A1982]

"Holographic arrays for threat detection and human feature removal"

A method and apparatus to remove human features utilizing at least one transmitter transmitting a signal between 200 MHz and 1 THz, the signal having at least one characteristic of elliptical polarization, and at least one receiver receiving the reflection of the signal from the transmitter. A plurality of such receivers and transmitters are arranged together in an array which is in turn mounted to a scanner, allowing the array to be passed adjacent to the surface of the item being imaged while the transmitter is transmitting electromagnetic radiation. The array is passed adjacent to the surface of the item, such as a human being, that is being imaged. The portions of the received signals wherein the polarity of the characteristic has been reversed and those portions of the received signal wherein the polarity of the characteristic has not been reversed are identified. An image of the item from those portions of the received signal wherein the polarity of the characteristic was not reversed is then created. [A1983]

"Road curvature estimation and automotive target state estimation system"

A first Kalman filter estimates true measures of yaw rate and vehicle speed from associated noisy measures thereof generated by respective sensors in a host vehicle, and a second Kalman filter estimates therefrom parameters of a clothoid model of road curvature. Measures of range, range rate, and azimuth angle from a target state estimation subsystem, e.g. a radar system, are processed by an extended Kalman filter to provide an unconstrained estimate of the state of a target vehicle. Associated road constrained target state estimates are generated for one or more roadway lanes, and are compared--either individually or in combination--with the unconstrained estimate. If a constrained target state estimate corresponds to the unconstrained estimate, then the state of the target vehicle is generated by fusing the unconstrained and constrained estimates, and otherwise is given by the unconstrained estimate alone. [A1984]

"Apparatus for detecting position information of a moving object"

An apparatus for detecting position information of a moving object. The apparatus includes a transponder, a communication module, and a reader. The transponder is installed on a predetermined location of a road and stores position information associated with the installed location. The communication module is mounted to a moving object, emits an RF (Radio Frequency) signal toward a road surface, and receives position information associated with the transponder's installation location from the nearest transponder using an RF signal. The reader receives position information associated with the transponder's installation location from the communication module, and reads a current position of the moving object. The apparatus minimizes a data error between the detected position information. The transponder installed on a road is driven by RF signals received from external devices, resulting in increasing a lifetime of the transponder. This apparatus minimizes the cost of OAM (Operation, Administration, and Maintenance) . [A1985]

"Method and apparatus for identifying buried objects using ground penetrating radar"

An apparatus for identifying a buried object using ground penetrating radar (GPR) in a system containing at least one GPR sensor, comprises a data processor for detecting spatial correlations in data received from a GPR sensor in the apparatus and an image processor capable of building a data structure corresponding to an image of the buried object from data processed by the data processor. A method for identifying a buried object using GPR in a system containing a GPR sensor comprising detecting spatial correlations in data received from the GPR sensor in the system and building a data structure corresponding to an image of the buried object from the received data. [A1986]

"Systems and methods for identifying targets among non-targets with a plurality of sensor vehicles"

A plurality of sensor vehicles collect imaging data from an assigned location of a target region having targets and non-targets. The imaging data may be combined based on its location and the combined data is matched to a threat object map to identify the actual targets from the non-targets. In some embodiments, the sensor vehicles may be redirected to collect velocity and/or range information on the identified targets. [A1987]

"Method and apparatus for joint kinematic and feature tracking using probabilistic argumentation"

A method, apparatus, and computer program product for joint kinematic and feature tracking are presented. Kinematic measurements and feature/class measurements regarding an object are received from a sensor. A probabilistic argumentation operation is performed on the feature/class measurements using information from a knowledge base and a track file ect to generate feature track likelihood scores regarding likely tracks for the object. Kinematic track likelihood scores are generated based on the kinematic measurements and the track file. Joint track likelihood scores are generated based on the feature track likelihood scores and the kinematic track likelihood scores. Joint track likelihood scores are used to generate a multi-frame track measurement association to determine a most likely track for the object. The track file is continually updated with the most likely track for the object, so that the most likely trajectory of the object is obtained. [A1988]

"Object detector and object detecting method"

A plurality of primary detection regions A to I are scanned by switching a beam width and a beam direction of an antenna. The primary detection regions A to I are formed such that one detection region overlaps at least one of other detection regions. A small region (any one of secondary detection region (1) to (14)) corresponding to a region provided by excluding a region corresponding to a sum of set of the detection regions where a detection object was not detected, from a region corresponding to a product set of the primary detection regions where the object was detected is specified as a bearing in which the object exists, based on detection results of the respective primary detection regions. [A1989]

"Method of and apparatus for acquiring data of dynamic physical processes via a radio link"

For acquiring data of dynamic physical processes via a radio link, a transponder antenna (17) is excited by an electromagnetic exciting wave at the resonance frequency of the transponder antenna (17) , and a back-scattered electromagnetic sensor wave which is modulated by a sensor (16) having an electrical impedance depending on the data to be acquired is received and analyzed. The sensor (16) is directly connected to the transponder antenna (17) such that the sensor changes the electrical impedance of the transponder antenna (17) with every variation of the data to be acquired. The electromagnetic wave which is back-scattered by the transponder antenna (17) is received as the sensor wave at the same time as the transponder antenna (17) is excited by the exciting wave. [A1990]

"Telematic method for real-time routing to stolen vehicles"

A telematic system includes a first telematic unit incorporated within a stolen vehicle, a call center, and a second telematic unit incorporated with a police vehicle. The telematic system implements a method for real-time routing to the stolen vehicle. The method cyclically involves a determination of the GPS coordinates of the stolen vehicle and the police vehicle by the respective telematic unit, a calculation of a complete route from the police vehicle to the stolen vehicle, and a calculation of a partial route extending from the police vehicle to the stolen vehicle. The GPS coordinates of the stolen vehicle can be pushed to the police vehicle whereby the second telematic unit obtains the route calculations. Alternatively, the GPS coordinates of both the stolen vehicle and the police vehicle can be pushed to the call center whereby the call center performs the route calculations. [A1991]

"Noise modulated remote distance measurement"

The invention relates to remote distance measurement by means of a transmitted noise modulated probing signal (E) , whereby at least one of a distance (Y (t)) and a velocity (V (t)) in relation to a signal transceiver (200) is determined. The probing of signal (E) is generated on basis of at least one first noise signal (x.sub.1 (t) , x.sub.2 (t)) . The transmitted signal (E) is presumed to be reflected to the signal transceiver (200) via at least one signal reflecting object in the form of an information carrying signal (e) . This signal thus constitutes a delayed and possibly doppler shifted version of the transmitted signal (E) . Moreover, according to the invention, a second noise signal (x.sub.2 (t)) is added either to the probing signal (E) before it is transmitted or to the information carrying signal (e) before information pertaining to the reflecting object is derived there from. A primary signal (P.sub.1 (x.sub.1)) is generated, which is based on the first noise signal (x.sub.1 (t)) and a secondary signal (P.sub.2 (x.sub.1, x.sub.2)) is generated, which is based on the information carrying signal (e) . Thanks to the contribution from the second noise signal (x.sub.2 (t)) the subsequent signal processing of the primary signal (P.sub.1 (x.sub.1) and the secondary signal (P.sub.2 (x.sub.1, x.sub.2)) can be performed with a high linearity at the same time as a comparatively simple equipment can be can be utilized for digitizing (240) signal components (S.sub.I, S.sub.Q, R.sub.I, R.sub.Q) , which have been demodulated from the primary signal (P.sub.1 (x.sub.1)) and the secondary signal (P.sub.2 (x.sub.1, x.sub.2)) respectively. The solution according to the invention is also applicable at remote distance measurement by means of a digital group antenna system. [A1992]

"RF channel calibration for non-linear FM waveforms"

A system, method, and computer program product that performs self-calibration of pulse-compression radar signals. The system includes an antenna, a receiver, a transmitter, and a radar signal processor. Under normal (non-calibration) operation the radar transmitter generates a pulse compression waveform and transmits it via the antenna. Any reflections from this waveform are detected by the same antenna and processed by the receiver. The received radar signal then undergoes pulse compression followed by more mode-specific processing (windshear, weather, ground map, etc.) by the radar processor. During calibration, the radar transmitter generates a similar pulse compression waveform (i.e., calibration pulses) , but the calibration pulses bypass the antenna and go directly to the receiver via a "calibration path" built into the hardware. The resulting calibration pulses are used to generate a calibration filter. The calibration filter is applied to the received radar signals in the frequency domain either before or after pulse compression. [A1993]

"Vehicle-onboard signal processing device and vehicle-onboard radar system"

In order to magnetically shield the transmission line which connects the external connector mounted on the outer housing with the internal circuit and also to make it possible to freely mount the external connector without being limited by the position of the internal circuit, an outer housing 60 consists of an outer housing main body 61 and a shielding layer 62 applied to the inner-periphery surface of the outer housing 60. An transmission line 73 extends from the internal circuit through the outer-periphery side of the shielding layer 62 of the outer housing 60 along the shielding layer 62 to the desired position, where the external connector 70 is placed. [A1994]

"Device and method for registering, detecting, and/or analyzing at least one object"

In order to refine a device and a method for registering, detecting, and/or analyzing at least one object, a registration range and/or at a detection gate being displaced at a scanning speed over a measuring range, in such a way that a target-unique velocity measurement is ensured in continuous detection operation with low latency time and resistance to fluctuations, it is provided that, the receive circuit be divided into at least two channels, which are operable separately from one another, in particular using at least one power divider unit connected downstream from the output terminal of the I/Q mixing unit, of which the first channel of the receive circuit is designed for the purpose of displacing the registration range and/or the detection gate at a constant scanning speed over the entire measuring range, and the second channel of the receive circuit is designed for the purpose of displacing the registration range and/or the detection gate at a variable, in particular reducible scanning speed over the measuring range and/or setting the registration range and/or the detection gate at a predefinable position within the measuring range for a predefinable period of time at a negligible scanning speed. [A1995]

"Object sensing apparatus"

An object sensing apparatus for driver assistance systems in motor vehicles, including at least two sensor systems which measure data concerning the location and/or motion status of objects in the vicinity of the vehicle, and whose detection regions overlap one another, characterized by an error recognition device that checks the data measured by the sensor systems for absence of contradictions, and outputs an error signal upon detection of a contradiction. [A1996]

"Identical object determination method and apparatus and displacement correction method and apparatus"

An identical object determination method of determining whether or not objects are detected by a plurality of sensors identical has a determining a relative position and speed thereof, a determining a position error thereof based on the determined positions and calculating a first probability that the detected objects are identical with respect to the position from the determined position error based on a normal distribution concerning the position error, a determining a speed error thereof based on the determined speed and calculating a second probability that the detected objects are identical with respect to the speed from the determined speed error based on a normal distribution concerning the speed error, a calculating a third probability that the detected objects are identical based on the calculated first probability and the calculated second probability, and a determining that the detected objects are identical if the third probability exceeds a first determination value. [A1997]

"Clutter rejection in a passive radar receiver of OFDM signals with antenna array"

The invention concerns a passive radar receiver with an array of antennas for a OFDM received signal comprising frames of symbols each emitted on coded orthogonal carriers. After formatting received signals into digital symbols, dummy signals from dummy OFDM emitters at different distances from and in different directions relative to the receiver are generated and added to the signals picked up by the antennas. The modified received signals are filtered by means of inverse covariance matrices in order to eliminate at least unwanted zero Doppler effect signals and to provide an isotropic reception diagram without blind sector of direct path being generated and by detecting mobile targets along the direct path. [A1998]

"Method and apparatus for discriminating a target objective, and related program"

An average power value of a peak pair corresponding to a subjective target objective is converted into a radar cross section, to calculate a normalized average power value NP and a standard deviation DP representing a temporal dispersion of a power difference between peak pairs. When the value NP is larger than an automotive vehicle discriminating threshold THnp, the attribute of the subjective target objective is set to "automotive vehicle." When the value NP is not larger than the threshold THnp and the deviation DP is larger than a human objective discriminating threshold THdp, the attribute of the subjective target objective is set to "non-vehicle objective: human objective." Furthermore, when the value NP is not larger than the threshold THnp and the deviation DP is not larger than the threshold THdp, the attribute of the subjective target objective is set to "non-vehicle objective: non-human." [A1999]

"Method and apparatus for detecting, mapping and locating underground utilities"

The method and device for locating underground utilities within an area includes traversing the area with a plurality of underground utility sensors and obtaining area location data to locate the area traversed. The sensor data and area location data are used to map the location of one or more utilities within the area traversed. [A2000]

"Automotive lane deviation avoidance system"

A lane deviation avoidance system for an adaptive cruise control system equipped vehicle includes an electronic control unit that executes a host vehicle's lane deviation avoidance control in which a change in vehicle dynamic behavior occurs in a direction that avoids the host vehicle from deviating from a driving lane when there is a possibility of the host vehicle's lane deviation from the driving lane. The control unit puts a priority on the lane deviation avoidance control by limiting a driving force acting on the host vehicle, when there is the possibility of the host vehicle's lane deviation from the driving lane. [A2001]

"Millimeter-wave active imaging system"

Active millimeter-wave imaging systems can include an antenna apparatus configured to transmit toward and receive from a subject in a subject position, electromagnetic radiation. A controller can include a transceiver configured to operate the antenna apparatus and produce an output representative of the received radiation, and a processor adapted to convert the transceiver output into image data representative of an image of the subject. The antenna apparatus may move in a partial or continuous loop around the subject, toward or away from the subject, or in an opposite direction to an associated antenna apparatus. Antenna units in the antenna apparatus may be oriented at different angular positions along an array. Antenna arrays may also be formed of a plurality of array segments, and a group of arrays may be combined to form an antenna apparatus. [A2002]

"Object detecting device"

An object detecting device is provided whereby the number and size of detected objects can be determined without making the construction of the device more complex and the cost of components higher. The object detecting device includes multiple transmitter-receivers for transmitting radio waves and receiving reflected waves, each of the transmitter-receivers receiving both a reflected wave of a radio wave transmitted by itself and reflected waves of radio waves transmitted by other transmitter-receivers, a path-by-path reception distance computing unit for computing the path-by-path reception distance of every reflected wave and an object determination element for determining the number and/or size of detected objects based on the relationship between the reception distances computed by the path-by-path reception distance computing unit. [A2003]

"Ultra-wideband radar system using sub-band coded pulses"

Methods and apparatus are provided for radar systems using multiple pulses that are shorter than the expected range delay extent of the target to be imaged. In one implementation, a method for performing radar includes the steps of: transmitting a plurality of pulses, each pulse having a different center frequency and a time duration shorter than an expected range delay extent of a target, wherein a total bandwidth is defined by a bandwidth occupied by the plurality of pulses, receiving reflections of the plurality of pulses, and performing pulse compression on the received pulse reflections to generate a detection signal having a radar resolution approximately equivalent to the transmission and reception of a single pulse having the total bandwidth. In preferred form, the pulses comprise ultrawideband (UWB) pulses each occupying a sub-band of the overall system bandwidth. [A2004]

"Tangential velocity measurement using interferometric MTI radar"

Radar systems use time delay measurements between a transmitted signal and its echo to calculate range to a target. Ranges that change with time cause a Doppler offset in phase and frequency of the echo. Consequently, the closing velocity between target and radar can be measured by measuring the Doppler offset of the echo. The closing velocity is also known as radial velocity, or line-of-sight velocity. Doppler frequency is measured in a pulse-

Doppler radar as a linear phase shift over a set of radar pulses during some Coherent Processing Interval (CPI) . An Interferometric Moving Target Indicator (MTI) radar can be used to measure the tangential velocity component of a moving target. Multiple baselines, along with the conventional radial velocity measurement, allow estimating the true 3-D velocity of a target. [A2005]

"Method for target-tracking of objects"

A geographical region having an object to be tracked is divided into subregions, where adjacent disposed subregions partial overlap one another and the overlapping portions of adjacently disposed subregions share common states. A transition matrix is used to represent the terrain in a subregion and each subregion can have N geographical states and four (4) additional transition states. A regional tracker is used to estimate state sequences for each new observation of the object. Tracking continues until the process is complete or until the probability that the vehicle is in another new subregion occurs. Tracking performed between adjacently disposed subregions is based, at least in part by, the direction represented by the transition state. Tracking into a new subregion from an adjacently disposed old subregion begins precisely where tracking for the old subregion ended using the states that are common in the overlapping portions of the adjacently disposed subregions. [A2006]

"Ultrawide bandwidth system and method for fast synchronization using sub-code spins"

A UWB communication system and method for fast synchronization of one transceiver with another using the incoming UWB signal, where synchronization is achieved in less than a full code wheel spin. An exemplary embodiment includes a UWB waveform correlator, a timing generator, and a controller wherein the controller examines the correlator outputs as the code-wheel spins, and generates control signals to cause the timing generator to stop and track the incoming UWB signal whenever the incoming signal is received with sufficient SNR to provide a predetermined quality of service such as bit-error rate (BER) . This embodiment will in any case determine when the receiver has been substantially synchronized with an incoming signal, yet without an exhaustive search of the entire code-wheel. [A2007]

"Surface acoustic wave identification tag having enhanced data content and methods of operation and manufacture thereof"

A surface acoustic wave (SAW) identification tag and methods of operating and manufacturing the tag. In one embodiment, the tag includes: (1) a piezoelectric substrate having a SAW transducer located thereon, (2) a group of slots arranged by both pulse position and phase position on said substrate, and (3) a number of reflectors distributed among the slots such that the reflectors encode a number by both pulse position and phase position. [A2008]

"Wireless local area network (WLAN) channel radio-frequency identification (RFID) tag system and method therefor"

A wireless local area network (WLAN) radio-frequency identification (RFID) tag system provides location finding in a wireless local area network (WLAN) , using a WLAN channel. Interference with the WLAN is prevented by either using a sniffer circuit to determine that no network transmission is in progress, using a modified coding sequence or preamble to cause standard WLAN receivers to ignore the RFID tag transmissions, or transmitting a message using a standard WLAN signal addressed to an address not corresponding to a unit within the WLAN. Location units (LUs) and a master unit (MU) within the WLAN receive the RFID tag transmissions and can determine the location of a tag by triangulation based on differences between the signals received at the location units from the tag. The master unit receives the signal information from the location units and computes the location of the tag. Time-difference-of-Arrival (TDOA) , received signal strength indication (RSSI) or other triangulation techniques may be used. [A2009]

"Support system using data carrier system"

To provide a support system using a data carrier system by which an activity or a work operation by means of human beings and robots may be supported in a variety of environments. The support system comprises at least one tag being a data carrier that is disposed at a predetermined position, and at least one reader/writer that communicates with the tag, the tag being provided with an input/output means, a predetermined device being connected to the input/output means, and the predetermined device being operated by information output from the reader/writer. [A2010]

"Method and apparatus for remotely deriving the velocity vector of an in-flight ballistic projectile"

A system and method for rapidly determining the source of an incoming projectile applies controlled, active RF energy source (s) to illuminate a target area/projectile, and exploits Doppler induced frequency shifts from multiple receivers to develop a vector solution. The preferred solution applies continuous wave (CW) RF illuminators to flood a local region with a controlled source of radio frequency energy and one or more displaced receiver elements. The system operates multi-statically and as an incoming projectile enters the illuminated region, reflected energy from one or more illuminators is detected by one or more displaced RF receivers. Doppler shifts imparted on the reflected signals are detected by the receivers as the projectile moves through the region. Appropriate processing of the receiver outputs generates Doppler time-frequency profiles that are used to derive an estimate of the projectile flight vector in 3-space (x,y,z) . The vector parameters can, among other things, feed a laser designator that projects a beam along the derived flight path to support identification of the source, or be relayed to remote personnel by a data link where the projectile vector can be displayed on a map. [A2011]

"Radar device for detecting a distance and relative speed of an object"

A radar device includes a mixer that mixes an output of a transmit antenna 4 and an input of a receive antenna 6, an LPF 8, an A/D converter 9 that samples an output signal of the LPF 8 and subjects the sampled signal to A/D conversion, an FFT processing device 10 that subjects the converted signal to high-speed Fourier transformation, an aliasing discriminating/correcting device that discriminates a signal having a frequency component where aliasing occurs from a result by the FFT processing device 10 and corrects the signal to a signal of a normal frequency component where no aliasing occurs to obtain a distance and relative velocity data of the object, and a target object selecting device that selects necessary data from the distance and relative velocity data of the object which are obtained from the aliasing discriminating/correcting means. [A2012]

"Method for determining position and velocity of targets from signals scattered by the targets"

A method for determining position and velocity of targets from signals scattered by the targets using a first and a second station each including a transmitter/receiver of electromagnetic or acoustic signals. First, mono-static measurements are carried out from each station, and also a bi-static measurement between the stations. The two mono-static measurements are used to calculate a number of target candidates with 2-dimensional position and 2-dimensional velocity. These target candidates are tested against the result of the bi-static measurement and the target candidates which are found in all measurements with suitable error margins are retained. [A2013]

"Power monitor for radar system"

A method and corresponding devices for monitoring the performance of a radar system (2, 4) which is equipped with a shield 2 (radome) to protect it against weather influences are described. for this purpose, a part of the radiated radar signal is modified and fed as a monitor signal to the reception system after interacting with a coating (5) which is possibly present on the radom (2) . Influences of a damping or reflecting coating (5) on the radom (2) change the monitor signal. By analyzing these changes it is possible to draw conclusions about the coating of the damping or reflection of the radar signals which is caused by the coating (5) . [A2014]

"Method for operating a pre-crash sensing system in a vehicle having external airbags"

A pre-crash sensing system (10) for an automotive vehicle (50) is coupled to an external airbag system (120) . The external airbag system (120) may include a bumper airbag (126) , a grill airbag (122) or a bumper airbag and a grill airbag. An object classifier is used to generate an object classification signal. A controller (12) is coupled to the object classifier and the external airbag system for varying an activation level of the external airbag system (120) in response to the object classification signal. [A2015]

"Stool flushing device"

An object of the present invention is to provide a toilet cleaning device which is capable of cleaning a toilet stool by supplying cleaning water in an appropriate quantity corresponding to the state of usage by a user, which is provided with a self-diagnosis function for diagnosing cleaning water stoppage or the like, and which has a simple constitution so that maintenance can be performed easily. The output of a Doppler sensor 11 is amplified by an amp 31, and a frequency spectrum is determined by an FFT calculation portion 32. A flow rate is determined by conversion in a flow rate calculation portion 33 on the basis of the frequency spectrum. A controller 34 operates other devices on the basis of the flow rate calculated by the flow rate calculation portion 33 and the operational state of a cleaning instruction button 16. Cleaning water supply valve 36 is opened and closed in accordance with instructions from the controller 34. Electrolyzed water is generated in an electrolyzed water generating portion 38 to prevent the formation of urinary calculus in a drainpipe, and this electrolyzed water is discharged from a water spout when an electrolyzed water supply valve 39 is opened. [A2016]

"Method for identifying obstacles for a motor vehicle, using at least three distance sensors for identifying the lateral extension of an object"

In order to refine a method, as well as a system for detecting at least one object, in particular for detecting its specific parameters such as the relative position of the object or the relative speed of the object, such that the objects to be detected may be classified with respect to their spatial dimensioning, in particular with respect to their lateral extension, the spatial, in particular the lateral, extension of the object is detected using at least three distance-resolving units, mounted in particular on a means of transportation. [A2017]

"Encoding and decoding ultra-wideband information"

A system and a method for encoding and decoding ultra-wideband information are provided. An ultra-wideband transmission is encoded by positioning bipolar pulse pairs. The bipolar pulse pairs assist in detecting errors in the ultra-wideband transmission, before the entire transmission has been received. The transmission is analyzed for errors and an error rate is calculated. The calculated error rate is compared to one or more predefined acceptable error rate levels to determine whether the calculated error rate of the transmission is within at least one of the predefined acceptable error rate levels. [A2018]

"Transponder, including transponder system"

In a transponder (19) for amplification of a received signal (60) into an antenna (1) , to a signal (61) for retransmission, and where the retransmitted signal (61) possibly may have information superimposed, a quenched oscillator (5) is incorporated as amplifying element. The oscillator (5) is preferably of superregenerative type and exhibits negative resistance (30) for the received signal (60) . Transponders according to the present invention may be introduced as system elements in a wireless or wire based network to work as intelligent or unintelligent connections in the network. The transponders can also be used in positioning systems. [A2019]

"Method for operating a driver support system for motor vehicles"

A support of the operator of the motor vehicle is to be provided in all traffic situations in a simple manner and with low costs, without overburdening the operator of the motor vehicle. In this context, in the following or tracking operation, in which a regulation of the speed of the motor vehicle dependent on the spacing distance to detected target objects that are classified as relevant is carried out, the relevant target objects used for the speed regulation are selected by the operation of an operating element to be operated by the operator of the motor vehicle. [A2020]

"Adaptive vehicle safety system for collision compatibility"

A safety system for a host vehicle includes a pre-crash sensing system generating host vehicle dynamics data, a target vehicle threat assessment, and target vehicle bumper or doorsill location data. A ride-height, Dynamic State Self-Turning (DSST) controller generates a reference ride-height signal as a function of the host vehicle dynamics data, target vehicle threat assessment, and target vehicle bumper or doorsill location data. A Rule-Based Height Regulator (RBHR) controller is feedback communication with an adjustable suspension system, is programmed to continuously adjust the host vehicle ride-height with reference to the ride-height signal, and the host vehicle bumper location to optimize the collision conditions between the two vehicles until just prior to impact. [A2021]

"Integrated collision prediction and safety systems control for improved vehicle safety"

A control system for an automotive vehicle (50) has a radar or lidar system (22) used to generate a remote object signal. A vision system (26) confirms the presence of the target object in the detection zone. A controller (12) is coupled to the remote object sensor and a vehicle dynamics sensor and the brake system. The controller predicts a host vehicle trajectory in response to the host vehicle dynamic signal, determines an azimuth angle for the target object, determines an actuation value in response to the target range signal, the target relative velocity signal, the host vehicle trajectory, host vehicle brake system status and the target azimuth angle. The controller (12) activates a countermeasure in response to the actuation value. [A2022]

"Length measurement with radar"

In a method for determination of the length of objects in traffic, especially passenger cars, trucks, buses, motorbikes, bicycles and pedestrians, radar signals are transmitted by a vehicle, the radar signals are reflected by an object being measured, the reflected radar signals are received in the vehicle, the frequency spectra of the reflected radar signals are evaluated, and the reflection peaks contained in the frequency spectra are determined. Length measurement, by means of known radar sensors, from a vehicle is made possible by the fact that the width of the reflection peaks is determined, and that the length of the object being measured is determined by means of the determined width. [A2023]

"Device for searching a parking space"

A device for detecting parking spaces for vehicles includes a distance-measuring beam-type sensor system disposed on a road vehicle, and a signal processing system. The distance-measuring beam-type sensor system directs a measuring beam into an area in front of the vehicle so as to detect free areas in the traffic space that are potential parking spaces. The signal processing unit examines, upon a detecting of a free area, the dimensions of the free area and the suitability of the free area for parking. [A2024]

"Combined radar and laser detector having GPS receiver and using wireless communication"

The present invention relates generally to a combined radar and laser detector that enables a driver to drive safely and, more particularly, to a combined radar and laser detector, in which a signal receiving module for receiving various kinds of signals including traffic information and an information display module for informing a driver of the signals are separated, the signal receiving module and information display module are constructed to communicate with each other using wireless communication, and the information display module is integrated with a Global

Positioning System (GPS) receiver detecting GPS data related to the location and speed of a moving vehicle, so that the combined radar and laser detector can not only provide accurate traffic information to the driver, but also allow the installation thereof to be easy, the miniaturization thereof to be achieved, and power consumption to be minimized. [A2025]

"Occupant restraint device control system and method"

Control system for controlling an occupant restraint device effective for protection of an occupant of the seat including a receiving device arranged in the vehicle for obtaining information about contents of the seat and generating a signal based on any contents of the seat, a different signal being generated for different contents of the seat when such contents are present on the seat, an analysis unit such as a microprocessor coupled to the receiving device for analyzing the signal in order to determine whether the contents of the seat include a child seat, whether the contents of the seat include a child seat in a particular orientation and/or whether the contents of the seat include a child seat in a particular position, and a deployment unit coupled to the analysis unit for controlling deployment of the occupant restraint device based on the determination by the analysis unit. The analysis unit can be programmed to determine whether the contents of the seat include a child seat in a rear-facing position, in a forward-facing position, a rear-facing child seat in an improper orientation, a forward-facing child seat in an improper orientation, and the position of the child seat relative to one or more of the occupant restraint devices. [A2026]

"Method and apparatus for ultra precise GPS-based mapping of seeds or vegetation during planting"

An ultra precise seed planter apparatus and method for generating a centimeter accuracy map of the location of seeds or vegetation as they are planted from an agricultural planting machine. The apparatus is fitted with a GPS receiver feeding a data logger, and optical sensors that are placed adjacent seed or vegetation dispenser. The data logger monitors GPS time and UTM coordinates, as well as the optical sensors. Ground speed and azimuth are also monitored. The seeds or vegetation are time-tagged as they are dispensed, and software is used to process the dispensing time and GPS location data and estimate the exact coordinates of each seed or plant and its distance from adjacent seeds or plants. As a result, a precise planting map is generated. The invention may also be used to determine the location to dispense seeds or vegetation, and activating the dispenser when that location is reached. [A2027]

"Cruise control apparatus performing automatic adjustment of object recognition processing in response to driver actions relating to vehicle speed alteration"

A cruise control apparatus can control a host vehicle to run with a fixed separation from a preceding vehicle when such a preceding vehicle is detected based on received radar signals and to run at a preset fixed speed when no preceding vehicle is detected. The cruise control apparatus is configured to respond to one of a set of predetermined actions by the vehicle driver, which indicate an intention to change the vehicle speed, by making it easier or more difficult for a preceding vehicle to be detected, in accordance with whether the indicated intention may signify that an actual preceding vehicle is not being detected or may signify that a non-existent preceding vehicle is being detected and that the host vehicle speed has been reduced accordingly. Improved performance is thereby achieved by utilizing the cognitive abilities of the driver to augment the detection operation of the cruise control apparatus. [A2028]

"Measurement controller for vehicle"

A measuring and controlling apparatus for a vehicle includes an image processing device, which is mounted on a vehicle, photographs a circumferential state of the vehicle and processes the image signal, a radar signal processing device, which radiates radio wave or light to process a receiving signal, and a control device for controlling a brake, a throttle valve or a transmission based on the output results of the image processing device and the radar signal processing device. In such a measuring and controlling apparatus for a vehicle, the respective output information of the image processing device and the radar signal processing device includes time information at the time of photographing and time information at the time of measuring and the order of the photographed time and the measured time are adjusted. Thus, even if the processing time differs between the cases where a subject to be photographed is simple and complicated, since the photographed time and the measured time can be identified, the suitable processing according to the processing time can be executed. Thus, the running state of the vehicle can be controlled with high accuracy. [A2029]

"Method and device for ascertaining the imminence of an unavoidable collision"

A method and a device for ascertaining the imminence of an unavoidable collision of a vehicle with an object, all locations within a determinable prediction time interval being predetermined as a function of the maximum possible longitudinal acceleration and lateral acceleration of the vehicle and of the at least one object. The imminence of an unavoidable collision between the vehicle and the object may be recognized, also taking into account the extension of the vehicle and of the at least one object. [A2030]

"System and methods for obtaining ground conductivity information using GPR data"

A method for inferring information about the conductivity of a medium from ground penetrating radar (GPR) data using a calculated effective penetration limit of the GPR system, including various methods for calculating the effective penetration limit. [A2031]

"Method and apparatus for object detection and ranging"

A method and apparatus for object detection and ranging is disclosed. A returned signal is sequentially received by one of several sensors mounted on a host vehicle. Each one in turn initiates successive sampling to collect a series of returned signal values, which are then compared with corresponding threshold values previously saved in a memory device to determine whether any object is in the way of the vehicle backing up and also to estimate the relative distance from the object. The control circuit in accordance with the invention includes a processor, which together with a channel selector establishes a sequence of signal transmission and reception each time by one of several sensors. A sampled signal is first passed through and A/D converter to become digital, and then it is input to the processor for object detection and ranging computation. [A2032]

"Mapping radio-frequency noise in an ultra-wideband communication system"

A system and method for mapping radio-frequency (RF) noise, and estimating channel quality in a multi-channel ultra-wideband communication system is provided. One method includes placing a plurality of time bins within a plurality of time frames and assigning a plurality of UWB communication channels comprising selected time bins. RF noise amplitude data is then sampled from selected time bins. The sampled RF noise amplitude data from the time bins is then averaged, thereby obtaining an average RF noise amplitude in each of the plurality of channels. The RF noise amplitude indicates the amount of RF noise present in a channel. The channels may then be ranked based on the characteristics of the RF noise. [A2033]

"Rain versus target discrimination for doppler radars"

A method of removing returns from rain in Doppler radar systems (and corresponding apparatus and computer software) comprising receiving a Doppler radar return signal, transforming the signal into a range versus frequency map, for a plurality of range cells, performing a fit over frequency, for the plurality of range cells, calculating a total energy, for the plurality of range cells, comparing the calculated total energy to a threshold value, and replacing the return signal for a range cell with another signal if for the plurality of range cells the comparing step is positive. [A2034]

"Object detecting method and object detector"

Beams are irradiated in three directions by switching an irradiation direction of a mainlobe of an antenna by stages, and an echo is received from a detection object obtained in the mainlobe or a sidelobe in each irradiation direction. Then, reflection power intensity in each irradiation direction is found from the received echo, and pattern of relative variation of the reflection power intensity (power intensity pattern) in each irradiation direction is generated. Meanwhile, a detection region is divided into seven bearings "c" to "i" and a power intensity pattern when an object exists in each bearing is previously stored as a reference pattern in each bearing. Then, the bearing in which the detection object exists is specified by comparing the power intensity pattern obtained from the received echo with the reference pattern in each bearing. [A2035]

"Sector antenna apparatus and vehicle-mounted transmission and reception apparatus"

A sector antenna apparatus mounted on a vehicle has a casing, in which six horn antennas having apertures over an angular range of 180 degrees and extending radially are accommodated. The proximal ends of the horn antennas are connected to an antenna changeover switch. A portion of the horn antennas which emits beam radiation in the forward and backward direction and diagonal direction of the vehicle have large apertures, and a portion of the horn antennas which emits beam radiation to the right and left of the vehicle have a small aperture. Thus, the required antenna characteristics, such as angular resolution, beam width, antenna gain, are achievable in the required direction. [A2036]

"Method and device for aligning radar mount direction, and radar aligned by the method or device"

A radar mount direction alignment device to be used for aligning the transmit/receive direction of a radar device 2D mounted on a member on which a radar device is to be mounted, such as a vehicle 1. The radar mount direction alignment device has receiving sections b9, b10 for receiving a signal emitted from the radar device 2D, and transmission sections a9, a10 for transmitting a signal to the radar device 2D. The radar mount direction alignment device has the function of emitting, toward the radar device 2D, a signal which, upon receipt of a signal output from the radar device 2D, behaves as if having been received at and reflected from a position farther from the radar device 2D than a distance between the radar device 2D and the radar mount direction alignment device. [A2037]

"Transponder and antenna"

An antenna for a transponder comprises a magnetic core composed of layered amorphous metallic thin plates or composite plates of soft magnetic flakes and a synthetic resin, and a coil wound on the magnetic core. A transponder comprises two antennas set forth above, and a spiral antenna. [A2038]

"Passive moving object detection system and method using signals transmitted by a mobile telephone station"

A passive object detection system (1) comprises first and second antennas (4, 6) and a processor (8) . The first antenna (4) is adapted to receive a signal transmitted by a mobile telephone base station, the second antenna (6) is adapted to receive the signal transmitted by a mobile telephone base station (2) after it has been reflected off an object (3) and the processor compares the signal received from the mobile telephone base station with the signal reflected from the object to derive speed or position information relating to the object therefrom. [A2039]

"Method and device for determining the level of a filling in a container"

The invention relates to a method and a device for determining the level of a filling (1) in a container (2) . The aim of the invention is to provide a method and a device for measuring said level which are economical to carry out/produce and which offer an especially high degree of measuring accuracy. To this end, the inventive method provides that transmit signals are sent in the form of a first binary-weighted pulse sequence of transmit pulses with a predetermined pulse repetition duration (.tau..sub.R) and a predetermined pulse sequence length (L) in the direction of the surface (3) of the filling (1) , and the echo signals of the transmit pulses reflected on the surface (3) of the filling (1) are sampled with a second, preferably continuous sequence of sampling pulses of the pulse repetition duration .tau..sub.R, the second pulse sequence being delayed (.tau..sub.S) in relation to the first pulse sequence and the components of the sampling values that correspond to the echo signals with a propagation time of .tau.=.tau..sub.S being retained while components that correspond to echo signals with a propagation time of .tau..sub.S < .tau.< .tau..sub.S +L.multidot..tau..sub.R are deleted. The level of the filling (1) in the container (2) is determined using the weighted sampling values. [A2040]

"Object recognition apparatus for vehicle, and inter-vehicle distance control unit"

In an object recognition apparatus using a radar unit for a vehicle, in mounting the radar unit on the vehicle, a transmission wave is outputted throughout an appropriate angular range in a forward direction of the vehicle in a state where a margin is given to a tolerance of the mounting angle of the radar unit on the vehicle. Laser beams are radiated at a target placed at a predetermined positional relationship relative to the radar unit mounted on the vehicle to extract a laser beam which provides the maximum light-reception intensity in each of the X-axis and Y-axis directions. Moreover, a predetermined angular range is set in each of the X-axis and Y-axis directions so that the laser beam which provides the maximum light-reception intensity is centered therein, and the predetermined angular range is used as a recognition area. [A2041]

"Remote control systems with ambient noise sensor"

A remote control system includes a remote control transmitter that transmit a signal and a receiver than can receive the signal from the transmitter. A control device performs a function having a first and a second option. The control device responds to the signal received by the receiver and performs the first option if the distance between the remote control transmitter and the receiver is greater than a particular distance and performs a function based on the ambient noise level. [A2042]

"Blind spot detector system"

A blind spot detector system adapted to the exterior of a vehicle comprising at least one infrared light emitting diode (LED) , an infrared photodetector and demodulator, and a microcontroller. The output power of the infrared transmitter is linearly modulated, enabling the blind spot detector to determine the proximity of the detected object. Furthermore, the transmitter output is frequency modulated to screen out random infrared radiation that might adversely affect the operation of the infrared photodetector. The system is calibrated to the position of the attached vehicle by linearly increasing the output power of the transmitter until the rear quadrant of the vehicle is detected when the transmitter is outputting power at a pre-determined calibration level. During normal operation, an object detected while the transmitted power is greater than a predetermined lower threshold and less than the calibration level will activate a LED indicator on the system housing. [A2043]

"Object detection by signal field mapping"

An object detection system includes an emitter, a receiver, and a controller adjacent a window assembly which typically includes a moveable glass member and a frame. In operation the emitter transmits the electromagnetic through a defined field adjacent a closure path of a moveable glass member. The controller constructs a map of the signal received by the receiver such that insertion of an object within the defined field produces a variation in the map. The controller halts or reverses the movement of the moveable glass member to prevent trapping the object between the closing moveable glass member and the frame. [A2044]

"Automotive system including a back-up aid with parking assist"

A technique for combining a back-up aid function with a park assist function in a motor vehicle initially includes determining a distance from a motor vehicle to an object. Next, a velocity of the motor vehicle is determined. Then, a scaled version of the velocity and a minimum distance threshold are subtracted from the distance to provide a first multiplicand. Finally, a driver stimulus is provided as a function of the first multiplicand. [A2045]

"Ultrawide bandwidth system and method for fast synchronization"

A system and method for fast synchronization of an incoming signal with a UWB receiver. The present invention synchronizes a UWB receiver with an incoming signal. The present invention correlates a local pulse generated at the receiver with the incoming signal, finds the value in the correlation function that would correspond to a high signal to noise ratio, thereby matching the receiver to the incoming signal phase, and operates the receiver at that phase. Exemplary options of fast synchronization include a maximum peak detector. [A2046]

"Spread spectrum base station"

A spread spectrum remote unit produces a message signal having message data. A reference signal is produced. The reference signal is used to recover the message data from a combined spread spectrum signal. The reference signal and the message signal is combined as a combined signal. The combined signal is transmitted as the combined spread spectrum signal. [A2047]

"Clutter rejection in a passive radar receiver of OFDM signals"

The invention concerns a passive radar receiver for a received orthogonal frequency division multiplex-type signal consisting of symbol frames each emitted on coded orthogonal carriers. After formatting the received signals into digital symbols (S.sub.1 S.sub.1) , a filtering circuit (2) eliminates by subtraction or using a covariance matrix, in the symbol signal at least unwanted signals with null Doppler effect so as to apply a filtered signal (X') including essentially signals backscattered by mobile targets to a Doppler-distance correlator (4) . [A2048]

"Impulse radar antenna array and method"

An antenna array comprising a ground plane and a plurality of elements mounted thereon, said elements being capable of emitting and receiving ultra wideband emissions. Elements are arrayed on the ground plane in two parallel rows, a transmitting row, and a receiving row, such that a given element in the receiving row is aligned in at least one direction with a corresponding element in the transmitting row. Additionally, the elements are configured on the ground plane to elicit a symmetrical product response in the azimuthal plane, and to produce horizontally polarized signals. An alternative embodiment places the elements with unique inter-element spacing within the rows. An embodiment comprises a fence structure between rows. A method for use comprises the step of transmitting a signal via an element in the transmitting row and receiving said signal through an element in the receiving row, not aligned with the transmitting element. [A2049]

"System and method for distance measurement by inphase and quadrature signals in a radio system"

A system and a method for distance measurement utilizes a radio system. The distance is measured in coarse resolution, and in fine resolution that corresponds to distance attributes. The distance between first and second radio transceivers is determined from the coarse distance and the fine distance attributes. [A2050]

"Method and apparatus for short-term prediction of convective weather"

A method and apparatus for forecasting the likely occurrence of convective weather events, such as thunderstorms. An image filter is used to identify areas of interest within a meteorological image that are likely to contain convective weather. The image filter and an image difference processor identify areas within the meteorological image that are likely to experience a growth and/or decay of weather events. The meteorological image, interest image and growth/decay image are processed to produce the short-term forecast. [A2051]

"Electronic key device for vehicle and starting control method for vehicle"

An electronic key device for a vehicle which performs starting of the vehicle by performing ID verification against a portable electronic key unit includes an ID verification device, a decision device, and a vehicle starting control device. When the number of times that the result of ID checking by the ID verification device is negative and also the portable key unit is not present within the vehicle arrives at a predetermined value, a locked mode is set in which thereafter starting of the vehicle is prohibited unless a predetermined procedure is performed. When the result of ID checking by the ID verification device is affirmative and the portable key unit is not present within the vehicle, then no such predetermined number of times calculation for setting the locked mode is performed. [A2052]

"Method and apparatus for deploying airbags"

Apparatus and method for deploying airbags in a vehicle in which a first inflatable airbag protects an occupant in a seating location during a crash and a second inflatable airbag moves the occupant in the seating location away from an interior surface of the vehicle upon inflation. A crash sensor system determines that a crash involving the vehicle will occur or is occurring and initiates inflation of the first and second airbags. The second airbag may be inflated prior to inflation of the first airbag such that inflation of the second airbag causes the occupant to be moved away from the interior surface of the vehicle and into a better position for deployment of the first airbag. In one exemplary embodiment, the first airbag is a side curtain airbag and the second airbag is arranged in a door of the vehicle to move the occupant away from the door. [A2053]

"Image formation by passive collection and processing of radio frequency signals illuminating and scattered by cultural features of terrestrial region"

An imaging system uses `RF daylight` created by an RF illumination source, such as a television broadcast tower, to passively generate RF scattering coefficients for multiple points within a prescribed three-dimensional volume being illuminated by the RF transmitter. The scattering coefficients provide a complex interference pattern having amplitude and phase components that contain all information necessary to recreate a three-dimensional monochromatic image of the illuminated scene. Coherent complex correlation provides scene information content that is only a function of scene scattering and collector geometry. The scene information may be coupled to an image utility subsystem, such as a virtual reality simulator, for generation of a three-dimensional image of the illuminated scene. [A2054]

"Spread spectrum remote unit"

A spread spectrum remote unit produces a message signal having message data. A reference signal is produced. The reference signal is used to recover the message data from a combined spread spectrum signal. The reference signal and the message signal is combined as a combined signal. The combined signal is transmitted as the combined spread spectrum signal. [A2055]

"Vehicle collision severity estimation system"

A collision severity estimation system (10) for an automotive vehicle (12) is provided. The system (10) includes one or more object detection sensors (22) detecting an object and generating a first object detection signal. A controller (20) is electrically coupled to the object detection sensors (22) and determines motion properties of the object relative to the vehicle (12) and generates an object motion signal in response to the first object detection signal. The controller (20) determines potential collision severity between the vehicle (12) and the object in response to the object motion signal and generates a collision severity signal. Methods of determining motion properties of the object as well as determining potential collision severity between the vehicle (12) and the object are also provided. [A2056]

"Ultra wideband signals for conveying data"

A method for conveying application data via carrierless ultra wideband wireless signals, and signals embodied in a carrierless ultra wideband waveform. Application data is encoded into wavelets that are transmitted as a carrierless ultra wideband waveform. The carrierless ultra wideband waveform is received by an antenna, and the application data is decoded from the wavelets included in the waveform. The waveforms of the signals include wavelets that have a predetermined shape that is used to modulate the data. The signals may convey, for example, Web pages and executable programs between mobile devices. The signals are low power and can penetrate obstructions making them favorable for use with a wireless node of a network. [A2057]

"Active element array apparatus for displaced phase center systems"

A synthetic aperture side looking sonar system which includes an array of active elements, which provide output signals in response to acoustic reflections received from a target area, during travel over the target area. The array has a first section of elements, the output signals of which are used to obtain target information. The array additionally has a second section, including space apart transducers, the output signals of which are used exclusively to determine yaw and sway of the system, as it travels over the target area. Signal processing circuitry, using displaced phase center principles, is provided, and is responsive to the element output signals to derive yaw and sway correction signals for synthetic aperture beam formation. [A2058]

"Method and apparatus for directly digitizing microwave signals"

Described is a method and an apparatus of directly digitizing microwave signals reflected at a filling product surface of a filling product present in a receptacle, in which method the microwave signals reflected at the filling product surface are sampled unmodified in their frequency, and the therefrom resulting analog values are converted into digital values, with successive digital values being stored in various intermediate memories, and the intermediately stored digital values are read out from the intermediate memories and are stored in a terminal memory unit, to which accesses an evaluation arrangement which determines the filling level height. [A2059]

"Method for controlling deployment of an occupant protection device"

Method for controlling a vehicular component based on the position and velocity of an occupant in which the current position and velocity of the occupant are determined, an expected position of the occupant is determined based on the current position and current velocity of the occupant and the component is controlled in consideration of the expected position of the occupant. If the component is a deployable occupant protection device, deployment can be suppressed if the expected position of the occupant is not in a predetermined acceptable position for deployment of the occupant protection device, i.e., the occupant is out-of-position. The position and velocity can be determined several times after the start of the crash and prior to deployment of the occupant protection device so as to enable continual adjustment and control thereof based on the most recent position and velocity of the occupant. The position and velocity of the occupant can be determined using a wave transmitter/receiver arrangement. The velocity of the occupant can be determined from successive position measurements. [A2060]

"Hand-off between ultra-wideband cell sites"

Briefly, the present invention provides a dynamic channel re-assignment capability between mobile units, base stations and sectors within base station coverage areas. The wireless devices used in the present invention may include impulse radio communication devices such as, for example ultra-wideband radio (also known as digital pulse wireless) communication devices. Ultra-wideband bandwidth and channel allocation can be effectively managed, even though link quality generally deteriorates near the outer boundary of the base station. By maintaining dual communications with an adjoining base station, the present invention reduces the bit error rate and maintains signal strength (e.g., RF signal strength) . This procedure is termed a "soft-handoff". [A2061]

"Object-detecting system for vehicle"

In an object-detecting system using an FM-CW wave, points f1 to f4 corresponding to detection peaks of a reflected wave from a road-side object such as guardrail and points m1 and m2 corresponding to detection peaks of a reflected wave from a moving object such as a reflector of a preceding vehicle are indicated on two-dimensional coordinates along with the shape of a road ahead of a subject vehicle. Among the points f1 to f4, m1 and m2, the points f1 to f4 are determined as being provided by the reflected wave from the road-side object, and a distance from the subject vehicle to the object and a speed of the subject vehicle relative the object are calculated using the remaining points m1 and m2 excluding the points f1 to f4. Thus, only the moving object except the road-side object can be detected. [A2062]

"Motor vehicle warning and control system and method"

A system and method assists the driver of a motor vehicle in preventing accidents or minimizing the effects of same. In one form, a television camera or other ranging device is mounted on a vehicle and scans the roadway ahead of the vehicle as the vehicle travels. Continuously generated video picture signals output by the camera are electronically processed and analyzed by a fuzzy-logic-based image analyzing computer mounted in the controlled vehicle, which generates control signals and applies them to control the operation of the accelerator, brake, and steering system of the vehicle in a coordinated way to attempt to avoid or lessen the effects of a collision. In a particular form, the decision computer may select the evasive action taken from a number of choices, depending on whether and where the detection device senses other vehicles and obstacles. Warning signals may also be generated. [A2063]

"Occupant protection system for vehicle"

An occupant protection system of the type of predicted rear-end collision adaptive control raises an alarm when a rear-end collision is predicted and activates a belt tensioning motor to strain a safety belt so as to restrain the occupant strongly against the back of a seat at a point of time specified seconds before a possible occurrence of the predicted rear-end collision. In specific running situations such as cornering a sharp bent lane and making a right or left turn where the occupant protection system possibly confuses a stationary traffic device with a following vehicle, the occupant protection system is prevented from raising an alarm of a possible rear-end collision and straining the safety belt. [A2064]

"Vehicle radar apparatus"

A vehicle radar system extracts peak frequencies fbu and fbd of respective beat signals B1 to B9 representing the frequency difference between a transmission signal fs and a plurality of received signals fr1 to fr9. The phase difference of respective beat signals B1 to B9 at the peak frequencies fbu and fbd is converted into a frequency signal. In the case of reflection from a close range road surface or raindrops, the phase difference of each beat signal is irregular. The peak frequency intensity of a converted frequency signal is small. This system compares the peak frequency intensity of the converted frequency signal with predetermined criterion intensity. Then, the system identifies an objective with a close range road surface or raindrops when the peak frequency intensity of the converted frequency signal is not larger than the predetermined criterion intensity. [A2065]

"Collision prediction device, method of predicting collision, and computer product"

An image sensor section and a millimeter-wave sensor section separately detect objects. A sensor matching section determines whether the objects detected by the image sensor section and the millimeter-wave sensor section are one and the same object. If the objects are one and the same object, the sensor matching section estimates a position of the obstacle after a certain period. A collision prediction section determined whether there is going to be a collision between the vehicle and the object 50 from the position estimated by the sensor matching section. [A2066]

"Automotive radar systems"

An automobile radar which serves to provide data for cruise control or other systems in a host vehicle, comprising means for measuring radar boresight misalignment by detecting the presence of apparent variations in the spacing of stationary objects from the direction of motion of the host vehicle and utilizing such detection to compensate for any misalignment. [A2067]

"Acoustic pulse echo ranging system"

A method of operating a pulse echo ranging system comprising a transducer assembly for providing transmission and reception of high frequency energy pulses at substantially different plural frequencies. The method uses signals received by the transducer assembly to generate an echo profile for signals received at at least a first of the frequencies to enhance the recovery of data beyond that obtained from the first signal alone. [A2068]

"Apparatus for shaping the radiation pattern of a planar antenna near-field radar system"

A near-field radar apparatus includes a fixed beam planar radar antenna and a radiation pattern adaptation device disposed substantially at the near-field boundary of the antenna. The adaptation device comprises a plurality of dielectric elements that individually constitute or approximate different surface portions of an idealized quasi-spherical or quasi-cylindrical radome reflector. The dielectric elements can be maintained physically separate or combined about the diffraction point of the antenna to form a single dielectric element. The dielectric elements may be mounted on a radome that is otherwise transparent to the radiation pattern, or otherwise suspended at or near the near-field boundary of the antenna. [A2069]

"Road surface detection apparatus and apparatus for detecting upward/downward axis displacement of vehicle-mounted radar"

A road surface detection apparatus capable of detecting an upward/downward displacement in radar axis when detecting a road surface by projecting a radar beam. The apparatus projects a radar beam signal onto the road surface on which the radar-equipped vehicle is traveling, and receives a signal containing a reflected signal of the radar beam signal. Then, the apparatus compares the level of the road surface reflected signal contained in the received signal with a predetermined reference level and, if the result of the comparison lies outside a predefined range, then the apparatus determines that the axis defining the projection direction of the radar beam signal is displaced. [A2070]

"Coal bed methane borehole pipe liner perforation system"

A coalbed methane borehole pipe liner perforation system comprises a plastic pipe punch that slips down inside a coalbed methane production borehole lined with a non-perforated plastic pipe. A ground-penetrating radar is used inside the plastic-pipe lined borehole to determine which sections of the pipe are in contact with groundwater. The punch is then operated along the length of the plastic-pipe lined borehole to perforate it for methane-gas collection wherever such groundwater is not present. A radar survey to determine groundwater contact can be made simultaneously in combination with the punching of liner pipe perforations, or earlier in a separate operation. [A2071]

"Sensor fusion system architecture"

A sensor system for generating information useful for determining the environment surrounding a vehicle includes multiple sensing zones, with each zone using sensors operating in different electromagnetic bands. The outputs of the sensors are fused to provide more useful information than that obtainable from either sensor, taken alone. [A2072]

"Method for recognizing a change in lane of a vehicle"

A method of detecting a lane change of a subject vehicle (20) , having a locating device (10) which uses angular resolution for locating vehicles (VEH1, VEH2, VEH3) traveling in front, and a device (44) for determining the yaw rate (.omega..sub.0) of the subject vehicle. The angular velocity (.omega..sub.i) of at least one vehicle traveling in front relative to the subject vehicle (20) is measured using the locating device (10) , and a lane change signal (LC) indicating the lane change is formed by comparing the measured angular velocity (.omega..sub.i) to the yaw rate (.omega..sub.0) of the subject vehicle. [A2073]

"Collision avoidance control system for vehicle"

A collision avoidance control system for a vehicle is provided which is designed to determine a target collision avoidance deceleration required for a system vehicle equipped with this system to bring a relative speed between the system vehicle and a target object into agreement with substantially zero without a physical collision with the target object and to determine a possibility of collision with the target object as a function of the target collision avoidance deceleration. When the possibility of collision is higher than a given threshold level, the system starts to decelerate the system vehicle. This enables the avoidance of collision with the target object at a decreased operation load on the system. [A2074]

"Vehicle surroundings monitoring apparatus"

Distance image outputted from an image processor is read by a recognition/judgment computer, in which the distance image is divided into strips having a specified interval and a histogram is prepared for each strip. Based on the histogram, the position of solid objects and the distance thereto are obtained and these positional data of the solid objects are classified into groups of solid object and groups of side wall. Further, the position of a wall surface forming a boundary of a road is detected from the data of the groups of side wall. On the other hand, assuming a wall surface model composed of a series of nodes, respective nodes are determined and corrected by the data of side wall. Thus obtained nodes form a successive wall surface along a curved road. [A2075]

"Method for determining object type of reflective object on track"

A plurality of reflective points in front of one's vehicle in a traveling direction are detected by a radar device. The plurality of detected reflective points are grouped based on a predetermined standard, and the grouped reflective points are regarded as detection objects. Relative speeds of the detected detection objects are measured with respect to one's vehicle. Types of the detection objects are determined based on the measured relative speeds. [A2076]

"FMCW radar system"

An inventive frequency modulated continuous wave (FMCW) radar system realizes both a quick detection of a higher relative speed provisional target and a sure detection of a smaller relative speed provisional target. The number of detection cycles used for a paring validity check, used to see if a detected target or a pair of frequencies is an actual target or a pair for an actual target, is set in response to the relative velocity enabling the target information for a target of higher relative velocity to be output more quickly. [A2077]

"Radar"

A radar for a terminally-guided sub-munition is capable of differentiating between spatial depositions of target scatterers and clutter. The radar frequency f is swept, in stepwise manner, over a frequency range F, the frequency of 2N successive batches of M pulses being incremented in steps of ##EQU1## To minimise variability of hybrid spectrum with relative target velocity, v, a duplexer transmits the 2 NM pulses with a monotonic frequency sequence derived from control circuit and the returns being reordered. [A2078]

"Pulse-radar method and pulse-radar sensor and system"

In a pulse-radar method, in particular for motor vehicles, different time slots of a time frame are predefined. During one time slot, a radar sensor emits at least one radar pulse and receives the echo signal (s) . During the remaining time slots the radar sensor monitors whether interference signals occur. On the basis of the interference signals occurring per time slot, a decision is made whether the radar sensor should continue its transmitting and receiving operation in the predefined time slot or should switch to one of the remaining time slots of the time frame. The method is suited for the concurrent operation of a plurality of radar sensors, without this causing interference. [A2079]

"Apparatus and method for horizontal drilling"

An apparatus and method for horizontally drilling provides for detecting subsurface features and avoiding such features during closed-loop control of an underground drilling machine. A horizontal drilling system includes a base machine capable of propelling a drill pipe rotationally and longitudinally underground. A cutting tool system is coupled to the drill pipe, and a control system controls the base machine. A detector is employed to detect a subsurface feature. A communication link is utilized for transferring data between the detector and the control system. The control system uses the data generated by the detector to modify control of the base machine in response to detection of the subsurface feature. [A2080]

"Vehicular exterior identification and monitoring system-agricultural product distribution"

A vehicle including a ground speed sensor arranged to detect the speed of travel of the vehicle on the ground and including a wave transmitter arranged to transmit waves toward the ground, a wave receiver arranged to received waves reflected from the ground and a processor coupled to the transmitter and receiver to determine the speed of travel based on the transmitted waves and received waves. The waves are transmitted in pulses or modulated such that the processor is able to determine the distance between a wave-transmission and reception point and the ground (by time of flight for ultrasonic and electromagnetic waves or phase difference-for electromagnetic waves) and the velocity of the vehicle (using Doppler analysis) . [A2081]

"Vehicle-mounted radio wave radar"

An antenna base, a control circuit section, and a high-frequency circuit section are enclosed in an inner space defined by a housing and a radome. Inside this inner space, the control circuit section and the high-frequency circuit section are surrounded by the antenna base and the housing. A circuit GND common to the control circuit section and the high-frequency circuit section is electrically connected to the antenna base and the housing, and it is connected to a body GND through only capacitive impedance. [A2082]

"Method and apparatus for accessing medical asset data"

A wireless communication system to obtain data from a medical asset, such as mobile equipment. The system utilizes a transmitter coupled to a programmable interface. The programmable interface is, in turn, coupled to a device associated with the asset. The device or application communicates data about the asset to the interface. The interface is programmed by a user to communicate with the device and couple the data to the transmitter in a configuration selected by the system user. The transmitter is operable to transmit the information to one or more antennas of the wireless communication system. The information from the antennas is coupled to a cell controller and to an information system. [A2083]

"Radio-frequency imaging system for medical and other applications"

An imaging system for medical and other applications in which the internal structures of an overall object must be seen without invading or damaging the object. The system works by transmitting electromagnetic waves of single or a multiplicity of frequencies through the object (for example the human body) and measuring the absorption and scattering of these waves by the various structures and inhomogeneities of the object, using scanning sub-wavelength resolution detectors. [A2084]

"Enhanced adaptive weather thresholds for identification of hazards system and method"

A weather radar display system is disclosed. The weather radar display system comprises a weather radar antenna, processing electronics, coupled to the weather radar antenna, enhancing weather radar returns based on a reflectivity model which differentiates lower level activity from higher level activity when the weather activity is detected from weather systems at long range and the reflectivity using short range thresholds would display only higher level activity. A weather radar display displays multiple colors representative of the different levels of weather activity based on the enhanced returns. [A2085]

"Automotive lane change aid"

A vehicle lane change aid system includes a detector that is operative to detect the presence of an other vehicle adjacent the vehicle, an indicator for providing an indication that a lane change maneuver of the vehicle may affect the other vehicle and a control receiving movement information of the vehicle. The control develops a position history of the vehicle at least as a function of the movement information. The control compares the detected presence of the other vehicle with the position history and provides an indication when a lane change maneuver may affect the other vehicle. [A2086]

"Concealed object detection"

Disclosed are systems, methods, devices, and apparatus to interrogate a clothed individual with electromagnetic radiation to determine if a concealed weapon is being carried. This determination includes establishing data corresponding to an image of the individual and processing data sets corresponding to a number of spatial frequency representations of different image portions to evaluate if the concealed weapon is present. [A2087]

"Smart license tag system"

A system for providing the identification and tracking of motor vehicles that includes a probe device that transmits a radio frequency modulated signal to a transponder unit that is located within a vehicle registration tag of a vehicle. The transponder unit responds to the probe unit's request by transmitting its own radio frequency modulated signal containing any information requested by the probe device. [A2088]

"Ultrasonic transceiver and ultrasonic clearance sonar using the same"

In an ultrasonic transceiver, an inner housing has a bottom portion, a first tubular side wall extending from one end surface of the bottom portion and a first flange portion formed on an outer peripheral portion of the first tubular side wall. The bottom portion and first tubular side wall provide a tubular cavity formed therebetween, and the piezoelectric member is mounted on the one end surface of the bottom portion in the tubular cavity. An outer housing has a second tubular side wall coaxially arranged around the outer peripheral portion of the first tubular side wall with a predetermined gap therebetween. The second tubular side wall is provided with one end portion which is opposite to one end surface of the first flange portion and contacted thereto. A first absorption member is inserted in the gap between the first tubular side wall and the second tubular side wall. [A2089]

"Method and system for vehicle operator assistance improvement"

A method improves operator assistance of an automobile. On substantially real time basis, data on the automobile and on intervehicle relationship involving the automobile are collected. The data are processed to determine variables for evaluation. The determined variables are evaluated to recommend control input. [A2090]

"Tracking system and method employing multiple overlapping sensors"

A tracking system and method of estimating position and velocity of an object are provided. The tracking system includes first and second sensors for sensing an object in first and second fields of view, respectively. The first and second fields of view partially overlap to provide an overlapping coverage zone. Each of the sensors measures range and range rate of the object. The system further includes a controller for estimating position and velocity of the object as a function of the measured range and range rate signals, without requiring sensing of the azimuth angle of the object. [A2091]

"Back-up aid indicator using FMCW chirp signal or a time domain pulse signal"

A back-up aid indication system includes a sensor for providing detection coverage in a predetermined coverage zone behind a vehicle. The sensor includes a transmit antenna adapted for transmitting an RF signal having a quasi-collimated antenna pattern in a near field. The system further includes a waveform generator which selectively provides one of a frequency modulated continuous wave FMCW Chirp signal and a pulse waveform signal as the transmitted RF signal. [A2092]

"Advanced asynchronous pulse detector"

An asynchronous pulse detector including a data estimator which estimates the return signal based on the corrected return signal, a detector for detecting an asynchronous pulse in the return signal, and a selector for selectively outputting the estimated return signal in place of the return signal as the corrected return signal in the event the detector detects an asynchronous pulse in the return signal. [A2093]

"Integrated receiving/backscattering arrangement for contactless data transmission"

A receiving/backscattering arrangement for carrying out a contactless data transmission includes an integrated circuit having two antenna contacts, a series arrangement of three high quality capacitances connected between the two antenna contacts, whereby the middle capacitance is an MOS varactor, a controllable variable voltage source connected across the MOS varactor, and a control unit that controls the voltage source. The receiving/backscattering arrangement is especially a passive transponder with a rectifier connected between the antenna contacts, or a semi-passive transponder including a battery or solar cell, to provide the required supply voltage for the circuit. The arrangement achieves a large communication range, for receiving and modulating an interrogation signal, and backscattering the modulated response signal with a high efficiency and low losses. The integrated circuit structure is compact and economical. [A2094]

"Method and apparatus for controlling an airbag"

Method and system for controlling deployment of an airbag in which the position of an occupant to be protected by deployment of the airbag is determined, the probability that a crash requiring deployment of the airbag is occurring is assessed and deployment of the airbag enabled in consideration of the determined position of the occupant and the assessed probability that a crash is occurring. Deployment of the airbag may be enabled by analyzing the assessed probability relative to a pre-determined threshold whereby deployment of the airbag is enabled only when the assessed probability is greater than the threshold. The threshold may be adjusted based on the determined position of the occupant. [A2095]

"Guided wave radar level transmitter with automatic velocity compensation"

A guided wave radar transmitter comprises a probe defining a transmission line including a relatively low impedance target marker above an expected sensing region of the probe. A pulse circuit is connected to the probe for generating pulses on the transmission line and receiving a reflected signal from the transmission line. The reflected signal selectively includes a target pulse representing the target marker and a level pulse representing material along the length of the probe. A controller is operatively connected to the pulse circuit. The controller normally operates at a relatively low gain to determine a level time to the level pulse to determine material level, and periodically operates at a relatively high gain to determine a target time to the target pulse. The target time is used to compensate the level time for properties of vapor above the material level. [A2096]

"Method for controlling a producing zone of a well in a geological formation"

System and methods for transmitting and receiving electromagnetic pulses through a geological formation. A preferably programmable transmitter having an all-digital portion in a preferred embodiment may be operated at frequencies below 1 MHz without loss of target resolution by transmitting and over sampling received long PN codes. A gated and stored portion of the received signal may be correlated with the PN code to determine distances of interfaces within the geological formation, such as the distance of a water interfaces from a wellbore. The received signal is oversampled preferably at rates such as five to fifty times as high as a carrier frequency. In one method of the invention, an oil well with multiple production zones may be kept in production by detecting an approaching water front in one of the production zones and shutting down that particular production zone thereby permitting the remaining production zones to continue operating. [A2097]

"Ranging system and method for satellites"

In a satellite ranging system predetermined bit sequence or group of bit sequence in a transport stream, which is a digital signal are used to generate trigger signals on the basis of which the delay introduced into the transport stream by the travel path from a satellite ground station to the satellite and back or to another satellite ground station is determined allowing a calculation of the distance between the ground station (s) and the satellite. The predetermined bit sequence or group of bit sequences may be inserted into the transport stream at the uplink site, for example as a specific payload P. In order to avoid insertion of additional packets the transport stream or part of it may be used as a predetermined bit sequence. [A2098]

"Method and device for determining separation and relative speed of a distant object"

The distance and relative speed of an object remote from an observation point determined using a signal form which includes two signals having a predetermined spacing relative to each other. The two signals are transmitted for a certain time interval during which the frequency of the signals is modulated in a stepwise fashion. Additionally, the signal sections of the two signals are transmitted alternately for each step so that there is a predetermined frequency spacing between the signal sections being emitted consecutively. [A2099]

"RADAR APPARATUS for IMAGING AND/OR SPECTROMETRIC ANALYSIS and METHODS of PERFORMING IMAGING AND/OR SPECTROMETRIC ANALYSIS of A SUBSTANCE for DIMENSIONAL MEASUREMENT, IDENTIFICATION and PRECISION RADAR MAPPING"

Radar apparatus and methods of use thereof for imaging and/or spectrometric analysis. The invention employs pulsed radar signals for magnifying, imaging, scale measuring, identifying and/or typecasting the composition of substances by radargrammetric imaging and/or statistical analysis of energy/frequency spectrums. The invention may be used to locate and/or distinguish a substance from other substances, to image a substance/feature and to monitor the movement of an imaged substance/feature. The systems and methods can be adapted for a variety of applications at a wide range of scales and distances, from large scale, long range applications such as geophysical imaging/analysis, to the small scale such as material typecasting applications and small scale (including microscopic) imaging/analysis, including biological and medical imaging and diagnostic applications. The invention includes novel antenna assemblies and novel data processing techniques. [A2100]

"Side impact automotive crash sensor system"

A side impact crash detection system (12) for an automotive vehicle (10) is provided that has a side impact sensor (16) that generates a relative closing velocity signal of an object (18) . A side slip sensor (24) is positioned within the vehicle and generates a side slip signal corresponding to the side slip of the vehicle (10) . A controller (14) is coupled to the side impact sensor and the side slip sensor. The controller (14) generates an object tracking signal in response to the relative closing velocity signal and the side slip signal of the vehicle. [A2101]

"Radio wave measurement of surface roughness through electromagnetic boundary conditions"

Systems and methods for radio wave measurement of surface roughness using electromagnetic boundary conditions. A representative method includes measuring electromagnetic wave fields by monitoring a plurality of signals at several frequencies from different directions, obtaining a plurality of electromagnetic boundary conditions from the plurality of signals, and determining a roughness energy spectrum by utilizing the plurality of electromagnetic boundary conditions. [A2102]

"Sensor fusion system architecture"

A sensor system for generating information useful for determining the environment surrounding a vehicle includes multiple sensing zones, with each zone using sensors operating in different electromagnetic bands. The outputs of the sensors are fused to provide more useful information than that obtainable from either sensor, taken alone. [A2103]

"Vehicle surroundings monitoring apparatus"

A laser radar scanningly irradiates electromagnetic waves around a subject vehicle detects the electromagnetic waves reflected from objects around the subject vehicle, and outputs detected distances from the subject vehicle to the objects in the respective directions of scanning irradiation. A recognition unit detects, based on the detection results of the laser radar, a relative position and a relative speed of each of the objects around the subject vehicle with respect to the subject vehicle. The recognition unit stores whether or not detection points data (i.e., a direction of scanning irradiation and a detected distance in that direction) exists and determines attributes such as positions, sizes, etc., of the objects lying around the subject vehicle. In coordination with the recognition unit, an object tracker calculates relative speeds as between the vehicle and detected objects, with particular reference to objects exhibiting a greater difference in relative speed over time. [A2104]

"Positional data utilizing inter-vehicle communication method and traveling control apparatus"

Predicted future positions are calculated (S11) and arranged into packets (S12) to be transmitted using a communication pattern (for example, a PN series) based on a time and a position of each packet (S13) . Another vehicle calculates its predicted position (S21) and generates a communication pattern based on a result of calculation (S22) so that the generated communication pattern is utilized for reception (S23) . Consequently, data associated with a future position of its own can be selected for enabling reception. An existence probability is calculated, and the state of another vehicle can be accurately understood from the communication of the calculated existence probability, thereby effectively reducing chance of collision. [A2105]

"Accurate distance measurement using RF techniques"

A system, apparatus, and method for determining the distance between two objects using an indirect propagation delay measurement is disclosed. A frequency hopping scheme (such as the Bluetooth.TM. technology) is used to measure the relative phase offset of the received signal between the various frequencies. for a given distance between the objects, the phase offset vs. frequency curve is a straight line with the slope dependent upon the measured distance. After the phase of the received signals is detected, the data is plotted on a curve and the slope is calculated. [A2106]

"Monitor system of vehicle outside and method of monitoring same"

A monitor system of a vehicle outside includes an image-measured distance detector for detecting a distance between a vehicle and a three-dimensional object existing in front of the vehicle based on information of an image in front of the vehicle, a laser-measured distance detector for detecting the distance between the vehicle and the three-dimensional object existing in front of the vehicle on the basis of the information of a laser radar for projecting a laser beam from the vehicle, and a final distance setting unit for finally setting the distance between the vehicle and the three-dimensional object existing in front of the vehicle according to the distance detected the image-measured distance detector and the distance detected by the laser-measured distance detector. [A2107]

"Method for operating a pre-crash sensing system with object classifier in a vehicle having a countermeasure system"

A control system (10) for an automotive vehicle (50) coupled to a countermeasure system having a countermeasure includes an object sensor system (18) generating an object signal, an object distance signal, an object azimuth position signal, and object relative velocity signal. The control system (10) further includes an object classifier coupled to the object sensor system (18) generating an object classification signal in response to the object signal and a controller coupled to the object sensor object classifier for activating the countermeasure (42) in response to the object distance, object azimuth position, relative velocity and the object classification signal. [A2108]

"Method for increasing the unambiguous distance in FSK radars"

A method used to increase the ambiguity distance of FSK radars implements a waveform made up of patterns consisting of frequency plateaux whose frequencies are alternately shifted by plus or minus a value .DELTA.f'. With this waveform, the method associates processing operations to eliminate ambiguous echoes and image signals. This method has the advantage of not modifying the repetition period of the radar to which it is applied. The method according to the invention can be applied especially to radars in automobiles and especially to anti-collision radars. [A2109]

"Simultaneous dual polarization radar system"

A simultaneous dual polarization radar system is disclosed that utilizes a RF power divider to replace the high speed dual polarization switches utilized in current dual polarization radar systems. The disclosed systems allow for transmission and reception in both horizontal and vertical signal modes simultaneously while repositioning critical receiver components above the elevation rotary coupler in a radar pedestal. A bypass switch is also utilized to allow for mode switching of a radar system and a dual polarization reception design is shown to allow for the economical capturing of linear depolarization ratios of selected atmospheric areas. These new designs eliminate the current problems experienced in current dual polarization radar system of long dwell times and velocity range reductions, and the elimination of the relatively expensive and unreliable polarization switch. [A2110]

"Vehicle situation alert system with eye gaze controlled alert signal generation"

A system responds to detection of a vehicle situation by comparing a sensed eye gaze direction of the vehicle operator with data stored in memory. The stored data defines a first predetermined vehicle operator eye gaze direction indicating a high probability of operator desire that an alert signal be given and a second predetermined vehicle operator eye gaze direction indicating a low probability of operator desire that an alert signal be given. On the basis of the comparison, a first or second alert action is selected and an alert apparatus controlled accordingly. for example, the alternative alert actions may include (1) generating an alert signal versus not generating the alert signal, (2) generating an alert signal in a first manner versus generating an alert signal in a second manner, or (3) selecting a first value versus selecting a second value for a parameter in a mathematical control algorithm to determine when or whether to generate an alert signal. [A2111]

"Method and apparatus for a power system for phased-array radar"

A power system for a phased-array radar system powers an antenna array with a single multiphase transformer. A plurality of AC/DC converters are connected in parallel between the single multiphase transformer and a common bus. The common bus is balanced with respect to chassis ground reducing noise and improving operating safety of the antenna. The AC/DC converters each has a multi-sloped characteristic which enables the converters to share power by modifying output impedance as a function of load without external control signals. The system also has several layers of fault detection. [A2112]

"Radar beam scanning method, on-vehicle radar apparatus and radar scanning computer program"

In the on-vehicle radar apparatus of the present invention, the vertical scanning width of the radar beam is narrowed, before the horizontal scanning, thereby avoiding unnecessary data processing and improving the data processing efficiently. Further, the S/N ratio of the target detection signal is increased, thereby stabilizing the distance detection and its accuracy. The vertical scanning antenna is a single travelling wave excitation antenna (TWEA) constructed by a plurality of antenna elements. At the same time, the horizontal scanning antenna is a multi-channel antenna wherein a plurality of TWEAs is assigned to a plurality of horizontal directions. The horizontal scanning angle is arbitrarily widened by increasing the number of TWEAs. [A2113]

"Methods and apparatus for detecting threats in different areas"

Methods and apparatus for early detection and identification of a threat such as individuals carrying hidden explosive materials, land mines on roads, etc. are disclosed. Methods comprise transmitting radar signals in the direction of a potential threat, measuring the energy in reflected signals, dynamically generating a threat threshold value from signals received from multiple areas and comparing the energy in the reflected signals corresponding to different areas to the generated threat threshold value. The threat threshold value may be generated by averaging the weighted reflected energy measured from different areas during a single scan of a region including the different areas. The contribution to the threshold from different areas is weighted in some embodiments as a function of the distance from the transmitter and/or receiver to the particular area. Analysis of areas and treating different areas as segments facilitates accurate analysis and display of threat information. [A2114]

"Tracking system, apparatus and method"

A remotely-locatable tracking device and system is presented for use with a projectile that contacts a mobile target. The device is particularly useful with hunting arrows that contact a target animal. The device detaches from the arrow and attaches to the animal upon impact. The device is preferably comprised of a passive transponder and the system preferably uses a handheld transceiver to locate the transponder attached to the target animal. [A2115]

"System and method for controlling an object detection system of a vehicle"

A system is disclosed for controlling an object detection system of a land based vehicle, having at least one detection device with a limited geometrical operating area. The system comprises a computing device using information regarding the current or upcoming road situation from an on-board map database as input for computing an attention plan for optimizing the use of the at least one detection device in the object detection system, said attention plan being outputted to the object detection system for control of said detection device. Further, a method is disclosed which relates to controlling an object detection system. [A2116]

"Location/status-addressed radio/radiotelephone"

Point-to-point or point-to-multipoint communications are established based on a database query broadcast to all stations. Stations satisfying the query respond and communications are established with the station (s) responding. The database query is preferably directed to location, status or history of the station being queried. Responding stations may be displayed on a moving map and establishing communications with a responding station can be established by touching an icon of the station on a touch screen display. [A2117]

"Automatic registration of images in digital terrain elevation data"

A method of registering reconnaissance image data with map data is disclosed, comprising recording image data at a plurality of positions, together with the role, pitch and height above mean sea level data from an airborne navigation system and imaging system, and recording altitude of a reconnaissance craft from an altimeter, obtaining a difference between said recorded altitude data, and an altitude calculated from said navigation system data and a map data, selecting a difference data having a lowest standard deviation, and at a position of said selected difference data generating a three dimensional surface data using a bi-quadratic equation, generating a bi-quadratic surface of each of a plurality of positions for which data is recorded, generating a difference data between said bi-quadratic surface data, and height data obtained from said map, and minimising an error between bi-quadratic surface data and said height data by translating said position data relative to said map data, until minimum error is achieved, registering said image data with said map data after applying a said translation of said image data. [A2118]

"Method and system for analyzing overhead line geometries"

Methods and systems are provided for characterizing an overhead line. A radar signal is propagated in a region that includes at least a portion of the overhead line and a reference object, which may, for example, be a ground surface, growth over a ground surface, or another overhead line. A reflected radar signal is received from the overhead line and the reference object. A determination is made of a geometric relationship between the overhead line and the reference object, such as by determining a minimal separation between the overhead line and the reference object. [A2119]

"System and method for display radar data"

A system for displaying radar data from two or more areas of interest is provided, such as for simultaneously showing vehicle speeds in the opposite lane in front of the patrol vehicle and in the same lane behind the patrol vehicle. The system includes a first display that shows the speed of vehicles in the first area, such as the opposite lane in front of the patrol vehicle, and a second display that shows the speed of vehicles in the second area, such as the same lane behind the patrol vehicle. [A2120]

"System for determining position and velocity of targets from signals scattered by the targets"

The present invention relates to a system for using signals scattered by targets to determine position and velocity for each of the targets and comprises a set of transmitters and receivers of electromagnetic or acoustic signals, said transmitters and receivers dispersed to known points. Each pair of transmitter and receiver, monostatic or bistatic, is named a measuring facility. The ranges of the transmitters are chosen so that a target at an arbitrary point within the position space can be measured via scattering in the target by at least four measuring facilities. for each measuring facility, target detection occurs with constant false alarm rate in the form of probabilities over resolution cells with regards to range and Doppler velocity and conceivable targets are placed in a 2-dimensional linear space belonging to the measuring facility. The 3-dimensional positions and 3-dimensional Doppler velocities are represented as a 6-dimensional linear position and velocity space subdivided into resolution cells with the same resolution of range and Doppler velocity that is found at the measuring facilities. for each intersection representing detections at at least four measuring facilities the probability is calculated that the intersection is a false alarm emanating intersections between subsets from different targets and when the probability falls below a predefined value, it is given that the intersection contains at least one target. The target positions and target velocities are extracted in this way." [A2121]

"Forecasted radar mosaics"

A system and method to build a radar reflectivity forecast mosaic from a collection of radar sites. The radar data from multiple radar sites is processed to create movement information for all of the precipitation areas. The movement information and precipitation areas are then mosaicked in a common geographical framework to create forecasted radar reflectivity mosaics. By using the reflectivity information and movement information from multiple radars, a wider scale, more coherent radar forecast can be generated. [A2122]

"Circular superdirective receive antenna arrays"

Systems and methods are described for circular superdirective receive antenna arrays. A method includes calculating an minimum array efficiency of the superdirective circular receive array, calculating a maximum superdirective gain of the superdirective circular receive array, determining an amplitude weight or a phase weight for an array element in the superdirective circular receive array based on the minimum array efficiency and the maximum superdirective gain, and determining number of array elements in the superdirective circular receive array and a radius of the superdirective circular receive array. [A2123]

"Method for pulse width modulation of a radar system"

A radar system is operated by controlling and thereby limiting the mean power of the transmitted signal in response to the mean power of the received signal thereby limiting the power to a predetermined power range. Preferably the power control or regulation is performed by varying the pulse repetition frequency and/or the pulse duration of the transmitter pulses. This method is well suited for operating a motor vehicle range warning system. [A2124]

"Method and device for assisting in a passing maneuver for motor vehicles"

A method for assisting, in a passing maneuver, for motor vehicles having a distance and speed control device, in which vehicles in the passing lane are taken into account and, if the traffic situation detected by sensors or an intervention by the driver suggests a desire to pass, control is temporarily carried out to an increased passing speed. The distances to the vehicles located in the passing lane are measured and the passing speed is calculated as a function of the distances of the vehicle to be passed and at least the vehicle directly preceding in the passing lane. [A2125]

"Microwave sensor"

MW sensor 1 in one or more embodiments of the present invention is equipped with distance identifying means 41 capable of calculating relative distance (s) from the distance identifying means to object (s) at least partially within protected area (s) based on reflected wave (s) , moved distance identifying means 42 capable of calculating moved distance (s) per unit time of object (s) at least partially within protected area (s) , and object determination means 43 capable of receiving output (s) from distance identifying means 41 and moved distance identifying means 42, and capable of carrying out object detection determination operations (s) such that moved-distance-per-unit-time value (s) , at least one of which serves as trigger value for object detection determination, is or are set lower as relative distance (s) to object (s) at least partially within protected area (s) grow smaller. As a result, a situation may be achieved whereby object (s) is or are not determined to have been detected when plant life or the like sways due to wind at location (s) comparatively distant from MW sensor 1. In contrast thereto, when human being (s) or the like approach, reaching location (s) comparatively near to MW sensor 1, it is possible to achieve a situation whereby object detection is determined to have occurred even where the speed of movement thereof is small. [A2126]

"Stopped object filtering for side object detection system"

An object-presence alert is given to a driver by a vehicular side-object detection system in response to a remote sensor for sensing objects in a predetermined zone of interest along side a vehicle. The zone of interest includes a front region and a rear region, and the remote sensor provides sensor data to generate a set of localized detection points. When detection points are sensed in the zone of interest, then a plurality of respective sets of detection points are collected at successive sample times. for each of the sets of detection points, a tracking type of the object within the zone of interest is determined in comparison to a speed of the vehicle and the object is classified as either a moving vehicle or a stationary object in response to the tracking type and in response to locations of the detection points in the zone of interest. If the object first appeared in a region other than the front region, then a short observation period is selected including a first predetermined number of sets of detection points and otherwise a long detection period is selected including a second predetermined number of sets of detection points longer than the first predetermined number. A number of times that the object is classified as a moving vehicle within the selected observation period is compared to a predetermined percentage threshold and the alert is initiated if classified as a moving vehicle for greater than the predetermined percentage threshold. [A2127]

"Device and method for the detection of buried objects"

A device and method for detection of buried objects (40) utilizing a down looking infrared array (140) having infrared detectors (170) positioned in a sensor array (30) . This sensor array (30) may also contain ground penetrating radar (70) and EMI coils (80) . All signals from the ground penetrating radar (70) , EMI coils (80) and down looking infrared array (140) may be combined to generate alarms (1100) . However, the down looking infrared array (140) may be utilized as a sole means of detecting buried objects (40) . This device and method for detecting buried objects (40) utilizing down looking infrared array (140) reduces the cost of construction and maintenance of such a device. [A2128]

"Proximity fuze"

A proximity fuze for use in a tube launched projectile carrying a payload, comprising an oscillator for generating a radio frequency signal which has a varying frequency, a single antenna for transmitting the radio frequency signal and for receiving an echo of the radio frequency signal, a first signal processor for generating a range signal corresponding to the time delay between the transmission of the radio frequency signal and the receipt of the echo signal, second signal processor for comparing the range signal with a reference signal and depending on the result of the comparison generating an activation signal for activating the payload, wherein a directional coupler is used for coupling the radio frequency signal from the oscillator to the antenna and to the signal processor and for coupling the echo signal from the antenna to the signal processor, and wherein the second signal processor comprises a threshold detector, a peak detector and a comparator, the threshold detector being for allowing the comparator to utilise the output from the peak detector only once the range signal has reached a predetermined magnitude. [A2129]

"Monitor system of vehicle outside and the method thereof"

When a vehicle travels on an approximately straight lane, a distance data diagnosing section determines a distance measuring capability in a survey area in which the field of view of a laser radar overlaps that of an image as to a three-dimensional object. Then, the distance data diagnosing section determines whether or not the image-measured (laser-measured) distance data of the three-dimensional object exists, and when the image-measured (laser-measured) distance data thereof does not exist, the three-dimensional object is counted to the number of three-dimensional objects without image (without laser radar) and calculates three-dimensional object non-detecting ratios of image (laser radar) from the total number of three-dimensional objects to be determined and the number of three-dimensional objects without image (without laser radar) . [A2130]

"Vehicle travel control system"

A vehicle travel control system wherein a plurality of objects ahead of a subject vehicle are detected by a radar system. Data corresponding to the plurality of objects within a predetermined region is united into a target object corresponding to a large-sized vehicle. If one of the objects is in a region spaced forward a predetermined distance from a representative position of the target object, which is spaced leftwards in a direction toward at an estimated locus at a predetermined distance apart from a left end point of the representative position, which is spaced forward at a predetermined distance from the subject vehicle and which is included in the estimated locus of the subject vehicle, one of the objects is separated as a target object corresponding to a small-sized vehicle from the original target object to control the traveling of the subject vehicle relative to the small-sized vehicle within the estimated locus. [A2131]

"System and method for baseband removal of narrowband interference in ultra wideband signals"

A system, method, and computer program product for baseband removal of narrowband interference contained within UWB signals in a UWB receiver. The RFI is extracted from the UWB signal by employing a filter that is matched approximately with the RFI in the baseband signal, extracting RFI, and passing the desired data signal unscathed. [A2132]

"Signal processing"

A method and apparatus for processing of a signal in which a variation in phase between a transmitted and reflected pulse is modeled, as is the amplitude of the pulse. The modeled phase and amplitude are used to smooth the data by reducing phase noise present on the signal thereby enhancing the signal to noise ratio. [A2133]

"Method for adaptive target processing in a motor vehicle radar system"

A method for adaptive target processing in a vehicle the radar involves first detecting targets in the monitored environment with respect to their speed and location in a standard mode of the radar sensor, and then switching to a precision mode, in which the distance measuring range of the radar sensor is adapted to the target surroundings detected in the standard mode. More particularly, the measuring accuracy and/or resolution regarding speed is increased by increasing the time of observation within the distance measuring range adapted to the target surroundings. [A2134]

"Method of compensating for atmospheric effects while using near horizon radar"

A method of compensating for atmospheric effects to detect the actual location of low elevation objects using near horizon radar to detect an object which utilizes a preexisting satellite, wherein the location of the satellite is known. The method includes a step of providing a radar site, a first receiver structured to receive a signal from the satellite, and known location data for the satellite then positioning the first receiver near the radar site. The first receiver is utilized to receive a signal from the satellite when the satellite is at a low elevation. The bending angle can then be determined by comparing the apparent location data of the satellite as determined by the first receiver to the known location data of the satellite. This data may also be combined with weather data is used to determine a three dimensional refractivity model. Once the bending angle of the atmosphere is determined, the radar is used to detect the apparent location data of a low elevation object. The location of the low elevation object can then be determined by applying the bending angle to the apparent location data of the object. [A2135]

"Methods and apparatus for stationary object detection"

The present invention provides systems and methods for measuring the likelihood that detected stationary objects are not normally present at a sensed location. Such systems and methods may be used by other systems to which information from the present invention are communicated, for minimizing nuisance alerts in onboard object detection systems such as collision warning, collision avoidance, and/or adaptive cruise control systems. The system includes at least one vehicle mounted sensor capable of sensing at least a target object and providing data related to the target object. The system also comprises a locating device which is capable of determining and providing data related to the location of the machine or vehicle and a processing unit which receives the data from the sensor and the data from the locating device. The processing unit is configured to determine a probability estimate or measure of likelihood that the target object is not a normally present object based upon a comparison to previously recorded data from a reference storage device. The reference storage device stores the previously recorded data acquired from at least one similar sensor and a vehicle locating device while operating in the same geographic area, or stores data derived from such previously recorded data. The invention may enhance vehicle collision warning, collision avoidance and/or adaptive cruise control systems as examples. [A2136]

"Radar apparatus equipped with abnormality detection function"

Disclosed is a radar apparatus equipped with a function for detecting an abnormality of modulation width. Distance r.sub.t2 at time t.sub.2 is calculated from the values of the distance R.sub.t1 and the relative velocity V.sub.t1 measured at time t.sub.1 and the elapsed time t.sub.2 -t.sub.1, and the difference relative to the actual measured value R.sub.t2 is compared with a threshold value C.sub.1. If the difference relative to the actual measured value exceeds the threshold value C.sub.1, the modulation width is judged to be abnormal. [A2137]

"System and method for processing radar data"

A system for processing radar data from two or more areas of interest is provided, such as for simultaneously processing vehicle speeds in the opposite lane in front of the patrol vehicle and in the opposite lane behind the patrol vehicle. The system includes an antenna signal processor that receives radar data from one or more radar antennae and generates speed data for a first vehicle travelling in a first direction relative to a radar observation point and a second vehicle travelling in a second direction relative to the radar observation point. A display generator system receives the speed data and user-entered display control data, and generates user-readable display data based on the speed data and the user-entered display control data. [A2138]

"Radar device for a vehicle"

A radar device mounted to a vehicle includes a camera for obtaining images including the road surface in front of or behind the vehicle on which it is mounted, a sensor having for obtaining at least positional information on a target object of detection such as another vehicle in front or behind and a control unit for correcting the direction of the center axis of the sensor based on the image obtained by the camera. The control unit detects a line segment along a lane in which the vehicle is traveling, detects a vector indicative of the direction on a road-fixed coordinate system of the obtained line segment, and controls correction of horizontal and vertical directions of the center axis of the sensor so as to coincide with the direction of the detected vector. [A2139]

"Method and apparatus for detecting position of object present in a surrounding detection zone of automotive vehicle"

In method and apparatus for detecting a position of an object present in a surrounding detection zone of an automotive vehicle, a distance of the vehicle to the object is measured, the surrounding detection zone of the vehicle is photographed, the photographed surrounding detection zone to extract is image processed at least one longitudinal edge from the photographed surrounding detection zone of the vehicle, and the position of the object to the vehicle is detected on the basis of a direction of the extracted longitudinal edge and a measured value of the distance to the object. [A2140]

"Wireless communication system using surface acoustic wave (SAW) second harmonic techniques"

SAW devices such as interdigital transducers (IDTs) have been widely used in RADAR applications and as filters. An IDT produces a SAW when excited by a single electrical pulse and can be fabricated to embody a code, which code provides for a passive autocorrelation of a SAW input to the IDT and thereby lends itself to further application as a signal generator in a communication device. However, internal dimensions of IDTs are inversely proportional to operating frequency, such that high frequency IDTs present significant manufacturing difficulties. Fabrication of IDTs for high frequency applications is simplified by exploiting a harmonic frequency SAW generated by IDTs. An IDT may therefore be designed according to fundamental frequency internal dimension criteria but can operate at a multiple of the fundamental frequency, thereby providing much higher frequency operation than conventional SAW systems. A communication system based on SAW harmonic techniques would be low-cost, low-power, small and simple alternative to known short range communications schemes, including for example the Bluetooth.TM. solution. Operation of a second harmonic SAW system at 2.4 GHz based on a fundamental frequency of 1.2 GHz is contemplated. [A2141]

"System and method for detecting and locating underground objects"

A system for detecting and locating an underground object having stationary RF transmitter receivers that define a coordinate system for an area of interest, a sensor adapted to detect presence of an underground object and to provide a presence data, and a mobile RF transmitter receiver that is movable with the sensor, and is adapted to receive and/or transmit location data indicative of location of the mobile transmitter receiver in the coordinate system. A method is also provided for detecting and locating underground object including the steps of establishing a coordinate system for an area of interest, detecting presence of an underground object and providing a presence data upon detection of the underground object, and transmitting and/or receiving location data in a radio frequency, the location data being indicative of location of the underground object in the established coordinate system. [A2142]

"Vehicle perimeter monitor"

A vehicle perimeter monitor having a high range-finding performance of a short distance and capable of presenting correct information to a driver is provided. A radar 1 including a transmitting antenna 2 and a receiving antenna 3 is fixed on a support member 8 which is a support member integral with a door mirror 7. Accordingly, even if the driver changed viewing direction of the door mirror 7, the positions the transmitting antenna 2 and the receiving antenna 3 relative to the door mirror 7 are kept constant. Therefore, though a part of the radiated transmit wave may be reflected by the door mirror 7, by measuring the reflected wave by the door mirror 7 beforehand, the reflected wave can be canceled by a signal processing circuit part 5. [A2143]

"Automotive radar system"

The invention provides a radar system, which can increase a crossrange detection speed in the lane change state by employing a steering angle sensor, etc. loaded on a vehicle without providing additional hardware. A lane-change determining unit receives a yaw rate response from a steering angle sensor, etc., and determines whether the radar-loaded vehicle is in the steering operation for lane change. If the radar-loaded vehicle is in the lane change state, a gain setting unit shifts a tracker gain to a larger value than that in ordinary running, and calculates a range, a crossrange, a relative velocity, etc. relative to a target from the results of tracker processing executed by a filtering unit. By using the calculated range, crossrange, relative velocity, etc., a control determining unit determines whether there is a collision risk, and whether steering operation to avoid a collision is required. If there is a collision risk, a forward collision warning and a control signal for actuating automatic braking are issued. If automatic steering to avoid a collision is required, an automatic steering control signal is issued. When the lane change state is completed, the radar system is returned to the state employing a tracker gain for the ordinary running. [A2144]

"Geolocation subsystem"

The present invention provides apparatus and methods for determining a propagation time of a signal transmitted from a first location to a second location as a request signal and received as a response signal by the first location via a channel. In an example embodiment, a method comprises the step of determining the propagation time of the signal based on a local counter value that represents the time between transmission of the request signal and reception of the response signal, a remote counter value that depends on the request signal and being known to the first location, and a determinable time-delay value. The remote counter value represents an inter-time-delay between the reception of the request signal and the start of transmission of the response signal at the second location. [A2145]

"System and method for detecting an intruder using impulse radio technology"

An intrusion detection system and method are provided that can utilize impulse radio technology to detect when an intruder has entered a protection zone. In addition, the intrusion detection system and method can utilize impulse radio technology to determine a location of the intruder within the protection zone and also track the movement of the intruder within the protection zone. Moreover, the intrusion detection system and method can utilize impulse radio technology to create a specially shaped protection zone before trying to detect when and where the intruder has penetrated and moved within the protection zone. [A2146]

"Vehicle lamp and vehicle illumination and data transmission system incorporating same"

A vehicle lamp that includes an integrated sensor for interacting with an operating environment of a vehicle is provided. The vehicle lamp includes a sensor and a light channel adapted to transmit data received by the sensor. The vehicle lamp can also include a flat wire that has a component integrally formed by the light channel. A vehicle illumination and data transmission system is also provided. The system includes vehicle lamps according to the present invention, and can include sensor processors located within each of a plurality of lamps, or sensor processors that are centrally located within the vehicle. A system processor is connected to the sensor processors and enables operating decisions based upon data received from the environment by the sensors. [A2147]

"Vehicle object detection system and method"

System for obtaining information about an object in the vehicle including one or more resonators or reflectors arranged in association with the object, each resonator emitting an energy signal upon receipt of a signal at an excitation frequency, a transmitter device for transmitting signals at least at the excitation frequency of each resonator, an energy signal detector for detecting the energy signal emitted by each resonator upon receipt of the signal at the excitation frequency, and a processor coupled to the detector for obtaining information about the object upon analysis of the energy signal detected by the detector. The information obtained about the object may be a distance between each resonator and the detector, which positional information is useful for controlling components in the vehicle such as the occupant restraint or protection device. If the object is a seat, the information obtained about the seat may be an indication of the position of the seat, the position of the back cushion of the seat, the position of the bottom cushion of the seat, the angular orientation of the seat, and other seat parameters. The resonator (s) may be arranged within the object and may be a SAW device, antenna and/or

RFID tag. When several resonators are used, each may be designed to emit an energy signal upon receipt of a signal at a different excitation frequency. The resonators may be tuned resonators including an acoustic cavity or a vibrating mechanical element. [A2148]

"Method and device for distance detection"

A distance detection apparatus cancels signal delay times of transmission and reception circuits (13, 15, 22, 25) , which are causes of the errors of distance detection, by receiving a transmission signal turned back directly to measure the difference between the transmission timing and the reception timing at that time, and by setting the value obtained by the measurement as a correction value at the time of obtaining the measurement distance. [A2149]

"Vehicle sensing based pre-crash threat assessment system"

A pre-crash assessment system 1 includes a host vehicle 3 in motion. A remote sensor 4, status monitoring sensors 5, and safety device actuators are coupled to the host object. The remote sensor 4 detects target object dynamics. The status monitoring sensors 5 detect host object dynamics. The safety device actuators activate safety devices. A threshold for each safety device actuator is defined by a safety device activation specification. A safety device controller 10, also coupled to the host object, generates tracking signals based on host object and target object dynamics. The safety device controller 10 also estimates future positions of the host and target objects, and estimates whether the potential for crash between the host and target objects is within the threshold criteria for specific safety device actuation. The controller 10 then controls the safety device actuators when the potential for crash is within the pre-determined threshold criteria. [A2150]

"System for assisting the parking of motor vehicles in parking spaces"

A system is provided for assisting with parking of motor vehicles in parking spaces, having at least one transmitter, arranged on the exterior side of the vehicle for transmitting a signal emitted at least approximately perpendicularly to the longitudinal axis of the vehicle and limited to a small emission angle range, and an assigned receiver for the reflected signal. The transmitted signal is formed of two partial beams having approximately flat surface area emission characteristics, the two areas being situated at least approximately perpendicular with respect to one another. [A2151]

"Vehicle control apparatus"

A vehicle control apparatus includes an obstruction detection unit for measuring a headway distance until an existing ahead of the vehicle by means of a radar device, a unit for performing vehicle control or alarm control on the basis of the headway distance, a unit for detecting detection performance of the obstruction detection means in a vehicle in which the obstruction detection unit is used to perform two or more controls containing the vehicle control or alarm control, and a unit for controlling to stop operation of the vehicle control or alarm control in accordance with the detection performance individually. [A2152]

"Inventory control system using R.F. object identification"

An object circuit for use in an r.f. identification system for locating a specific object by generating identification signals of a specific frequency assigned to a given object, said object circuit including a receiving antenna, a crystal coupled to said receiving antenna, said crystal having a resonant frequency equal to the frequency assigned to the associated object, and circuitry coupled to said crystal for responding to a signal of said assigned frequency received by said object circuit. [A2153]

"Method for automatic association of moving target indications from entities traveling along known route"

A method for automatic association of moving target indications from at least one entity traveling along a route. A moving target indicator radar is used to detect a plurality of moving target indication data. The moving target indication data proximate to the identified route is selected and presented in a distance-time graph, such that each selected moving target indication data has a unique distance along route and a unique observation-time value. The selected moving target indication data are then transformed from the distance-time coordinate to a slope-intercept coordinate, such that co-linear moving target indication data in the distance-time coordinate are transformed into a plurality of points superposed together with nearly identical slope values and nearly identical distance intercept value. The superposed points are mapped back to the distance-time coordinate, and the moving target indication data corresponding to the superposed points are thus associated. The method can be generalized to finding convoys. [A2154]

"Identification and location system for personnel and vehicles"

An identification interrogator is provided for surveillance of objects within an area. The identification interrogator transmits interrogation signals to all objects within the surveillance area, the reflections of which are received back by the interrogator to determine the locations of the objects, and communicates the determined locations to a processing facility to determine their authorized locations. Upon receipt of interrogation signals, some of the objects within the surveillance area broadcast their position and identification to processing facility for correlation with the locations determined by the reflection signals. The locations of other objects are found by correlating the location determined by the reflection signal with a predetermined list of objects and their location within the surveillance area. These may be objects with no means or method to transmit position and identification information, such as rock formations or buildings. If no broadcast information is received from an object and the location of that object determined by the reflection signal cannot be correlated with a predetermined list, than the object has no proper authorization to be within the surveillance area. [A2155]

"Vehicle surveillance system"

An algorithm for improved tracking of Air Traffic Control Radar Beacon System transponders is disclosed. The algorithm can be combined with a system that includes an interrogator which transmits an interrogation signal to an associated vehicle transponder at a first frequency, preferably 1030 MHZ in accordance with FAA regulations, and a receiver array which receives the transponder reply signal transmitted by the transponder at a second frequency, preferably 1090 MHZ in accordance with FAA regulations. An angle of arrival processor calculates an angle of the received reply signal, and a position processor calculates the vehicle position based on at least the received angle data. [A2156]

"Process and device for detecting and monitoring a number of preceding vehicles"

For substantial relieving the driver of a vehicle with respect to the monitoring of the preceding environment as well as the evaluation of distances and speeds of multiple preceding vehicles, there is provided in accordance with the invention a process for detecting and monitoring a number of vehicles (A through C) preceding one's own vehicle (E) , which process divides the preceding environment into at least a near zone (ZII) and at least one distant zone (ZI) , wherein for the preceding vehicles (A through C) respectively their lane (S1 through S3) , speed (V.sub.A through V.sub.C) and/or distance to the monitoring vehicle (E) are determined, and on the basis of the respective determined lane (S1 through S3) , speed (V.sub.A through V.sub.C) and/or distance for the preceding vehicles (A through C) their position with respect to the near zone (ZII) or the distant zone (ZI) are determined, wherein on the basis of the respective determined speeds (V.sub.A through V.sub.C) and/or positions of the preceding vehicles (A through C) the actual speed (V.sub.E actual) of the monitoring vehicle (E) is adjusted. [A2157]

"Threat assessment algorithm for forward collision warning"

An algorithm for use in a forward looking collision warning system employed in a vehicle. The collision warning system includes a radar device that generates track files of the range and speed of objects in the vehicle's path. The system also includes a collision warning processor running the algorithm that receives the track files and various input data to determine whether an alert of a potential collision should be issued, and if so, to what degree. The input data includes the speed and acceleration of the vehicle, whether the vehicle's brakes are being applied, collision warning sensitivity, driver distraction modifiers, road condition data, such as wiper speed and outside air temperature, etc. is provided. The processor calculates an alert level based on the various inputs, and outputs the alert level to a driver vehicle interface to notify the driver of the potential collision. [A2158]

"In-vehicle radar system"

A radar system mounted in a reference vehicle can detect a distance and orientation of a preceding vehicle to thereby compute a relative position of a width center of the preceding vehicle. A curving radius of the reference vehicle is then detected for computing a relative rotation angle between a direction from the reference vehicle and a longitudinal direction of the preceding vehicle. Relationship between a relative rotation angle and a lateral bias of the relative position of the width center is previously prepared in a map. The computed relative rotation angle is applied on the map, so that the corresponding lateral bias is obtained to correct the computed relative position of the width center of the preceding vehicle. Thus, the width center of the preceding vehicle moving in an adjacent lane can be accurately estimated. [A2159]

"Stationary on-road object detection method for use with radar"

A method capable of determining whether a target detected by a radar is a stationary on-road object or not is disclosed, wherein a fluctuation in the reception level of a reflected wave from a target is obtained in relation to the distance of the target, a difference in reception level between a maximum point and a minimum point is obtained from the fluctuation of the reception level, and when the obtained difference is larger than a predetermined threshold value, it is determined that the target is a stationary on-road object. Further, slope over the distance between the maximum point and the minimum point is obtained, and when the obtained slope is greater than a predetermined threshold value, it is determined that the target is a stationary on-road object. Further, the distance between maximum points or between minimum points is obtained, and when the obtained distance is smaller than a predetermined threshold value, it is determined that the target is a stationary on-road object. [A2160]

"Method and device for the detection and track of targets in high clutter"

A method for discriminating and tracking a target in a clutter cloud includes transmitting a radar signal at a signal bandwidth to: identify a range extent of a clutter cloud, determine a centroid and a velocity growth rate of the clutter cloud, and identify a direction of movement of the centroid of the clutter cloud. The method may also include locking a another radar signal having a greater signal bandwidth onto the centroid of the clutter cloud whereby the centroid is tracked within one radar range resolution bin, providing a delay line that includes at least two Doppler filters and is configured to cover a Doppler frequency range corresponding to a velocity growth rate of the clutter cloud, and processing a reflected radar signal corresponding to the greater signal bandwidth. The processing of the reflected radar signal may comprise passing the reflected radar signal through the delay line to mitigate a portion of the reflected signal that is reflected by the clutter cloud. A system and apparatus for performing the method is also provided. [A2161]

"Random-modulation radar signal-induced interference cancellation method and apparatus"

An uncorrelated clutter noise cancellation method and apparatus employing a measured ambiguity function sample for each randomly-modulated transmission pulse in a randomly-modulated pulsed Doppler radar system. The ambiguity function samples are calculated from a stored copy of the randomly-modulated transmission signal. Estimates of the uncorrelated clutter backscatter are first developed by calculating the amplitude and phase of the radar returns detected in target range and velocity cells corresponding to stationary scatterers. The stationary scatterer contribution to each target cell, computed according to the sample ambiguity function, is then subtracted to eliminate the uncorrelated noise component in the return signal for the target cell. This clutter cancellation technique does not rely on correlations between the randomly-modulated transmission signal and the clutter return signal. [A2162]

"Obstacle detecting apparatus of vehicle"

In detecting an obstacle of a vehicle, to be able to eliminate dead angle, shorten a detection period and reduce erroneous detection of the obstacle, when a vehicle runs on a running road, by pivoting a pivoting radar in a direction in accordance with a progressing direction of the vehicle, a total or a portion of a detection range of the pivoting radar can be made to be outside of a detection range of fixed radars. Therefore, an obstacle in a range outside of the detection range of the fixed radars can be detected by the pivoting radar. [A2163]

"Vehicle obstacle warning radar"

The present invention is a radar system for detecting the presence of obstacles. The radar system includes at least one transmitting antenna and at least one receiving antenna. The transmitting antenna receives an input signal and transmits an electromagnetic wave. The electromagnetic wave reflects off an obstacle back to the receiving antenna. The receiving antenna captures the reflected electromagnetic wave and produces an output signal. The output signal is then combined with the input signal in a quadrature mixer. The resulting in-phase (I) and quadrature (Q) signals may be further processed and then transmitted to a processing system. The processing system uses a suitable algorithm, e.g., a back projection algorithm, to estimate the type and location of obstacles that reflected the electromagnetic wave. In an exemplary embodiment, the algorithm is adapted to discriminate between different sizes and locations of obstacles in order to determine if there is a hazard. Based on this information, the processing system then communicates with a visual and/or audible warning system in order to alert the driver about the obstacle if it has been determined to be a hazard. [A2164]

"Apparatus and method for rapid detection of objects with time domain impulsive signals"

A method and system are disclosed for detecting objects of interest in a target area using ultra wide band (UWB) RF signals. A transmitter and antenna array generate ultra wide band RF impulsive signals that are used to probe a target area that may include an object of interest. An antenna and a signal processor receive return signals from the target area and process the return signal to generate a set of coordinates. The coordinates of the processed return signals are compared to coordinates of known objects in a pre-existing database to determine whether there is a match between the return signal and a known object. When there is an indication of a match, the existence of the known object is displayed to an operator of the system. [A2165]

"Method for regulating the distance between a vehicle and another vehicle traveling ahead and a distance-regulating system"

In a method for regulating the distance between a vehicle and another vehicle traveling ahead, vehicle state variables, vehicle characteristic variables are determined together with the distance from and velocity of at least one other vehicle in the vicinity. The distance from the other vehicle and the vehicle's own velocity are set to permitted limiting values. To increase driving safety, the vehicle's own velocity or the setpoint distance from the other vehicle traveling directly ahead are determined as a function of the vehicle velocity of at least one other vehicle traveling to the side, or of the distance between a plurality of other vehicles traveling to the side. [A2166]

"Methods and apparatus for terrain correlation"

A method for testing radar system performance is disclosed which utilizes radar data test points in a radar data file.

The method includes interpolating GPS data from a flight test to provide a GPS data point for every radar data test point, generating body coordinate values for every point in a corresponding digital elevation map (DEM) file using the interpolated GPS data, and applying a bounding function around at least a portion of the body coordinate values generated from the DEM file at a given time. The method also includes determining which body coordinate value generated from the DEM file is closest a current GPS data point for the given time and comparing the determined body coordinate value to the radar data test points at the given time. [A2167]

"Irregular PRT deconvolution method and systems, and its uses"

This invention relates to radar signal processing. In particular, this invention concerns Doppler processing and clutter filtering on irregular Pulse Repetition Time (PRT) sampled signal. This invention solves the above-mentioned drawbacks, in particular solving the velocity ambiguity and filtering any type of clutter, providing a deconvolution method which filter any kind of clutter even varying clutter like sea clutter, rain clutter . . . The deconvolution method of irregular pulse repetition time sampled signal x (t.sub.m) , comprises the following steps: [S1] conversion of the irregular samples x (t.sub.m) to regular samples r (iT.sub..epsilon.) , [S2] computation of the spectrum dft (r) of these regular samples, [S3] isolation of the clutter spectra in dft (r) by assuming clutter spreads over more than a few range gates, [S4] estimation of the clutter spectral lines from the mean and the width of the isolated clutter spectra, [S5] subtraction of the estimated clutter spectra from the total spectrum dft (r) , [S6] deconvolution of the remaining spectra. [A2168]

"Simulatneous dual polarization radar system"

A simultaneous dual polarization radar system is disclosed that utilizes a RF power divider to replace high speed dual polarization switches utilized in current dual polarized radar systems. The disclosed systems allow for transmission and reception in both horizontal and vertical signal modes simultaneously while repositioning critical receiver components above the elevation rotary coupler in a radar pedestal. A bypass switch is also utilized to allow for mode switching of a radar system and a dual polarization reception design is shown to allow for the economical capturing of linear depolarization ratios of selected atmospheric areas. These new designs eliminate the current problems experienced in current dual polarization radar system of long dwell times and velocity range reductions, and the elimination of the relatively expensive and unreliable polarization switch. [A2169]

"Vehicle pre-crash sensing based conic target threat assessment system"

A pre-crash assessment system includes a host vehicle in motion. A remote sensor, status monitoring sensors, and safety device actuators are coupled to the host object. The remote sensor detects target object dynamics. The status monitoring sensors detect host object dynamics. The safety device actuators activate safety devices. A threshold for each safety device actuator is defined by a safety device activation specification. A safety device controller generates tracking signals based on host object and target object dynamics by generalized conic curve fitting techniques. The safety device controller also estimates future positions of the host and target objects, and estimates whether the potential for crash between the host and target objects is within the threshold criteria for specific safety device actuation. [A2170]

"Positional data utilizing inter-vehicle communication method and traveling control apparatus"

Predicted future positions are calculated (S11) and arranged into packets (S12) to be transmitted using a communication pattern (for example, a PN series) based on a time and a position of each packet (S13) . Another vehicle calculates its predicted position (S21) and generates a communication pattern based on a result of calculation (S22) so that the generated communication pattern is utilized for reception (S23) . Consequently, data associated with a future position of its own can be selected for enabling reception. An existence probability is calculated, and the state of another vehicle can be accurately understood from the communication of the calculated existence probability, thereby effectively reducing chance of collision. [A2171]

"Breaklock detection system and method"

A tracking system controls an aimed device (32) to keep it aimed at a target (34) . A control system (10) determines when the tracker has lost its lock on the target (34) by comparing the target's instantaneous acceleration with its median acceleration. When the difference exceeds a predetermined threshold, the system searches backwards through a chronological buffer until it finds position data which antedate the receipt of inaccurate position data from the tracker. A second-order filter such as a Kalman filter is used to provide estimated target states. The difference between a time updated output from the second-order filter (16) and the present measured state from the tracking device is low pass filtered to provide a measurement of the instantaneous acceleration of the target. The buffer (20) stores position, velocity, and median acceleration values covering a span of time at least about twice as long as the time required to determine that a breaklock has occurred. [A2172]

"Traffic surveillance radar using ranging for accurate target identification"

Disclosed is a Doppler shifted radar apparatus for correct target identification with respect to surveillance of moving vehicles. More particularly, an improved radar detection system using two or more continuously transmitted frequencies is used. The multiple frequencies are directed toward target vehicles whereby the phase difference of the two or more reflected Doppler signals is calculated and subsequently used to accurately determine a target range, thereby displaying the closest vehicle and closest vehicle speed. Vehicle speed is determined with use of the standard Doppler frequency shift. The next closest and/or next faster vehicle speed can also be easily determined. [A2173]

"Spread spectrum localizers"

A network of localizers determines relative locations in three-dimensional space to within 1 cm by cooperatively measuring propagation times of pseudorandom sequences of electromagnetic impulses. Ranging transmissions may include encoded digital information to increase accuracy. The propagation time is determined from a correlator circuit which provides an analog pseudo-autocorrelation function sampled at discrete time bins. The correlator has a number of integrators, each integrator providing a signal proportional to the time integral of the product of the expected pulse sequence delayed by one of the discrete time bins, and the non-delayed received antenna signal. With the impulses organized as doublets the sampled correlator output can vary considerably in shape depending on where the autocorrelation function peak falls in relation to the nearest bin. Using pattern recognition the time of arrival of the received signal can be determined to within a time much smaller than the separation between bins. Because operation of standard CMOS circuitry generates noise over a large frequency range, only low-noise circuitry operates during transmission and reception. To provide the time accuracy necessary for distancing, a high-frequency clock operates during inter-localizer communications. The high-frequency clock uses a phase-lock loop circuit to increase the clock rate and a programmable delay to provide still finer time graduations. A stage in the low-frequency clock uses low-noise circuitry during transmissions and receptions, and standard circuitry at other times. [A2174]

"Method and apparatus for detecting vehicle distance"

Stableness in detecting the distance to a preceding vehicle by calculating the distance to the preceding vehicle using reflected waves of a radar beam scanned at a scanning angle that is adjusted based on lane markers extracted from a road image obtained by a camera. [A2175]

"Vehicle-mounted radio wave radar"

An antenna base, a control circuit section, and a high-frequency circuit section are enclosed in an inner space defined by a housing and a radome. Inside this inner space, the control circuit section and the high-frequency circuit section are surrounded by the antenna base and the housing. A circuit GND common to the control circuit section and the high-frequency circuit section is electrically connected to the antenna base and the housing, and it is connected to a body GND through only capacitive impedance. [A2176]

"Object detection system and method of estimating object size"

A collision detection system and method of estimating a miss distance of an object and estimating length and width of the object are provided. The collision detection system includes a sensor for sensing an object within a field of view and measuring range and range rate of the sensed object. The collision detection system further includes a controller for estimating a miss distance of the object and further estimating length and width of the object as a function of the range and the range rate. [A2177]

"Device for controlling distance"

The device ascertains a setpoint distance or a setpoint time gap with respect to a vehicle driving ahead as a function of the traveling speed, the distance control taking a minimum distance or a minimum time gap, specifiable by the driver, into consideration when determining the setpoint distance or the setpoint time gap. Since the driver's impression of distance is dependent on the visibility at the moment, in response to poor visibility (bad weather, darkness) , the distance control increases the setpoint distance or the setpoint time gap ascertained for normal visibility. [A2178]

"Distance/velocity measuring method and radar signal processing device"

A distance and speed measuring method and a radar signal processing apparatus using the method are provided which are capable of obtaining highly reliable measurement results while reducing the number of false targets and undetectable targets, by obtaining the relative distance and the relative speed of each target based on the frequencies of a beat signal of up (or down) phase alone through the use of information in a time series direction of the frequencies of the beat signal of up (or down) phase. [A2179]

"In-vehicle pulse radar device"

An in-vehicle pulse radar device includes: an oscillator that generates an electromagnetic wave, a transmission amplifier that transmits the electromagnetic wave generated by the oscillator toward a target substance, an antenna that receives the reception electromagnetic wave reflected by the target substance to output data, reception amplifiers, a reception antenna, an A/D converter, and a signal processing device that pre-sums data which is sampled on the basis of the data from the A/D converter for each of distance gates, subjects the pre-summed data which is a result of the pre-summing process to an FFT process, and obtains a distance between a subject vehicle and the target substance and a relative speed therebetween in accordance with the spectrum frequency and the amplitude information which are a result of the FFT process. [A2180]

"Inspection device for radar absorbing materials"

The invention is a device for inspecting an assembly including a surface coating containing magnetic radar-absorbing materials on a conductive surface. In detail, the device includes a first system for transmitting an electromagnetic signal to the assembly, which includes a first waveguide made of a conductive material coupled in series to a second waveguide made of a dielectric material. A second system is provided for receiving the portion of the electromagnetic signal reflected from the assembly, which includes a third waveguide made of a conductive material coupled in series to a fourth waveguide made of a dielectric material. Thus the electromagnetic signal is transmitted from the first waveguide to the second waveguide on to the assembly and the portion of the electromagnetic signal reflected off the assembly is received by the fourth-waveguide and transmitted to the third, waveguide. [A2181]

"Article locator system"

A system and method for locating objects such as people, pets, and personal articles is described. A transceiver is attached to the person, animal, or item to be tracked and a handheld locator device is employed to transmit a locator signal containing an address code to the transceiver. Upon receipt of a signal, the transceiver compares the address code contained in the locator signal with an address code stored in the transceiver. If the two codes are same, the transceiver sends a return signal back to the locator device. The locator device uses this return signal to determine the distance and/or direction of the transceiver from the user's location. The system allows a user to select from a multiple number of items to locate and allows multiple users to search for different articles within the same general area without interference. [A2182]

"Near object detection system"

A near object detection (NOD) system includes a plurality of sensors, each of the sensors for providing detection coverage in a predetermined coverage zone and each of the sensors including a transmit antenna for transmitting a first RF signal, a receive antenna for receiving a second RF signal and means for sharing information between each of the plurality of sensors in the NOD system. [A2183]

"Distance sensor device"

A distance sensor device, in particular as a component of a parking aid or reversing aid for a motor vehicle, includes one or more distance sensors and a distance sensor control device for the purpose of activating the distance sensor or sensors via a respective signal line using an activation pulse that is quasi-digital and time-analog. At least one of the distance sensors has two different modes of operation. The modes of operation may be switched by varying the duration and/or amplitude of the activation from the distance sensor control device. [A2184]

"Potential collision detection and parking aid system"

A collision warning and countermeasure system (10) for an automotive vehicle (12) is provided. The system (10) includes a velocity sensor (18) that generates a vehicle velocity signal. A multi-mode object detection sensor (28) generates an object detection signal. The multi-mode object detection sensor (28) operates in a detection mode in response to the vehicle velocity signal. A controller (26) is electrically coupled to the velocity sensor (18) and the multi-mode object detection sensor (28) and generates a countermeasure signal in response to the object detection signal. A method of performing the same is also provided. [A2185]

"Measurement of concentration of material in a process fluid"

An apparatus for measuring concentration of a material in a process fluid includes an antenna configured to contact the process fluid and a pulse generator coupled to the antenna to generate a microwave transmit pulse through the antenna. A pulse receiver receives a reflected pulse from the antenna and the concentration of the material is calculated as a function of the reflected pulse. [A2186]

"Method of calibrating a sensor system"

A method of calibrating a sensor system which is used to detect and analyze objects in the path of a vehicle is described. In this method, characteristic data of the objects is detected with the sensor system, and data interpreted as stationary or quasi-stationary objects, taking into account the vehicle's own motion, is sent to a calibration unit. In the calibration unit, the deviation of the instantaneously measured data from data of a model of the objects is determined as the error vector and used for correcting the data of the model for the purpose of minimizing the deviation. [A2187]

"Audio reception control arrangement and method for a vehicle"

Arrangement and method for controlling audio reception by occupants of a vehicle in which the position of any occupants is determined and the entertainment system controlled to provide specific sound for the occupants based on the determined positions of the occupants. Sound generating components of the entertainment system are automatically adjustable based on the determined position of the occupants. A hypersonic sound generating system may be used wherein ultrasonic frequency generators generate ultrasonic waves which mix with ultrasonic waves generated by another ultrasonic frequency generator to thereby cause the creation of new audio frequencies in an area determined based on the position of the occupants. In addition, the presence and direction of unwanted noise may be detected and sound created to cancel the unwanted noise in the area including the determined positions of any occupants. [A2188]

"Microwave sensor"

A microwave sensor is described, with a self-mixing oscillator (1) , with a transmitting and receiving antenna (2) , with an impedance (3) which is connected between the current or voltage supply (4) and the oscillator (2) , and with an evaluation circuit (5) , the self-mixing oscillator (2) producing both the transmitted signal and also mixing the transmitted signal with the received signal and the low-frequency mixed (Doppler signal) being tapped on the impedance (3) and supplied to the evaluation circuit (5) . The microwave sensor has only lower power consumption, and the microwave sensor can also be economically produced in that the self-mixing oscillator (2) is made as a push-pull oscillator with two transistors (6, 7) . [A2189]

"Automotive radar elevation alignment"

A method and an apparatus for aligning the elevation of an automotive radar unit. The method of aligning a radar transceiver unit (4) on a vehicle (1) having the steps of: positioning at least three radar reflectors (7, 8, 9) in a pattern in which the reflectors are fixed relative to one another with the reflectors occupying three rows (20, 21, 22) at different elevations and at least three different horizontal positions (23, 24, 25) , so that the middle row (21) is horizontally distinguishable from the neighboring rows (20, 22) , directing a beam (14) of radar waves (12) from the radar transceiver (4) generally towards the radar reflectors (7, 8, 9) , scanning (18) , and if necessary repeatedly scanning, the beam (14) relative to the pattern so that the beam moves across the pattern at one or more fixed elevations in a horizontal direction, receiving at the radar transceiver (4) radar waves reflected (17) from one or more of the reflectors (7, 8, 9) , detecting the elevation of the middle row (21) , setting the elevation of the beam (14) of radar waves according to the detected elevation of the middle row (21) . [A2190]

"Position location method and apparatus for a mobile telecommunications system"

In a cellular mobile telecommunications system the position of a mobile station can be estimated in terms of its bearing and range from a cell site. A multi-element direction finding antenna at the cell site receives signals from the mobile station and a receiver circuit estimates the bearing using the relative phase of signals received at different antenna elements and estimates the range by measuring round trip delay of signals to and from the mobile station. Motion of the mobile station can introduce errors into the bearing estimate due to frequency offset and frequency spread when element sampling is non-simultaneous. Compensation for these errors is introduced by using signal samples successively received at the same antenna element to estimate Doppler frequency offset and spread. It is necessary to ensure accurate calibration of the direction finding antenna and the receiver circuit. This is done by injecting calibration signals into the circuit near the antenna or into the antenna itself from a near field probe. Other aspects of calibration, such as antenna position, are calibrated using a remote beacon. A beacon emulating a mobile station but at a fixed, known location, or a beacon at an adjacent cell site may be used. [A2191]

"Crossover detection method, radar apparatus and crossover detection program"

The crossover detection method of a radar apparatus according to the present invention calculates distance/relative velocity information at a multitude of different clock times, using a beat signal, calculates predicted distance/relative velocity information indicating distance/relative velocity, respectively, of a target after a prescribed time has elapsed, calculates predicted distance/relative velocity errors by subtracting the calculated distance/relative velocity information from the calculated predicted distance/relative velocity information, respectively, calculates degree of similarity information, based on the predetermined average predicted distance/relative velocity errors and the calculated predicted distance/relative velocity errors, and determines whether there is crossover, based on the above information. [A2192]

"Method of locating underground utility lines and an underground utility line"

A method of locating an underground utility line. A first step involves securing transponders along a length of an underground utility line at regular spaced intervals. A second step involves interrogating the transponders to receive transponder signals. A third step involves ascertaining the position of the transponder signals and extrapolating positioning of the underground utility line from the transponder signals. [A2193]

"Drillstring radar"

A drillstring radar comprises a measurements-while-drilling instrument for mounting just behind the drill bit and downhole motor of a drill rod. The instrument includes a radar system connected to upward-looking and downward-looking horn antennas. These are used to electronically probe the interface of a coal seam with its upper and lower boundary layers. A dielectric constant sensor is included to provide corrective data for the up and down distance measurements. Such measurements and data are radio communicated to the surface for tomographic processing and user display. The instrument also includes a navigation processor and drill bit steering controls. The radio communication uses the drillstring as a transmission line and F1/F2 repeaters can be placed along very long runs to maintain good instrument-to-surface communication. A docking mechanism associated with the instrument and its antenna array allows the instrument to be retrieved back inside the drillstring with a tether should the drill head become hopelessly jammed or locked into the earth. [A2194]

"Method for determining hydrographic parameters which describe a sea swell field in situ using a radar device"

In a method of determining hydrographic parameters describing a sea swell field from analog signal sequences supplied by radar devices, wherein a sequence of digitized signal in spatial coordinates is generated from the analog signal sequences and, by Fourier transformation, a three-dimensional complex value frequency wave number spectrum is determined therefrom, which is filtered on the basis of the dispersion relation principle that inter-links the wave numbers and the frequencies of the sea swell for a localization of the sea swell-specific parameters by separating the signals from the noise and determining the signal to noise ratio and from the ratio the height of the waves and, by localizing the signal coordinates in the surface area defined by the dispersion relationship, parameters describing the surface currents of the sea swell field in a three-dimensional spectral space and the water depth, from the phase information concerning the waves monitored in the sea swell field the parameters of the sea swell field are determined. [A2195]

"Environmental location system"

A system and method for determining a location. The system employs encoded information devices dispersed through the environment, each having a non-unique code associated therewith. The codes from the encoded information devices are acquired as a reading device passes nearby, and stored. The codes from a proximate set of information devices are correlated with a map or mapping relation to determine one or more consistent positions within the environment. The information devices are preferably passive acoustic wave transponders, and the mapping relation may be a pseudorandom sequence or a defined map. [A2196]

"Remote sensing based pre-crash threat assessment system"

A pre-crash assessment system (1) includes a host vehicle (3) in motion and a high frequency sensor (4) , which detects position and relative velocity of a target object in the near zone of the host vehicle (3) . A safety device actuator (5) is also coupled to the host vehicle (3) . A pre-crash algorithm provides a comparison of a future position prediction of the target object relative to the host vehicle (3) . A safety device controller (9) is coupled to the host vehicle (3) . The controller (9) generates a threshold assessment based on the target object future relative position and relative velocity. The controller (9) also controls the safety device actuator (5) by providing an actuation signal. The controller (9) operates through logic designed to estimate whether a potential for crash between the host vehicle (3) and the target object is within the threshold for the safety device actuator (5) . The controller (9) activates the safety device actuator 5 when the potential for crash is within the pre-determined threshold and safety device specific deployment criteria are met. [A2197]

"Synthetic-aperture communications receivers"

The relative movement of a receiver and transmitter in a communications system is used to advantage by electronically synthesizing a larger apparent antenna aperture, thereby increasing signal-to-noise ratio. The approach may be used regardless of whether the transmitter is fixed and the user or vehicle is moving, or the user or vehicle is fixed and the transmitter is moving. According to the method, the apparent angle between the receiver and transmitter is determined relative to the direction of movement and used to produce time-delayed replicas of the received signaling stream which are coherently added to synthesize the increased apparent receiver antenna aperture. Since only the receiver is modified according to the invention, existing transmitters and infrastructures can be used without modification. Although some data buffering is required, only a few number of beams need to be synthesized, in contrast to more complex military SAR configurations. [A2198]

"System and method for position determination by impulse radio"

A system and a method for position determination by impulse radio using a first transceiver having a first clock providing a first reference signal and a second transceiver placed spaced from the first transceiver. The system determines the position of the second transceiver. The second transceiver has a second clock that provides a second reference signal. A first sequence of pulses are transmitted from the first transceiver. The first sequence of pulses are then received at the second transceiver and the second transceiver is then synchronized with the first sequence of pulses. A second sequence of pulses are transmitted from the second transceiver. The first transceiver receives the second sequence of pulses and the first transceiver is synchronized with the second sequence of pulses. A delayed first reference signal is generated in response to the synchronization with the second sequence of pulses. A time difference between the delayed first reference signal and the first reference signal is then measured. The time difference indicates a total time of flight of the first and second sequence of pulses. The distance between the first and the second transceiver is determined from the time difference. The direction of the second transceiver from the first transceiver is determined using a directional antenna. Finally, the position of the second transceiver is determined using the distance and the direction. [A2199]

"Ocean surface current mapping with bistatic HF radar"

A bistatic radar system (100) , method and computer program (178) are provided for mapping of oceanic surface conditions. Generally, the system (100) includes at least one transmitter (102) and at least one receiver (106) located separate from one another, and each having a local oscillator locked to a Global Positioning System (GPS) signal received by a GPS synchronization circuit (134) to provide the necessary coherency between the transmitted and received signals. Preferably, the present invention enables an existing backscatter radar systems to be quickly and inexpensively upgraded to a bistatic radar system (100) through the addition of a transmitter (102) and/or receiver (106) separate from the backscatter radar system, the GPS circuit (134) , and use of the computer program (178) and method of the present invention. [A2200]

"Reflection multiplier radio wave marker system and traffic system"

A reflection multiplier radio wave marker system which comprises a plurality of transmit antennas mounted on board a vehicle for transmitting electric wave signals in a first frequency, a reflection multiplier radio wave marker installed in the surface of a road, which reflects and transmits the electric wave signal of first frequency after multiplying it into an electric wave signal of a second frequency, and a receive antenna mounted on board the vehicle for receiving the electric wave of second frequency. The system specifies the location of a vehicle in a traffic lane by making use of the second frequency electric wave signal reached from a marker. It can detect a marker throughout substantially the entire width range of a vehicle. A traffic system using the marker system is also disclosed. The function of specifying the location of a radio wave marker is performed throughout the entire vehicle width. [A2201]

"System and method for a distributed search for a lost asset"

A method for searching for a lost asset equipped with a short-range wireless transceiver includes a finder service sending out a search request including a lost-asset identifier, this request being sent over a mobile radio infrastructure to a plurality of mobile devices. These devices transmit on the request in their immediate vicinity using short-range wireless transceivers. Upon a mobile device receiving back a response from the lost asset, it returns a found message over the mobile radio infrastructure to the finder service. This message includes location data concerning the whereabouts of the lost asset or the message enables such data to be obtained by the finder service. [A2202]

"Establishing radar coverage, blockage, and clutter region maps for radar product data based on terrain elevation data"

Radar coverage maps having blockage, coverage and clutter features available for ease of interpretation are provided using terrain data to establish such features in data sets. The data sets provide a basis for the modified display. Multiple tilts of the radar scan may be represented. Multiple radar zones may be overlapped to provide a mosaic of a region showing areas of no coverage despite overlap. [A2203]

"Method for obtaining underground imagery using a ground-penetrating radar"

A method for using ground-penetrating radar to obtain subsurface imaging. The radar comprises resources for transmitting, receiving and processing signals. In one method embodiment, signals are transmitted from a fixed point relative to the subsurface and with the aid of at least two electrical antennae. Signals reflected or backscattered by reflectors or diffusers of the said subsurface are received by way of the electrical antennae and by way of three magnetic antennae. Finally, the reflected or backscattered signals are processed using an algorithm to obtain the imaging of the said subsurface. [A2204]

"Vehicle-mounted radar apparatus providing improved accuracy of detection of lateral position of preceding vehicle"

A vehicle-mounted radar apparatus which periodically derives and registers successive momentary position values for a target object such as a preceding vehicle based on received reflected radio waves and derives final lateral position data by smoothing the momentary position data, judges when a degree of scattering of the registered momentary position values exceeds a first predetermined level and in that case derives corrected position data based on differences between envelope curve line values which are generated based on local extreme values of the momentary position data, and performs smoothing of the corrected position data instead of the momentary position data, to obtain the final lateral position data. If the target object is not estimated to be located directly ahead of the host vehicle along a straight route, the corrected position data are adjusted in accordance with relative positions and orientations of the target object and host vehicle. [A2205]

"Remote down-hole well telemetry"

The present invention includes an apparatus and method for telemetry communication with oil-well monitoring and recording instruments located in the vicinity of the bottom of gas or oil recovery pipes. Such instruments are currently monitored using electrical cabling that is inserted into the pipes, cabling has a short life in this environment, and requires periodic replacement with the concomitant, costly shutdown of the well. Modulated reflectance, a wireless communication method that does not require signal transmission power from the telemetry package will provide a long-lived and reliable way to monitor down-hole conditions. Normal wireless technology is not practical since batteries and capacitors have to frequently be replaced or recharged, again with the well being removed from service. RF energy generated above ground can also be received, converted and stored down-hole without the use of wires, for actuating down-hole valves, as one example. Although modulated reflectance reduces or eliminates the loss of energy at the sensor package because energy is not consumed, during the transmission process, additional stored extra energy down-hole is needed. [A2206]

"Method for reducing false alarm rate in radar images"

A method for reducing the false alarm rate, i.e. the number of alarms of fixed targets erroneously declared as moving targets in the radar images of two- or multi-channel MTI radar devices, wherein the suppression of fixed target echoes over the moving target echoes within the main antenna lobe occurs through a space time adaptive processing--STAP--filter. The method uses a comparison of the amplitude amounts or power values of the range Doppler frequency cells with a threshold that can be specified in constant terms and summary of the resulting alarms. A target function is compared with defined test functions and selection criteria are determined from suitable combined calculation methods that are applied to the test and target functions for the purpose of classifying a respective target alarm as a moving or fixed target alarm. [A2207]

"Stationary object detection method for use with scanning radar"

A stationary object detection method for a scanning radar wherein, of peaks generated based on a radar signal reflected from a target, peaks having substantially the same frequency are grouped together, and a decision is made as to whether or not the frequency of the grouped peaks is equal to/higher than a predetermined value, and wherein if the peak frequency is equal to or higher than the predetermined value, then a decision is made as to whether or not the number of grouped peaks is equal to or greater than a predetermined number and, if the number of peaks is equal to or greater than the predetermined number, it is decided that the target is an overhead bridge candidate or an overhead bridge. Further, pairing is applied to peaks signals obtained from the target determined as the overhead bridge candidate, to detect a relative velocity with respect to the target, and if the relative velocity is substantially equal to the speed of a vehicle equipped with the radar, it is decided that the target is an overhead bridge. [A2208]

"Distance detecting device"

A distance detecting device for detecting a distance from objects with the use of wave signals determined by the distance measuring device and reflected from the objects, the distance detecting device comprising transmitter/receiver means for transmitting and receiving of wave signals with at least a first and a second transmitting/receiving unit which are spatially spaced from one another, with the first unit performing at least one transmitting functions and a second unit performing at least one receiving function, the both units being formed so that the second unit can receive wave signals emitted by the first unit as response signals, and either the function unit or the second unit can receive the wave signals emitted by the first unit as reflection signals, an interference determining device for determining at least one characteristic parameter of the response signal received in the second unit and for determining an interference based on the determined characteristic parameter. [A2209]

"Method for adjusting the speed of a motor vehicle"

A method for controlling the speed of a vehicle is proposed, where, in the vehicle to be controlled, the yaw rate or rotation rate is measured, in particular to determine the curvature of the vehicle's own travel trajectory, and where, using a proximity sensor or position sensor, at least one vehicle traveling ahead or at least some other object within a sensor's sensing range is detected, particularly with regard to an offset from the travel course of the vehicle to be controlled. By delaying the travel-course offset of a vehicle driving ahead, determined in preset measuring cycles, by a predefined time span, and by using the then instantaneous curvature of the travel trajectory, a historical travel-course offset is ascertained, one is able to simply and rapidly predict the travel course of the vehicle to be controlled. [A2210]

"Distance sensor with a compensation device for an angle misalignment on a vehicle"

A distance sensor having a sensor for a motor vehicle in which an arrangement is provided by which gnment angles and trajectory curvatures can be compensated for during travel not only on a straight road but also along curves. In a sensor mounted displaced from the center line of the vehicle, an angle (alpha_sensor) is measured which cuts the projected center line of the motor vehicle at the target object, a vehicle driving ahead. By the additional use of a yaw rate sensor, curve curvatures of the road are also compensated for, so that angle and distance measurement can also be made along curves. [A2211]

"Method and apparatus for determining a position of a transmitter in three dimensions"

In order to determine a position of a transmitter in three dimensions, a signal transmitted by the transmitter is received by four receivers that are separated from one another in three dimensions and are not all disposed on the same plane. In which case the time intervals between a reception of the signal by the four receivers are used to determine the position of the transmitter, taking into account the configuration of the receivers and a propagation speed of the signal in space. [A2212]

"Method and apparatus for radar-based level gauging"

A method for radar-based gauging of the level of a substance in a tank (13) having at least one interfering structure, e.g. a beam (16a) , an agitator (16b) or a tank side wall (16c) , comprises transmitting a microwave signal in a predetermined polarization state (LHCP) towards the surface (14) of the substance and the at least one interfering structure, detecting, separately in two different polarization states (LHCP, RHCP) , microwave signals (32, 33, 34) as reflected against the surface of the substance and against the at least one interfering structure, distinguishing based on signal strengths of the microwave signals detected separately in the two different polarization states, the detected microwave signal (32) , which has been reflected against the surface of the substance, and calculating based on a propagation time of the distinguished microwave signal the level of the substance in the tank. [A2213]

"Remote terminal location algorithm"

Various approaches for forming more accurate location estimates are disclosed. In some approaches, a plurality of preliminary location estimates are formed based on subsets of time-of-arrival measurements. A final location estimate is then made based on the preliminary location estimates. In other approaches, a quality indicator associated with the time-of-arrival measurements is modified, and subsequently used in a location algorithm. Optionally, multiple approaches may be used together. [A2214]

"Full polarization ground moving target indicator radar automatic target detection algorithm"

A method, apparatus, and system for automatic detection of targets from radar data are disclosed. Ground moving target indicator radar is used to collect radar data which is then filtered to suppress intensity of the clutter ridge. for each working point in a set of radar data, a working first-sense circular transmit/first-sense circular receive radar cross section, a working first-sense circular transmit/second-sense circular receive radar cross section, and a working asymmetry angle are calculated from a scattering matrix, then analyzed to classify the working point as a target point or a clutter point. This analysis suitably is performed by comparing data calculated for each working point to basis data collected in a look-up table in which combinations of a first-sense circular transmit/first-sense circular receive radar cross section, a first-sense circular transmit/second-sense circular receive radar cross section, and an asymmetry angle have been classified as target points or clutter points. [A2215]

"Reader and response control system for discrimination between multiple surface acoustic wave identification tags and method of operation thereof"

A system for discriminating between coded responses from multiple SAW identification tags and a method of operating such system. In one embodiment the system provides for a SAW tag reader subsystem that detects coded responses from the tags to an interrogation pulse, and a coded response analyzing subsystem, coupled to the SAW tag reader subsystem, that employs signal processing techniques to separate portions of the coded responses and generates possibilities for remaining portions of the coded responses. [A2216]

"Combined airbag inflation and occupant displacement enabling method and apparatus"

Combined airbag inflation and occupant displacement enabling system including a seat movably attached to a floor pan of the vehicle for supporting an occupant, an airbag which is inflated to protect the occupant during a crash, a sensor which detects that a crash requiring deployment of the airbag is required and an inflator which inflates the airbag. The inflator is coupled to the sensor and is triggered to inflate the airbag in response to the detection by the sensor of a crash requiring deployment of the airbag. The seat is arranged to move upon inflation of the airbag whereby movement of the seat causes displacement of the occupant. If an anticipatory sensor is provided, the seat can be designed to move at any time after a determination is made that a crash will occur. [A2217]

"Target vehicle identification based on the theoretical relationship between the azimuth angle and relative velocity"

A method for tracking a target vehicle through a curve in a roadway is disclosed. The method includes measuring an azimuth angle between the target vehicle and a host vehicle, calculating a relative velocity between the target vehicle and the host vehicle, developing a theoretical relationship, wherein the relationship is a function of the measured azimuth angle and the measured relative velocity, and comparing the developed theoretical relationship with measured relationship between the azimuth angle and the relative velocity. Further, the target vehicle is determined to be in the same lane or path of the host vehicle by evaluating how well the developed theoretical relationship fits the with the measured azimuth angle and calculated relative velocity. Therefore, the present invention determines the path of a target vehicle without relying on inaccurate conventional methods based on the yaw rate of the host vehicle. [A2218]

"Method and apparatus for estimation of forward path geometry of a vehicle based on a two-clothoid road model"

A method and apparatus for accurate estimation of forward path geometry of a vehicle based on a two-clothoid road model are presented. Road data provided by a camera or a radar system is collected 200 and a full measurement transfer function of the two-clothoid model is computed 202. The near-range and the far-range clothoid coefficients are estimated simultaneously 204, and the forward path of the vehicle is estimated using the data provided by the two-clothoid model 206. [A2219]

"Monopulse radar system"

To realize a monopulse radar system wherein the velocity of a mobile body, distance between an obstacle and the mobile body and relative velocity can be detected and simultaneously, the direction of the obstacle can be detected, in a monopulse radar system wherein an azimuth is detected depending upon amplitude difference or phase difference between signals respectively received by plural receiving antennas, an array antenna composed of plural antenna elements is used for each transmitting antenna and each receiving antenna, at least one of the transmitting antenna and the receiving antenna is provided with an antenna switch for switching an antenna beam shape to a short angle/long distance or a wide angle/short distance and a switch control device that controls the switching of the antenna switch is provided. [A2220]

"Combination of a feedthrough element for an electric high-frequency signal and a probe, and a level meter metering device including a combination of this type"

A combination includes a feedthrough element for an electric high-frequency signal in a TDR level metering device, and a probe for guiding the high-frequency signal from the feedthrough element to the filling product surface of a filling product to be measured and back. The feedthrough element includes at least one guiding element (6) , into which the electric high-frequency signal is to be fed at an inlet point (10) , and which transmits at an outlet point (17) the electric high-frequency signal to a probe (7) adapted to guide the high-frequency signal, a one-part or multipart mechanical carrier element (1) , and a one-part or multipart insulation (11, 12) present between the carrier element (1) and the guiding element (6) . In the combination the impedance of the feedthrough element and the impedance of the probe (7) following the outlet point (17) are substantially matched to each other at the outlet point (17) . [A2221]

"Externally deployed airbag system"

Externally deployed airbag system for a vehicle including one or more inflatable airbags deployable outside of the vehicle, an anticipatory sensor system for assessing the probable severity of an impact involving the vehicle based on data obtained prior to the impact and initiating inflation of the airbag (s) in the event an impact above a threshold severity is assessed, and an inflator coupled to the anticipatory sensor system and the airbag for inflating the airbag when initiated by the anticipatory sensor system. The airbag may be housed in a module mounted along a side of the vehicle, in a side door of the vehicle (both for side impact protection) , at a front of the vehicle (for frontal impact protection) or at a rear of the vehicle (for rear impact protection) . Also, the externally deployed airbag can be deployed to cushion a pedestrian's impact against the vehicle. [A2222]

"Safe distance algorithm for adaptive cruise control"

In accordance with the present invention, an adaptive cruise control system includes a radio frequency (RF) transmit receive (TR) sensor module (or more simply "sensor") disposed such that a detection zone is deployed in front of a vehicle. The sensor includes a sensor antenna system which comprises a transmit antenna for emitting or transmitting an RF signal and a receive antenna for receiving portions of the transmitted RF signal which are intercepted by one or more objects within a field of view of the transmit antenna and reflected back toward the receive antenna. With this particular arrangement, a detection system that detects objects in a region about a front of a vehicle is provided. If the system determines that the vehicle is approaching an object or that an object is approaching the vehicle, then the sensor initiates steps that are carried out in accordance with a set of rules that control an accelerator of the vehicle. The accelerator is adjusted to maintain a safe trailing distance behind the detected object. [A2223]

"Radar system for detecting relative velocity and relative speed of a preceding vehicle"

A diplex Doppler type radar system which can detect a preceding vehicle even when the range rate (e.g. a relative velocity, a relative distance) of a preceding vehicle relative to a vehicle having the radar system is small. A Radar system is mounted on a vehicle, the transmit antenna alternately transmits two signals on different frequencies. When the transmitted signals met an object (a preceding vehicle) and reflected, the reflected signals are received by a receive antenna. Usually, The first A/D converter digitizes IF signals (said received signals) and the DSP (digital signal processor) frequency-analyzes the digitized signals to compute the range rate of the preceding vehicle. When a peak spectrum exists in a low frequency range below a preset threshold as the result of the frequency analysis, the IF signals are digitized by the second A/D converter which has a higher sampling resolution than that of the second A/D converter. The digitized IF signals are frequency-analyzed by the system control microcomputer 115. Thus the range rate (e.g. a relative velocity and a relative distance between the preceding vehicle and the following vehicle) of the preceding vehicle is computed. [A2224]

"Motor vehicle trajectory measurement"

The present invention relates to measurement of the trajectory of a motor vehicle with respect to a roadway. A trajectory measurement system for a motor vehicle (1) , comprises a sensing system (20, 21) for sensing the positions of roadway edges (5) , a memory (24) that stores data relating to the width, and optionally lane width, of different types of road (4) on which the vehicle (1) may travel, and a data processor means (2) linked (26, 29) to the sensing system (20, 21) and memory (24) . The processor means (2) compares the sensed positions of roadway edges (5) with the road width data in order to deduce the type of road (4) on which the vehicle (1) travels, and optionally also the lane in which the vehicle travels. The system may also include a vehicle speed sensor (13, 15) linked (33, 35) to the data processor means (2) . The memory (24) then stores road speed data relating to different type of road (4) on which the vehicle (1) may travel, so that the processor means (2) can compare also the sensed vehicle speed with the road speed data in order to help deduce the type of road (4) on which the vehicle (1) travels. [A2225]

"Radar apparatus in which the direction of the antenna is recognizable from outside"

A radar apparatus is provided in which an antenna axis and vehicle axis can agree with each other even when the antenna face is covered with a cover. In an assembling process of the radar apparatus composed of a chassis, an antenna incorporated in the chassis and a cover attached to the chassis to cover the antenna, a correlative positional relation between an antenna axis of the antenna incorporated into the chassis and one portion of the chassis or bracket is detected, and the thus detected data is inscribed on a seal and the seal is stuck to the chassis or the data is stored in an internal memory, and the chassis into which the antenna is incorporated is covered with the cover, so that the radar apparatus is manufactured. When this radar apparatus is attached to a vehicle, the antenna axis can be adjusted parallel to the vehicle axis by utilizing data of a correlative positional relation between the antenna and one portion of the chassis or bracket. [A2226]

"Distancing and positioning systems and methods"

A distancing system for determining a distance between first and second locations comprising mobile and fixed units. The mobile unit is arranged at the first location and comprises first receive and first transmit portions operating at respective first and second frequencies, first and second baseband processors operating based on first and second clock signals, and a first control portion. The fixed unit is arranged at the second location and comprises second receive and transmit portions operating at the respective second and first frequencies, a third baseband processor operating based on a third clock signal, a second control portion, and a mode switch. The configuration of mode switch circuit allows communication between the fixed and mobile units or a determination of the distance between first and second locations. [A2227]

"Systems and methods for target location"

A method of determining a target location from a vehicle is described. The method includes identifying the target utilizing a video system, determining an angular location vector to the target with respect to the vehicle, determining a position of the vehicle utilizing a digital terrain elevation map and precision radar altimeter, calculating a location where the angular location vector would intersect with the digital terrain elevation map, and generating a target position based on vehicle position and the location of the intersection of the angular location vector and digital terrain elevation map. [A2228]

"System and method for displaying radar data"

A system for displaying radar data from two or more areas of interest is provided, such as for simultaneously showing vehicle speeds in the opposite lane in front of the patrol vehicle and in the same lane behind the patrol vehicley. The system includes a first display that shows the speed of vehicles in the first area, such as the opposite lane in front of the patrol vehicle, and a second display that shows the speed of vehicles in the second area, such as the same lane behind the patrol vehicle. [A2229]

"Distance sensitive remote control systems"

A distance sensitive remote control system includes a remote control transmitter that transmit a signal and a receiver than can receive the signal from the transmitter. A control device performs a function having a first and a second option. The control device responds to the signal received by the receiver and performs the first option if the distance between the remote control transmitter and the receiver is greater than a particular distance and performs the second option if the distance between the remote control transmitter and the receiver is less than a particular distance. [A2230]

"Blind spot detector"

A warning device for mounting onto a vehicle, in order to attract the attention of the driver when another vehicle (2) or object is located in a position that is wholly or partially critical for the driver. The device comprises two sources (5, 6) of laser radiation arranged at a distance from each other, a convex lens (8) arranged outside of each source and a position-sensitive radiation detector (7) arranged between the sources (5, 6) . The device reacts with different levels of warning signals on the detection of direction indicator (58) , angular deviation (60) of a wheel or the steering wheel, speed (62) , etc., in combination. [A2231]

"Positioning system"

The invention provides a positional system intended to supplement positional information derived by means of a Global Positioning System (GPS) , so as to provide positional data coverage in situations where the GPS data may be unreliable, for example due to local attenuation of satellite signals, in order to permit members of a group traversing difficult terrain to retain reasonably accurate information as to the whereabouts of the other group members should the GPS system fail. The positional system of the invention provides each group member with a readily transportable and relatively inexpensive inertial navigation system to generate approximate positional data and utilises radio location techniques to improve the accuracy of the approximate positional data. [A2232]

"Signal process apparatus for an on-vehicle radar and method thereof"

The invention provides a signal process apparatus for an on-vehicle radar and a method thereof that can reduce operation load and obtain a sufficient detection capability. According to information on a detected object, the invention registers as peak data a frequency BIN contained in a frequency region around a prediction peak that is to be detected on a distance power spectrum. The invention predicts a running line on which a predetermined vehicle runs, obtains a power spectrum along the running line, and registers as peak data the peak of the power spectrum. Then, the invention averages the distance power spectrum obtained for each channel, registers as peak data the peak of the averaged distance power spectrum, and only with regard to the registered peak data (frequency BIN) , seeks a directional power spectrum. [A2233]

"Electrically powered postage stamp or mailing or shipping label operative with radio frequency (RF) communication"

The present application describes an electronically powered postage stamp or mailing label and including a radio frequency identification (RFID) device and system mounted between the opposing and facing major surfaces thereof. The RFID device and system includes an integrated circuit transceiver chip which is connected to and powered by a thin flat battery cell and is operated with a thin film RF antenna, all of which are mounted in side-by-side relationship on a thin base or support layer. These thin flat components are mounted in an essentially two dimensional planar configuration well suited for incorporation into the planar structure of a postage stamp or a mailing label. In addition, the RFID transceiver chip may be replaced with an electro-optically operated IC chip using, for example, LEDs or laser diodes for the propagation of light signals to an interrogator. [A2234]

"Methods and apparatus for weighting radar return data"

A method for reducing effects of terrain return fading due to summation of out of phase radar returns in determining locations of radar targets is described. The method comprises determining an interferometric angle, .PHI., to a radar target based on at least one radar return and filtering the interferometric angle, .PHI., by adjusting an effect of terrain features contributing to the interferometric angle, .PHI., proportionally to a degree of radar return fading resulting from the terrain features of the radar targets. A corrected interferometric angle, .PHI..sub.out., is then provided, based at least in part on the filtering. [A2235]

"Ground elimination technique in vertical profile radar displays"

A method and system for suppression of ground returns in a vertical profile radar display. The method includes receiving radar returns each comprising a plurality of range bins collated to a vertical profile radar display. The received range bins are analyzed to locate ground returns. A plurality of range bins are selected based upon the located ground returns. The radar returns are modified based upon the selected range bins. [A2236]

"Spatially resolved and spatially aware antenna for radio navigation"

A method and apparatus for radio navigation and location is disclosed. The method uses an autonomous, on-board micro-inertial navigation system to propagate the state of a station, and an angularly resolvable antenna to measure relative orientation and relative range and to receive estimated state information from one or more companion stations. Optimally estimated state information is used to permit operation in environments that are otherwise hostile to communications between stations. [A2237]

"Telematics system"

Vehicular telematics system including an occupant sensing system for determining a property or characteristic of occupancy of the vehicle constituting information about the occupancy of the vehicle and a communications device coupled to the occupant sensing system for transmitting the information. The occupant sensing system may include sensors, for example, an image-obtaining sensor for obtaining images of the passenger compartment of the vehicle, a motion sensor, receivers arranged to receive waves, energy or radiation from seating locations in the passenger compartment, heartbeat sensors, weight sensors associated with seats in the vehicle and/or chemical sensors. Vehicle sensors may be provided, each sensing a state of the vehicle or a state of a component of the vehicle. The communications device is coupled, wired or wirelessly, directly or indirectly, to each vehicle sensor and transmits the state of the vehicle or the state of the component of the vehicle. [A2238]

"Ultra wideband communication system, method, and device with low noise pulse formation"

An ultra-wide band (UWB) waveform generator and encoder for use in a UWB digital communication system. The encoder multiples each data bit by an n-bit identifying code, (e.g., a user code) , resulting in a stream of bits corresponding to each data bit. This stream of bits is referred to as the original codeword. The original codeword is passed onto the UWB waveform generator for generation of a UWB waveform that can be transmitted via an antenna. The UWB waveform is made up of shaped wavelets. In one embodiment, the wavelets are bi-phase wavelets, and the UWB waveform generator uses a two-stage differential mixer and a pulse generator. The first stage combines the pulses from the pulse generator with a first derivative codeword derived from the original codeword. The output of this first stage is a wavelet, which is used as input to the second differential mixer along with a second derivative codeword also derived from the original codeword and orthogonal to the first derivative codeword. The output of the second mixer is a wavelet, which represents an inversion of the original codeword. This wavelet is then passed on to an inverting amplifier before it is transmitted via an antenna. By using two derivative codewords at one-half the chipping rate of the original codeword, less power is consumed. An advantage of the two stage mixer system is that it suppresses the noise generated and transmitted by the system. [A2239]

"Level measuring device operating with microwaves"

The microwave measuring device, which preferably operates with microwave bursts, serves to produce a measured value (X.sub.H) representing the level of the contents of a vessel (200) . It comprises a transceiver unit (2) for generating a level-dependent intermediate-frequency signal (ZF) by means of a transmit signal (S.sub.2) and a receive signal (E.sub.2) , and a transducer element (1) which in operation couples waves (S.sub.1) , particularly pulsed waves, into the vessel under control of the transmit signal (S.sub.2) and converts echo waves (E.sub.1) reflected from the contents (201) of the vessel into the receive signal (E.sub.2) . The intermediate-frequency signal (ZF) is fed to a control unit (3) of the level measuring device where it is stored in the form of a sampling sequence (AF) in a volatile data memory (33) . In this manner, both amplitude information and phase information is available for the level measurement. The device is thus capable of measuring level with high accuracy, particularly accurately to a millimeter, and very fast. [A2240]

"Polarametric blind spot detector with steerable beam"

A blind spot detection system includes a transmitter directing a circularly polarized signal into a blind spot adjacent a vehicle. A receiver also mounted on the vehicle receives a reflection of the circularly polarized signal which is oppositely circularly polarized. An indicator indicates to the driver of the vehicle when the reflected signal is detected, thereby indicating the presence of an object in the blind spot. An indicator is also directed toward the blind spot generating a warning when the presence of an object in the blind spot is detected and an indication of a turn or lane change by the vehicle is detected, such as turn signal switch activation. [A2241]

"Distance measurement using half-duplex RF techniques"

A system, apparatus, and method for determining the distance between two objects using an indirect propagation delay measurement is disclosed. A frequency hopping scheme (such as the Bluetooth.TM. technology) is used to measure the relative phase offset of the received signal between the various frequencies. for a given distance between the objects, the phase offset vs. frequency curve is a straight line with the slope dependent upon the measured distance. After the phase of the received signals is detected, the data is plotted on a curve and the slope is calculated. A wireless slave device remains phase locked with another device in a half-duplex communication mode by employing a low-drift phase locked loop employing a voltage controlled crystal oscillator. The phase locked loop further employs a mechanism that provides immunity from transitory phase slip at a time when the loop is opened. [A2242]

"Method of calculating the position of a mobile radio station based on shortest propagation time"

In a location method based on distance measurements, the distance between a mobile station and a base station is measured by finding the one-way propagation time between the two radio stations. This one-way propagation time is obtained by sending a location signal and measuring its time of arrival. In order to mitigate inaccuracy due to use of measurements corresponding to reflected radio paths which are longer than direct radio paths, a method is proposed to ensure that the distance calculation will be done by using the first time of arrival of the location signal. The first time of arrival corresponds to a propagation through the shortest radio path, which is likely to be the direct path. The first time of arrival is determined by using a location signal which includes a plurality of identical messages, and by combining these messages on reception in order to obtain a signal of higher energy of which the shortest path is detected. [A2243]

"Object detection system providing driver information through sound"

A vehicle object detection system is disclosed that audibly conveys to the vehicle operator the direction of the detected object relative to the vehicle through the vehicle's audio system. The system includes a sensor array, a processor, and a speaker arrangement. The sensor array detects an object remote from the vehicle and generates a signal when an object has been detected. The processor receives and processes the sensor array signal. Then, the processor transmits the processed signal to the speaker arrangement. The speaker arrangement audibly conveys the processed signal over multiple audio channels. The method of detecting an object remote from the vehicle is also disclosed. The method involves detecting an object remote from the vehicle, determining information relating to the object, determining whether the information relating to the object meets certain criteria and, if certain criteria are met, transmitting sound over multiple audio channels to audibly convey object information through the vehicle's audio system, and modulating the sound outputted to give the driver directional cues for the position of the object. [A2244]

"Ultrasonic transmitter/receiver by pulse compression"

As shown in FIG. 2 (a) , according to the present invention, a quartz rod is used where, for example, the diameter of the end on the side to which an ultrasound probe attached is 0.58 mm, the diameter at the narrowest portion is 0.3 mm, the diameter at the end on the specimen side is 0.68 mm, and the length is 38 cm. As a result, the diameter on the side of fused quartz rod 20 to which ultrasound transducer 10 allows a favorable range of L (0,3) mode conversion efficiency, and in addition, the diameter of quartz rod 20 on the side coming into contact with specimen 50 is sufficiently large in comparison with wavelength, and in other portions it is set to be sufficiently narrow in order to obtain flexibility. FIG. 2 (b) shows a transmission and a reception waveform. [A2245]

"Method for determining a danger zone for a pre-crash sensing system in a vehicle having a countermeasure system"

A pre-crash sensing system (10) for a source vehicle (50) having a source vehicle length and a source vehicle width that is coupled to a countermeasure system (30) is described. The system includes an object sensor (17) having a radar sensor (18) generating an object distance signal and an object relative velocity signal, and a vision system (20) generating an object classification signal. A controller (12) is coupled to the object sensor for activating the countermeasure system (30) based on the object distance, relative velocity and the object classification signal. [A2246]

"Method and device for detecting objects"

A method and a device for detecting objects that has at least two near distance sensors installed on a vehicle. The at least two near distance sensors have detection ranges that overlap at least partially. The relative positions of possible detected objects with respect to the at least two near distance sensors are determined in the overlap area by the triangulation principle. Possible apparent objects obtained by determining the relative position of possible detected objects are identified using dynamic object monitoring. [A2247]

"Interference suppression circuit and method thereof for multi-channel receivers"

The Electronic Support Measure (ESM) system is disclosed having various embodiments all of which reduce or even eliminate the detrimental effects caused by interference signals commonly generated by CW emitters. [A2248]

"Detecting system having a coherent sparse aperture"

A system and method for detecting a target object through foliage includes a transmitter for generating a low-frequency electromagnetic signal. The signal is directed toward a potential target object for reflection from the potential target object. The system further includes a plurality of mutually dispersed sensors for receiving the reflected signal from the target object. A mechanism is provided to determine the relative locations of the sensors. Signal information from the received signals is sent to a central processor. The central processor inputs the signal information into a beamformer algorithm such as the Maximum Likelihood Method (MLM) to reduce sidelobe ambiguities and resolve the true location of the target from the signal information. [A2249]

"Determining three dimensional velocity of a object"

A velocity determination system determines a three dimensional velocity of an object wherein the three dimensional velocity comprises a radial velocity and a transverse velocity. A velocity determination system receives a first signal from the object. The velocity determination system then receives a second signal from the object. The velocity determination system then correlates the first signal and the second signal. The velocity determination system determines the radial velocity based on a ratio of the correlation of the first signal and the second signal. The velocity determination system then determines a transverse velocity based on a ratio of the correlation of the first signal and the second signal in a forward mode and a backward mode along a transverse direction. [A2250]

"Distance-related method for controlling the speed of a vehicle"

A method for controlling the speed of a vehicle is proposed, where, in the vehicle to be controlled, the yaw rate or rotation rate is measured, in particular to determine the curvature of the vehicle's own travel trajectory, and where, using a proximity sensor or position sensor, at least one vehicle traveling ahead or at least some other object within a sensor's sensing range is detected, particularly with regard to an offset from the travel course of the vehicle to be controlled. From the detection of one or of a plurality of objects, the curvature of the vehicle's own travel trajectory may be corrected with a view to a prediction of an expected curvature from the averaging of the positional changes ascertained at the plurality of the objects. [A2251]

"Method and arrangement for communicating between vehicles"

Method for transferring information between a vehicle and a transmitter in which a unique pseudorandom noise signal is transmitted by the transmitter in a carrier-less fashion composed of frequencies within a pre-selected band. Information is encoded in the noise signal relating to an identification of the transmitter and a position of the transmitter and the vehicle is provided with a device for extracting the information from the noise signal. The code to use for encoding the noise signal may be selected based on the position of the transmitter so that analysis of the code, or a portion thereof, provides an indication of the position of the transmitter. Information about accidents, weather conditions, road conditions, map data and traffic control devices and about errors in a GPS signal can also be encoded in the noise signals. The transmitter may be at a fixed location or in another vehicle to thereby enable vehicle-to-vehicle communications for the purposes of collision avoidance, intelligent highway applications and the like. [A2252]

"Pri-staggered post-doppler adaptive monopulse processing for detection and location of a moving target in ground clutter"

A method, apparatus, and processing system for radar detection and tracking of a target using monopulse ratio processing comprising the following steps. First, receiving a signal comprised of a plurality of sum azimuth beams and difference azimuth beams. Then staggering the received signal. Next, filtering and localizing a clutter signal which is a portion of the received sum and azimuth beams. Then adaptively forming a sub-array sum azimuth beam and a sub-array difference azimuth beam from the filtered output to cancel the clutter. The adaptive beam forming including the determination of a sum and difference beam weight where the adaptive weight be equated to a product of the weight and the respective covariance matrices of the sum and difference beams, the product having no constraint points. Finally, forming a final sum azimuth beam and final difference beam where the first sub array is related to the sum and azimuth beams of a plurality of other sub-array sum and difference beams, an overall final sum beam is formed and is used for target detection. In addition, an overall final difference beam is formed and the ratio of the overall final difference beam to the overall final sum beam is used for angle location determination. [A2253]

"Radar apparatus"

A radar apparatus provided with a transmitter for periodic transmission of mutually disjunct groups of N radar transmitter pulses and provided with a receiver for the receipt of echo signals of the groups of radar transmitter pulses. The radar apparatus includes a video processor for processing echoes in a listening time observed between two of the mutually disjunct groups of radar transmitter pulses. By choosing a suitable staggering of the pulses in a group, the target range and velocity may be unambiguously determined. [A2254]

"Methods and apparatus for detecting concealed weapons"

Methods and Apparatus for early detection and identification of a threat, and alerting against detected threats, such as individuals wearing or carrying explosive materials and/or weapons, e.g., suicide bombers and other terrorists, at a great enough distance to limit loss of life and destruction of property are disclosed. The methods comprise transmitting a signal in the direction of a potential threat, measuring the detected reflected signal, and comparing the signal level with a threshold indicative of a threat. A monitor is employed to display the threat and attributes of the detected signals. The invention further illuminates the suspicious individual (s) with a Laser illuminator/designator and provides information about the distance to the suspicious individual (s) . [A2255]

"Method for correcting the visual range of a distance sensor that is assembled in such a way that said sensor is offset from the center line of a motor vehicle"

A method for correction of the detection range of a distance sensor, which is installed with an eccentricity laterally offset with respect to the central axis of a motor vehicle. In order to correct the detection range, a correction angle is used, with which the eccentricity of the distance sensor is corrected at the time of its installation. Thus the distance sensor is not aligned parallel to the longitudinal axis of the vehicle, but to its central axis. Thus, the detection range is advantageously covered approximately symmetrically to the longitudinal axis of the vehicle. The correction angle is determined either empirically, via appropriate test measurements, or mathematically. [A2256]

"Hybrid bluetooth/RFID based real time location tracking"

Devices having either wireless data communication capability or RFID tags can be located using dual function fixed devices which are distributed throughout a facility. The devices will identify those units with which they are communicating using a wireless radio data communications protocol and also identify items within the local area using RFID tags on the units. [A2257]

"Method and apparatus for controlling deployment of a side airbag"

An arrangement and method for controlling deployment of a side airbag from an airbag module to protect an occupant in a seat of a vehicle in a crash. The presence of an occupant and/or position of the occupant or a part thereof is/are determined and deployment of the side airbag is controlled based thereon. To determine the presence of the occupant and/or position of the occupant or part thereof, a transducer is arranged to receive waves from a space above a seat portion of the seat and a signal representative of the presence and/or position of the occupant is generated based on the waves received by the transducer. The transducer can be designed to transmit waves into the space above the seat portion of the seat which are also receivable thereby. The transducer may be mounted in a door of the vehicle to enable the distance between the occupant and the door to be determined, i.e., to determine whether the occupant is leaning against the door, and possibly adjacent the airbag module if it is situated in the door. In these cases, deployment of the side airbag can be suppressed. In the alternative the time at which deployment of the side airbag starts, the rate of gas flow into the side airbag, the rate of gas flow out of the side airbag and/or the rate of deployment of the side airbag is/are controlled. [A2258]

"System and method for intrusion detection using a time domain radar array"

A system and method for highly selective intrusion detection using a sparse array of time modulated ultra wideband (TM-UWB) radars. Two or more TM-UWB radars are arranged in a sparse array around the perimeter of a building. Each TM-UWB radar transmits ultra wideband pulses that illuminate the building and the surrounding area. Signal return data is processed to determine, among other things, whether an alarm condition has been triggered. High resolution radar images are formed that give an accurate picture of the inside of the building and the surrounding area. This image is used to detect motion in a highly selective manner and to track moving objects within the building and the surrounding area. Motion can be distinguished based on criteria appropriate to the environment in which the intrusion detection system operates. [A2259]

"Safe distance algorithm for adaptive cruise control"

In accordance with the present invention, an adaptive cruise control system includes a radio frequency (RF) transmit receive (TR) sensor module (or more simply "sensor") disposed such that a detection zone is deployed in front of a vehicle. The sensor includes a sensor antenna system which comprises a transmit antenna for emitting or transmitting an RF signal and a receive antenna for receiving portions of the transmitted RF signal which are intercepted by one or more objects within a field of view of the transmit antenna and reflected back toward the receive antenna. With this particular arrangement, a detection system that detects objects in a region about a front of a vehicle is provided. If the system determines that the vehicle is approaching an object or that an object is approaching the vehicle, then the sensor initiates steps that are carried out in accordance with a set of rules that control an accelerator of the vehicle. The accelerator is adjusted to maintain a safe trailing distance behind the detected object. [A2260]

"Method and system for generating weather and ground reflectivity information"

A method, system, and computer program product for storing weather radar return data into a three-dimensional buffer. The system includes a radar system that transmits a radar signal and generates a radar measurement as a result of radar return of the transmitted radar signal. A three-dimensional buffer includes a plurality of storage locations. A processor is coupled to the radar system and the buffer. The processor generates or updates a reflectivity value in storage locations in the three-dimensional buffer based on the generated radar measurement, a previously stored reflectivity value for the storage location, and at least one of an uncertainty value for the storage location. The generated reflectivity value is stored in the three-dimensional buffer according to the storage location. [A2261]

"Docking information system for boats"

A docking information system disposed on a ship provides navigational information to the operator of the ship. The system includes a short range radar system and a display to provide a range between the ship and a dock or an obstacle and, optionally, a relative velocity between the ship and the dock or the obstacle. [A2262]

"Method and system for tracking multiple objects"

An improved method and system for solving a combinatorial optimization problem, such as a tracking problem, to define a plurality of associations of measurements taken of a plurality of objects is provided. In one aspect, a method, a system and a computer program product are provided for constructing a plurality of updated tracks by solving a Lagrangian dual in which each of the measurement constraints has been relaxed. In another aspect, a hybrid branch and bound and LR technique is provided to select a plurality of updated tracks from among a plurality of candidate tracks having respective initial costs. In this regard, a search tree of the candidate tracks is ordered based upon the initial costs of the candidate tracks as adjusted by the dual variables that have been defined as a result of solving a Lagrangian dual. In order to attempt to increase the efficiency with which a Lagrangian dual is solved by nonsmooth optimization techniques, initial values for the dual variables and some of the subgradients are judiciously selected. The dual variables are initialized and some subgradients are provided based upon values of corresponding dual variables and some of the subgradients, respectively, that were determined during the solution of the prior problem. The method and system can be implemented in a parallel processing architecture that utilizes both coarse grain and fine grain techniques to evenly schedule a number of subproblems amongst a plurality of processors in order to obtain a solution in an efficient manner. [A2263]

"Distance measuring device"

From a transmitter (18) and a transmission antenna (10) , a first frequency signal having a fixed frequency is transmitted for a predetermined time or more, a second frequency signal having a certain frequency difference from the first frequency signal is transmitted for a predetermined time or more, and a third frequency signal having a frequency difference twice the frequency distance from the first frequency signal is transmitted for a predetermined time or more. Reflected waves from objects under measurement at the respective transmission frequencies are supplied to a reception antenna (11) , a mixer (12) , an analog circuit unit (13) , an A/D converter (14) , an FFT (15) and a signal processing unit (16) . Then, the Doppler frequencies are measured for the reflected waves, objects under measurement are separated and detected at each Doppler frequency, and objects under measurements having the same Doppler frequency are separated to identify a plurality of objects under measurement from phase information and amplitude information of received signals acquired at each transmission frequency. In this manner, when there are a plurality of objects under measurement which are substantially equal in relative speed, these can be separated from each other and detected. [A2264]

"Interrogation of an object for dimensional and topographical information"

Disclosed are systems, methods, devices, and apparatus to interrogate a clothed individual with electromagnetic radiation to determine one or more body measurements at least partially covered by the individual's clothing. The invention further includes techniques to interrogate an object with electromagnetic radiation in the millimeter and/or microwave range to provide a volumetric representation of the object. This representation can be used to display images and/or determine dimensional information concerning the object. [A2265]

"Multi-friction sleeve penetrometer apparatus and method"

Disclosed are apparatus and method for determining interface strength in situ. In one embodiment, the apparatus includes a plurality of load cells, wherein each load cell obtains an in situ measurement of interface strength at each measurement depth that corresponds to location of each load cell on the attachment module. Each load cell obtains the in situ measurement of interface strength without using the measurement data of a penetrating tip member. In another embodiment, an apparatus for determining interface strength in situ comprises an attachment module coupled to a penetrating tip, wherein the attachment module includes a plurality of load cells. Each load cell includes a friction sleeve, which the friction sleeve of at least one load cell is configured with a different surface texture than another load cell. [A2266]

"Subsurface imaging system and method"

A portable structure supports a subsurface imaging system and is moveable over a given imaging site. At least a first antenna of a plurality of antennae is oriented in a manner differing from an orientation of a second antenna of the plurality of antennae, such as the first antenna being orientated substantially orthogonal to the second antenna. The antennae may operate in a bi-static mode. Transmitter and receiver circuitry, coupled to the antennae, respectively generates electromagnetic probe signals and receives electromagnetic return signals resulting from the probe signals. A processor processes the received electromagnetic return signals. A display may be provided as part of the subsurface imaging system and/or as part of a processing system separate from the subsurface imaging system which processes the received electromagnetic return signals. The processor can generate two-dimensional and/or three-dimensional detection data using the received electromagnetic return signals. [A2267]

"Motion detection and alerting system"

A compact, autonomous motion detecting and alerting system alerts to the movement of objects of interest. Mounted on an environmentally sealed PC board are a transceiver such as a CW radar front-end, connectors, signal processors and a communications device. The system provides early warning of movement of an ice sheet or rubble field via the communication device that may be a cellular telephone. This system is mounted proximate the target surface under observation, oriented at pre-specified offset angles both laterally and in elevation. The target is illuminated and energy reflected therefrom is mixed with a portion of the transmitted signal to produce a difference frequency signal that is processed to establish existence of motion within a pre-specified velocity range. Upon verification of motion, notification is sent to a responsible authority. An autonomous or semi-autonomous power source and integral power management function may be incorporated on the same PC board. [A2268]

"Method and apparatus for identifying buried objects using ground penetrating radar"

An apparatus for identifying a buried object using ground penetrating radar (GPR) in a system containing at least one GPR sensor, comprises a data processor for detecting spatial correlations in data received from a GPR sensor in the apparatus and an image processor capable of building a data structure corresponding to an image of the buried object from data processed by the data processor. A method for identifying a buried object using GPR in a system containing a GPR sensor comprising detecting spatial correlations in data received from the GPR sensor in the system and building a data structure corresponding to an image of the buried object from the received data. [A2269]

"Device for transmitting data in a motor vehicle"

A device for data transmission in a motor vehicle and/or from a motor vehicle in its vicinity includes a first transceiver unit in or on the motor vehicle and a second transceiver unit. which is provided in at least one transponder unit whose spatial position relative to the vehicle may be variable or any desired position. In the first transceiver unit is a radar unit equipped for distance measurement, expanded by adding a two-channel data transmission system. The second transceiver unit is also a two-channel data transmission unit, and the microwave frequencies for two-channel communication of the data transmission system are selected so that their difference yields an intermediate frequency which is processable using conventional components in a heterodyne receiver in the reception part of each of the first and second transceiver units. [A2270]

"Vehicular traffic sensor"

A vehicle traffic sensor for detecting and monitoring vehicular targets is presented. The sensor employs a planar design resulting in a reduced profile sensor. The sensor includes a multi-layer radio frequency board with RF components on one of the sides and both isolation and planar array antennas on the opposing side. The antennas are preferably tapered planar array antennas which include one transmit antenna and one receive antenna. The sensor also includes at least one logic or signal processing board populated with components on a first side and a ground plane on a second side positioned toward the RF componentry of the RF board to form an RF shield. The boards are housed within a housing that is permeable, at least on the side through which the antenna structures propagate. [A2271]

"Device location and identification system"

A method and system for identifying panels that embed active and passive components of an electronic device, or that hide certain key components of a building's infrastructure in the plenum of the ceiling. In one aspect, a panel is provided with a phosphorescent or other light-responsive indicia that is representative of an object hidden within the panel or that is part of the building infrastructure hidden by a plurality of panels. A panel having a device embedded within it is identified by first placing a light-responsive indicia on the panel that is representative of the devices stored therein or the building infrastructure lying above it. The panel is then irradiated and the light-responsive indicia observed. In another aspect, a panel having an embedded object is provided with an indicator device that is embedded in the same panel. The indicator detects a query signal emitted by a scanner, compares the detected signal with information stored in the memory of the indicator, and if a match is found, emits a visible or audible signal from a signal output device into the room below. The signal output device can be a light emitting diode or a sound generator. [A2272]

"System and method for communicating with dormant radio frequency identification tags"

The position of a radio frequency identification (RFID) transponder may be determined with respect to a plurality of stationary sensors located in an array within certain physical areas. Each sensor comprises a plurality of antenna coils arranged in unique physical orientations and capable of transmitting radio frequency signals of differing phase. The RFID transponder includes an antenna which receives the plurality of signals generated by the antenna coils, and compares the phase of at least two of the signals to determine the relative position of the transponder. The location of the transponder with respect to two or more sensor (s) may also be determined through measurement of the intensity of the signals received by the antenna coil of the transponder. The system and method may also transmit data between a sensor and a dormant (motionless) RFID transponder using a hand-held high intensity RF probe. [A2273]

"Method and device for identifying the state of a system for effecting the automatic longitudinal and/or lateral control of a motor vehicle"

Method and device for state estimation in a system for automatic longitudinal and/or transverse regulation in a motor vehicle, operating according to the radar principle and/or the lidar principle, in particular for detecting soiling and/or blindness of a sensor is disclosed. The state estimation is dependent upon at least two indicators, which are formed from the signals received and/or transmitted by the sensor. [A2274]

"Time domain reflectometry measurement instrument"

A time domain reflectometry measuring instrument uses a microprocessor that provides added functionality and capabilities. The circuit electronics and probe are tested and calibrated at the factory. Installation and commissioning by the user is simple. The user installs the probe. The transmitter is attached to the probe. The user connects a standard shielded twisted pair to the electronics. Power is applied and the device immediately displays levels. A few simple parameters may need to be entered such as output characteristics and the process material dielectric constant. [A2275]

"Terrain database based ground return suppression"

The present invention comprises a system, method, and computer program product for suppressing terrain returns in weather radar images. A weather radar display system includes a memory, a terrain database, a display, and a display processor coupled to the memory, terrain database, and the display. The display processor includes a first component configured to extract radar return data stored in the memory based on aircraft position, a second component configured to extract data stored in the terrain database based on aircraft position, and a third component configured to selectively accept or discards or otherwise segregates data for display based upon the data extracted from memory and the data extracted from the terrain database. [A2276]

"Vehicle with position detector"

The position of a vehicle is to be detected accurately while suppressing the consumption of a battery. In accordance with instructions given from a position detection service center a base station issues requests at certain intervals. A vehicle V, upon receipt of a request, issues an answer signal containing ID information. On the basis of the answer signal the position detection service center decides the position of the vehicle V and offers the position information to a control center on demand. Electric power is supplied from a vehicular battery to an answer signal issuing member installed in the vehicle V. Even after a main power supply switch is turned OFF, the supply of electric power from the battery is continued, thus permitting an answer to a request from the base station. Consequently, the control center can determine a vehicular stop position accurately. [A2277]

"Method and system for determining driving environment"

When a reflective wave reflected from a preceding object is received, the reflective wave being of an original radar beam scanned at a variable vertical angle, the vertical angle is detected, an absolute speed of the preceding object is calculated based on a vehicle speed and a relative speed calculated from the reflective wave, and accordingly a driving environment is determined based on the vertical angle and the absolute speed. [A2278]

"Radar sensor and radar antenna for monitoring the environment of a motor vehicle"

A radar sensor and a radar antenna are for monitoring the environment of a motor vehicle. A compact construction is achieved by the planar array of both the control circuit and the radar antenna, so that the radar sensor may be located, for example, in the area of a motor-vehicle bumper. Example configurations consist of the separate line support for arranging lines to transmit high-frequency signals between the control circuit and the radar antenna and the configuration of the radar antenna as a Rotman lens, in relation to the signal propagation times and the layered arrangement of Rotman lens and group antenna. [A2279]

"Vehicle control method and vehicle warning method"

In order to occur a collision warning to prevent the collision in accurate by detecting the preceding vehicle or target, a vehicle lane position estimation device comprising a means for measuring a distance between said host vehicle and said preceding vehicle or a oncoming vehicle, a direction angle from said host vehicle, an angular velocity and a velocity of said host vehicle, a means for calculating lateral and longitudinal distance between said host vehicle and said preceding vehicle or said oncoming vehicle, a means for capturing a front stationary object, a means for obtaining movement of the preceding vehicle or position of the oncoming vehicle, and a means to estimate a lane position of said front stationary object from a relationship of the stationary object being captured and the preceding vehicle being obtained and a positional relationship with the oncoming vehicle. [A2280]

"System and technique for enhanced radar object detection"

A object detection system, such as a radar, and a method for improving the useful information provided thereby. The system is mounted on a vehicle for providing contact information to the vehicle operator. The method includes recording a baseline noise signal in a contact-free environment. When the system is later used in an operating environment, those returns which fall beyond the ranges of the baseline signal in any given direction, are excluded from the output of the object detection system. [A2281]

"Mine detector and inspection apparatus"

A mine detector is provided for detecting buried land mines safely and promptly. A sensor head (12) is connected to a detector body (1) through hinges (11-1 to 11-4) and arms (12-1 to 12-3) . The sensor head (12) includes a transmitting and receiving means for emitting electromagnetic impulses to the ground within a range of detection of land mines. When the transmitting and receiving means receives electromagnetic waves reflected from a land mine, information on the three-dimensional structure of the land mine buried under the ground is generated on the basis of the time of arrival of the reflected wave, the level of the reflected wave and the x and y coordinates of the transmitting and receiving means, and the information is displayed on a display (1) . The detector is also applicable to the inspection of steel rods and bars for concrete reinforcement. [A2282]

"Apparatus for determining the filling level of a product in a container"

An apparatus for determining the filling level of a product in a container with a transmission unit which generates high-frequency signals and emits them at a predetermined pulse repetition frequency in the direction of the surface of the filled product. The signals are reflected by the surface of the filled product and are received by a receiving unit. A delay circuit transforms the high-frequency signals/reflected signals into low-frequency signals in accordance with a predetermined translation factor and with an evaluation unit which determines the filling level of the product in the container on the basis of the delay time of the signals. The delay circuit includes: a transmission oscillator, a sampling oscillator, a digital sampling circuit, and a closed-loop/open-loop control unit. [A2283]

"System for detecting mobile receivers, using digital telebroadcasts transmissions of a ground transmitter network"

A system for detecting mobile bodies, using digital telebroadcasting transmissions of an array of terrestrial transmitters. The digital telebroadcast transmissions include a plurality of carriers, afforded symbol-based digital modulation, processed by carrier-wise orthogonal frequency multiplexing. After its reception stages, the receiver includes a processor for performing a discrimination of backscattering the transmissions, according to distance/Doppler bins. A reference pathway receives and demodulates the direct signal received from one of the transmitters. The processor includes a Doppler distribution, the Doppler pathways of which are each assigned to a respective frequency shift, then a distance compressor that yields samples arranged in the distance/Doppler bins. After coherent Doppler integration, a postprocessing with tracking contrasts the echoes obtained in these bins, to obtain radar plots containing position/velocity information on one or more objects. [A2284]

"Method and system for estimation of rainfall intensity in mountainous area"

Here are provided rainfall intensity output means adapted to output rainfall intensity R as a value equivalent to a linear function of altitude H: R (H) =aH+b, and processing means adapted to identify parameters a and b in the above estimate equation by regression analysis using a measurement value obtained by rainfall vertical distribution. This invention provides thereby method and system for estimation of rainfall distribution based on rainfall spatial distribution in mountainous area. [A2285]

"Path prediction system and method"

There is disclosed herein a method for detecting objects in a predicted path of a host vehicle moving on a highway lane. The method is for use in a system including a forward looking sensor, preferably a radar system, for providing range, angle and velocity data for objects within a field of view in front of the host vehicle, measuring systems for providing velocity and yaw rate data for the host vehicle, and a processing system responsive to the forward looking sensor and the measuring systems. The method includes the unordered steps of (a) calculating an estimated path of the host vehicle based on its velocity and yaw rate, (b) calculating estimated paths for each of the objects, (c) determining the lateral distance of each object from the predicted path of the host vehicle, and (d) classifying each object as either in or out of the highway lane of the host vehicle. The method includes processes for detecting lane changes by the host vehicle and for generating alternative path hypotheses in response to target deviations from the predicted paths. [A2286]

"Housing or part thereof for distance sensor"

A housing or housing part for a distance sensor, e.g., for motor vehicles, having at least one first housing part into which at least one member transparent to the sensor radiation for focusing the sensor radiation and/or at least one radome without intended focusing is/are integrated in the main radiation direction of the distance sensor. The housing or housing part has at least one second housing part into which at least one base plate having antenna elements is installed orthogonally to the main radiation direction of the distance sensor. A connecting line between the first housing part and the second housing part extends in a region between the base plate and the member transparent to the sensor radiation, and/or the radome. At least one plug connector is provided for electrical connection of the distance sensor to the motor vehicle. The connecting line is located in the region of the plug connector of the distance sensor, and is aligned co-axially to the main radiation direction of the distance sensor. [A2287]

"System and method for distance measurement by inphase and quadrature signals in a radio system"

A system and a method for distance measurement utilizes a radio system. The distance is measured by determining the time it takes a pulse train to travel from a first radio transceiver to a second radio transceiver and then from the second radio transceiver back to the first radio transceiver. The actual measurement is a two step process. In the first step, the distance is measured in coarse resolution, and in the second step, the distance is measured in fine resolution. A first pulse train is transmitted using a transmit time base from the first radio transceiver. The first pulse train is received at a second radio transceiver. The second radio transceiver synchronizes its time base with the first pulse train before transmitting a second pulse train back to the first radio transceiver, which then synchronizes a receive time base with the second pulse train. The time delay between the transmit time base and the receive time base can then be determined. The time delay indicates the total time of flight of the first and second pulse trains. The time delay comprises coarse and fine distance attributes. The coarse distance between the first and second radio transceivers is determined. The coarse distance represents the distance between the first and second radio transceivers in coarse resolution. An inphase (I) signal and a quadrature (Q) signal are produced from the time delay to determine the fine distance attribute. The fine distance indicates the distance between the first and second transceivers in fine resolution. The distance between the first and second radio transceivers is then determined from the coarse distance and the fine distance attributes. [A2288]

"Method for determining object location from side-looking sensor data"

An object location of a 3-D object to a side of a transportation vehicle is classified wherein the transportation vehicle moves along a front-to-rear directional axis and has a remote sensor mounted at a predetermined reference point. A set of detection points is identified substantially to the side of the transportation vehicle using the remote sensor. A detection point is found having a closest range to the vehicle reference point. The object is classified as on-center if a position Y.sub.near along the directional axis corresponding to the closest-range detection point is within a predetermined threshold distance from a position Y.sub.zero along the directional axis corresponding to the predetermined reference point. If not on-center, then the object is classified as spanning if a first position Y.sub.1 along the directional axis and a second position Y.sub.2 along the directional axis are on opposite sides of the position Y.sub.zero. If not spanning, then the object is classified as front if any particular detection point is forward of the position Y.sub.zero. If not spanning, then the object is classified as rear if any particular detection point is rearward of the position Y.sub.zero. [A2289]

"FM-CW radar processing device"

An FM-CW radar processing system pairs up peaks obtained by fast-Fourier transforming a beat signal occurring on an up portion and a down portion of a triangular-shaped FM-CW wave, calculates a distance or relative velocity with respect to a target object based on the peak signal in the up portion and the peak signal in the down portion obtained by the pairing, and compares the distance or relative velocity, obtained after changing the modulating signal for the FM-CW wave, with the distance or relative velocity obtained before changing the modulating signal. If the distance or relative velocity differs before and after changing the modulating signal, the pairing is judged to be mispairing. [A2290]

"Automotive radar system"

A motor-vehicle radar system provided with at least one housing includes at least one send/receive element for sending and/or receiving electromagnetic waves, at least one first dielectric member in the beam path of the electromagnetic waves, and at least one arrangement of electrical conductor tracks which are in direct contact with the first dielectric member. It is possible to supply an electric power to the electrical conductor tracks, the electrical conductor tracks preferably being used to heat the first dielectric member, and the electrical conductor tracks being made of a material having a pronounced, positive temperature coefficient (PTC characteristic) . [A2291]

"Apparatus for determining the filling level of a filling material in a container"

The invention relates to an apparatus for determining the filling level of a filling material in a container having a signal production unit which produces measurement signals, having at least one antenna which transmits the measurement signals in the direction of the surface of the filling material and which receives the measurement signals reflected on the surface of the filling material, and having a control/evaluation unit which uses the delay time of the measurement signals to determine the filling level of the filling material in the container. The apparatus allows a filling level measurement device, which operates on the delay-time principle, to be mounted on a container in a cost-effective and simple manner. An opening is provided in the upper region of one sidewall of the container, and in that the at least one antenna is positioned in this opening with the antenna being arranged and configured such that the measurement signals are emitted essentially in the direction of the surface of the filling material and such that the measurement signals reflected on the surface of the filling material are received by the at least one antenna. [A2292]

"Method for detecting stationary object located above road"

A method for detecting a target located above a road by using a camera and a radar system, wherein when it is determined that the target captured by the camera is the same target that has been captured by the radar, and when it is determined from an image captured by the camera that the target is at a height higher than road level, the method determines that the target is a stationary object located above the road. Further, when it is determined that the distance to the target captured by the camera or the radar is decreasing, and that the reception level from the target captured by the radar is also decreasing, the method determines that the target is a stationary object located above the road. [A2293]

"Near object detection system"

A near object detection (NOD) system includes a plurality of sensors, each of the sensors for providing detection coverage in a predetermined coverage zone. Each of the sensors includes a transmit antenna for transmitting a first RF signal, a receive antenna for receiving a second RF signal and a means for sharing the target data between each of the plurality of sensors in the NOD system. [A2294]

"Automated system and method for processing meteorological data"

A computer based method of processing meteorological data to automatically characterize significant meteorological events is disclosed. Meteorological data is received and processed to generate a plurality of distinct threat products for a given geographic area. The threat products are combined over the given geographic area to create a composite threat product, which is automatically compared to predetermined threshold values to identify one or more areas of threat. A system for processing meteorological data to automatically characterize significant meteorological events is also disclosed. [A2295]

"Method for determining accurately coordinates of a GPR antenna relative to a fixed reference"

A method and apparatus for determining accurately a coordinate of a transmitting/receiving antenna pair relative to a predetermined reference position. The method includes placing a transmitting antenna in proximity to a reflective strip, transmitting a first signal from the transmitting antenna and detecting a reflection of the first signal received from the reflective strip at the receiving antenna located at a fixed distance from the transmitting antenna. The method further comprises determining a coordinate of the antennas relative to the reflective strip based on a parameter of the reflection. The method may further comprise detecting a second signal received by the receiving antenna from a conductive strip located proximate to the reflective strip, and determining a second coordinate of the antennas based at least on a time difference between transmitting the first signal from the transmitting antenna and receiving the second signal at the receiving antenna. [A2296]

"Impulse radar antenna array and method"

An antenna array comprising a ground plane and a plurality of elements mounted thereon, said elements being capable of emitting and receiving ultra wideband emissions. Elements are arrayed on the ground plane in two parallel rows, a transmitting row, and a receiving row, such that a given element in the receiving row is aligned in at least one direction with a corresponding element in the transmitting row. Additionally, the elements are configured on the ground plane to elicit a symmetrical product response in the azimuthal plane, and to produce horizontally polarized signals. An alternative embodiment places the elements with unique inter-element spacing within the rows. An embodiment comprises a fence structure between rows. A method for use comprises the step of transmitting a signal via an element in the transmitting row and receiving said signal through an element in the receiving row, not aligned with the transmitting element. [A2297]

"Method and apparatus for detecting leaks in buried pipes by using a selected combination of geophysical instruments"

A method and apparatus for detecting and locating leaks in buried pipes is disclosed in which ground penetrating radar, induction, acoustic, and vacuum excavation systems are selected based on soil conditions and then employed in selected combinations. The conductivity and wave speed of the soil are used in the selection process and in the process of detecting and locating a leak based on the measurements obtained from the selected combination of detection systems. [A2298]

"System and method for measuring short distances"

A system and method are provided to measure relatively short distances between one or more moveable objects and with respect to an environment. The transponders may be affixed to other moveable objects and/or may be affixed in position within the environment. The transponders detect the query signal and respond with an acoustic response signal. A synchronized clock system establishes common timing between the transponders and the moveable objects such that the start time at which the acoustic response signal is sent is known. The moveable object detects a receipt time when the acoustic response signal is received. Knowing the start time and the receipt time, a transit time for the acoustic signal can be determined whereby a separation vector may be calculated. The system may be used to determine and transmit a table that contains the relative positions of all moveable objects in the environment. [A2299]

"Vehicle surroundings monitoring apparatus and vehicle traveling control system incorporating the apparatus"

A vehicle surroundings monitoring apparatus inputs images from a stereoscopic camera and signals of vehicle speeds, steering angle and yaw rate and detects front information such as solid object data, side wall data and lane marker data to estimate a traveling path of an own vehicle from the front information and traveling conditions of the own vehicle. Further, the apparatus establishes the position of lane markers on the traveling path of the own vehicle and determines the position of solid objects and side walls in terms of the traveling path of the own vehicle. Further, the apparatus extracts a preceding vehicle traveling ahead of the own vehicle and outputs information about the preceding vehicle to a traveling control unit for controlling a traveling of the own vehicle. [A2300]

"Method for distance measurement for vehicles by measuring transit time of laser pulses"

A method of distance measurement for vehicles by transit time measurement of laser pulses employs a distance sensor including a transmitter (11) having a pulse generator (1A) for the generation of a laser pulse (L) , and a receiver (12) having a transit time measurement circuit (3A) for the detection of a reflected laser pulse (RL) reflected by a target. A cover wall (2) , which is partially transparent to laser radiation, defines an installation space in which these elements are arranged, with a transit time of a reflected portion (RT) of the laser pulse (L) , reflected by the cover wall (2) to the receiver (12) , being measured as a reference time signal for the distance measurement. [A2301]

"Method and apparatus for identifying complex objects based on range readings from multiple sensors"

The invention is a method and apparatus for determining the shape and location of objects by trilateration based on the output of a plurality of range sensors. The range measurements from a plurality of sensors are correlated with each other to identify one or more potential objects. With respect to each potential object, it is assumed that the object can be one of a finite number of possible predefined shapes. for each potential object, a metric is calculated for each of the predefined shapes using the set of range measurements upon which the potential object is based defining the likelihood that the set of readings correspond to an actual object of that predefined shape. Each potential object is then assumed to have the predefined shape that yielded the lowest metric (i.e., that yielded the metric that indicates the highest likelihood that the object has the corresponding shape) . The list of potential objects is then ordered according by their calculated metrics from lowest to highest. The ordered list is then pared down to a smaller list of actual objects by selecting the potential object highest on the ordered list and assuming that it is an actual object and then removing from the list all other lower-ordered potential objects that are based on any of the individual measurements upon which the selected object is based and repeating this process until all potential objects on the list have either been selected as an actual object or removed from the list. [A2302]

"Ground penetrating radar"

A ground penetrating radar includes a signal generator, a return signal processor, a gate and an antenna. The signal generator is a dual frequency synthesizer that generates a stepped frequency master signal and a tracking signal offset by an intermediate frequency. The return signal processor is a dual channel quadrature receiver that mixes down a return signal and a sample of the master signal to intermediate frequency using the tracking signal. The signal generator is pulsed by the gate and the return signal is gated at the same frequency. Hollow pyramidal antennas are also described that have an ultrawide band bowtie structure with antenna electronics located within one antenna element. A method of operating the radar is also described. [A2303]

"Material level monitoring and reporting"

An material level monitoring and reporting system uses special micropower impulse radar level sensing probes, with one such probe being inserted into each of a plurality of material containment structures, such as storage tanks. The micropower impulse radar probes use flexible waveguides which extend downward to the tank bottom such that micropower radar impulses travel to and from the liquid surface via a wave guide, with the lapse between emission and reception of the impulse indicating a distance from the probe, and thus a liquid level. Each level sensing probe is connected to a communication link which collects level and status information from the level sensing probes and transmits it to a monitoring site. The material level data may be collected from a plurality of intermediate monitoring sites by a central monitoring sites. [A2304]

"Object recognizing apparatus for vehicle and the method thereof"

A stereoscopic optical system images a stereoscopic picture image, a stereoscopic image processing section calculates a three-dimensional distance distribution from the stereoscopic picture image, and an object recognizing section recognizes objects from the distance distribution information to calculate a relative position of the objects with respect to the vehicle. On the other hand, a travelling amount of the vehicle is detected by a steering sensor and a rear wheel rotation sensor. Then, an object positional information calculating section calculates a new relative position of the objects based on the relative position information memorized in a memory section and the calculated travelling amount of the vehicle and the memory section memorizes the new positional information. And, a bumping judgment outputting section judges the possibility of bumping against the objects based on the new relative position of the objects with reference to memorized information about the external shape of the vehicle. If it is judged therein that there is a possibility of bumping, the bumping judgment outputting section outputs a warning signal to an indicating section. [A2305]

"Radar data processing apparatus and data processing method"

The invention detects a ghost occurring due to mispairing, reflections from a wall, or the like, and improves the ability of a radar to track targets when actual relative velocity changes by more than a certain value. If a stationary target is present within a prescribed region centered about a moving target, the stationary target is excluded from output data by determining it as being a target resulting from mispairing due to the detection of guardrail posts or similar structures. Further, a moving target that is expected to collide with an eligible target is also excluded from the output data by determining it as being a target resulting from mispairing due to the detection of a target having many reflecting points. for a moving target showing an unlikely relative velocity, pairing with some other peak is attempted by determining the moving target as being a target resulting from mispairing due to the detection of a plurality of moving targets moving in the same direction. When there are two targets substantially equal in distance and velocity, the target located outward, as viewed from the radar-equipped vehicle, is excluded from the output data by determining it as being a ghost occurring due to reflections from a wall or like structure. After checking continuity, if the present data is not one calculated by extrapolation but the previous data is one calculated by extrapolation, filtering calculations are not performed for the calculation of the relative velocity, in other cases, the filtering calculations are performed. [A2306]

"System and method for locating radio frequency identification tags"

A system and method for determining the position of a radio frequency identification (RFID) transponder with respect to a sensor. In one embodiment, the system comprises a plurality of stationary sensors located in an array within certain physical areas. Each sensor comprises a plurality of antenna coils arranged in unique physical orientations and capable of transmitting radio frequency signals of differing phase. The RFID transponder includes an antenna which receives the plurality of signals generated by the antenna coils, and compares the phase of at least two of the signals to determine the relative position of the transponder. In a second aspect of the invention, the aforementioned antenna coils emit two direction finding mode (DFM) signals in succession, the first signal with all antenna coils turned on, the second with one of the coils turned off. The spatial relationship of the transponder antenna and individual antenna coils precludes all of the signals in each sensor from being rejected by the transponder during emission of both the first and second DFM signal. Hence, the transponder is kept in constant communication with the sensor in all orientations. In another embodiment, the location of the transponder with respect to two or more sensor (s) is determined through measurement of the intensity of the signals received by the antenna coil of the transponder. The invention also includes a system and method for transmitting data between a sensor and a dormant (motionless) RFID transponder using a hand-held high intensity RF probe. [A2307]

"Automotive lane changing aid indicator"

There is disclosed a vehicle equipped with two multibeam electronically scanned radar systems that function as side object detection systems. The transmit/receive modules of the radar are illustratively located on right and left side panels of the vehicle at the rear of its body. Each radar system generates eight equal-angle beams. The radar systems are programmed so that targets are detected only within a predefined range for each of its eight beam patterns corresponding to the adjacent highway lane. As an overtaking vehicle approaches in an adjacent lane, its approach is detected sequentially by the beams on that side of the vehicle. Each radar system generates eight signals, corresponding to the eight beams positions, which are coupled individually to eight LEDs configured in an array. Detection of an overtaking vehicle within a scanned beam causes illumination of a corresponding LED. Thus, the driver of a host vehicle can easily determine the presence and position of an overtaking vehicle in an adjacent lane relative to his or her own from the position of the illuminated LED or LEDs in the array, and can also determine the closing speed of the overtaking vehicle from the rapidity of the transition of LEDs in the array being illuminated. In a preferred embodiment, the arrays are affixed to the outside mirrors in a vertical columnar configuration. [A2308]

"All weather precision guidance of distributed projectiles"

A system and method (32) for measuring line-of-sight angular rates for all-weather precision guidance of distributed projectiles (16) and a guidance system (10) based thereon. In accordance with the novel method (32) for measuring line-of-sight angular rates, first the range rates of the target (14) relative to at least two projectiles (16) is determined, as well as the position and velocity of each projectile (16) . Then, the line-of-sight angular rate of the target (14) relative to at least one projectile (16) is computed from the range rates, positions, and velocities. In the illustrative embodiment, the range rate of the target (14) relative to a projectile (16) is determined based on a monostatic target Doppler measurement, a monostatic projectile Doppler measurement, a bistatic Doppler measurement of the target (14) by the projectile (16) , and the carrier frequency of a data link (26) between the projectile and the shipboard system. The guidance system (10) of the present invention includes a monostatic radar (18) illuminating the target (14) , bistatic receivers (44) aboard at least two projectiles (16) fired at the target (14) , and a system (32) for determining line-of-sight angular rates to the target based on the monostatic measurements and the bistatic measurements from at least two projectiles. The guidance system (10) further includes a system (34) for computing guidance command signals for at least one projectile based on the line-of-sight angular rates, and a projectile steering unit (52) aboard at least one projectile for steering the projectile based on the guidance command signals. [A2309]

"Apparatus for the display of weather and terrain information on a single display"

A display system having a display screen for graphical display of data, a graphics processor for receiving data from at least a terrain data base and data from a weather radar and for converting the received data into a single data stream to provide an input data stream to the display screen. The single display displays the weather data on one portion of the display screen and displays the terrain data on a second portion of the display screen. The weather data is displayed as a two-dimensional graphic and the terrain data is displayed as a three-dimensional graphic, thus providing a user with the necessary flight information while keeping processing resources to a reasonable level. The terrain data is displayed as an out the window display graphic, and the weather data and the terrain data displays are scaled such that the displays are dimensionally juxtaposed to allow rapid recognition of the data by a user of the display system. [A2310]

"Electronic vehicle toll collection system and method"

A system for automatic collection of tolls includes an in-vehicle toll processor having memory for storing a toll-money-available quantity purchased by the user, and a toll-facility-identification site that transmits a toll-facility-identifier signal indicating the identity of the upcoming toll facility. As the vehicle approaches the identification site, the in-vehicle processor receives the identifier signal and calculates the toll to be debited. When the vehicle passes through the toll facility, the in-vehicle processor transmits its identity, its net balance and the toll, which it debits from an account balance. The in-vehicle processor may increment a low balance, in which case it transmits information which is relayed to a central system for billing. Various means for shutting down delinquent in-vehicle components or identifying offender vehicles are described. [A2311]

"Method for evaluating objects in the path of a vehicle"

A method for evaluating objects in the path of a vehicle, in which a sensor is used to detect the distance (d.sub.zo, d.sub.zi) and/or the speed of the target objects (Zo, Zi) . In the presence of more than one target object (Zo, Zi) , only the target object (Zi) that is in an area limited by at least one parameter defined by the position relative to the vehicle (F) , is included in the evaluation as a new target object (Zo) , instead of the current one. The following parameters can be included as conditions for selecting a new target object: d.sub.zi.ltoreq.MAX (d.sub.min, d.sub.zo +d.sub.0, .alpha.*d.sub.zo) . [A2312]

"Medium frequency pseudo noise geological radar"

System and methods are disclosed for transmitting and receiving electromagnetic pulses through a geological formation. A preferably programmable transmitter having an all-digital portion in a preferred embodiment may be operated at frequencies below 1 MHz without loss of target resolution by transmitting and over sampling received long PN codes. A gated and stored portion of the received signal may be correlated with the PN code to determine distances of interfaces within the geological formation, such as the distance of a water interfaces from a wellbore. The received signal is oversampled preferably at rates such as five to fifty times as high as a carrier frequency. In one method of the invention, an oil well with multiple production zones may be kept in production by detecting an approaching water front in one of the production zones and shutting down that particular production zone thereby permitting the remaining production zones to continue operating. [A2313]

"Multi-purpose sensor and data link"

Modulating digital data onto a carrier frequency and then amplitude modulating the result with a waveform of a different frequency permits measuring position and velocity of an elevator cab while transmitting digital data to the cab. [A2314]

"Method for determining a time to impact in a danger zone for a vehicle having a pre-crash sensing system"

A pre-crash sensing system (10) for a source vehicle (50) having a source vehicle length and a source vehicle width that is coupled to a countermeasure system (30) is described. The system includes an object sensor (17) generating object distance signal, object relative velocity signal and an object classification signal. A controller (12) is coupled to the object sensor (17) . The controller determines a danger zone (52) based on the source vehicle length, source vehicle width, object length and object width. The controller determines a source vehicle time interval corresponding to the time the source vehicle is within the danger zone. Controller (12) determines an object time interval corresponding to the time the object is within the danger zone and when the source vehicle time interval corresponds with the target vehicle time interval. The controller activates the countermeasure system (30) when the source vehicle time interval coincides with the target vehicle time interval. [A2315]

"Method for classifying an impact in a pre-crash sensing system in a vehicle having a countermeasure system"

A pre-crash sensing system (10) for a source vehicle (50) having a source vehicle length and a source vehicle width that is coupled to a countermeasure system (30) is described. The system includes an object sensor (17) generating an object distance signal, object relative velocity signal and an object classification signal. A controller (12) is coupled to the object sensor (17) . The controller determines a danger zone based on the source vehicle length, source vehicle width and object length and object width. The source vehicle time interval is determined by the controller (12) corresponding to the time the source vehicle is within the danger zone. The controller (12) determines the object time interval corresponding to the time the object is within the danger zone. The controller (12) determines a point of impact in response to the object time interval and the source vehicle time interval. The controller (12) activates the countermeasure in response to the point of impact. [A2316]

"Distance measuring device for a vehicle"

In a distance measuring device, reflected pulsed light beams with respect to one transmitted light beam are amplified by plural amplifiers (22a, 22b) of different gains. The retroreflection times of the reflected pulsed light beams are detected by retroreflection time detectors (30a, 30b) respectively connected to the amplifiers. Based on outputs of the retroreflection time detectors, distance calculator (40) judges the overlapping state of the reflected pulses and the power of reflection from first pulse widths of the reflected pulsed light beams, selects a distance calculating method in accordance with the state, and outputs distance measurement data of high reliability. [A2317]

"Measurement system and method"

System and methods are disclosed for fluid measurements which may be utilized to determine mass flow rates such as instantaneous mass flow of a fluid stream. In a preferred embodiment, the present invention may be utilized to compare an input mass flow to an output mass flow of a drilling fluid circulation stream. In one embodiment, a fluid flow rate is determined by utilizing a microwave detector in combination with an acoustic sensor. The acoustic signal is utilized to eliminate 2.pi. phase ambiguities in a reflected microwave signal. In another embodiment, a fluid flow rate may be determined by detecting a phase shift of an acoustic signal across two different predetermined transmission paths. A fluid density may be determined by detecting a calibrated phase shift of an acoustic signal through the fluid. In another embodiment, a second acoustic signal may be transmitted through the fluid to define a particular 2.pi. phase range which defines the phase shift. The present invention may comprise multiple transmitters/receivers operating at different frequencies to measure instantaneous fuel levels of cryogenic fuels within containers positioned in zero or near zero gravity environments. In one embodiment, a moveable flexible collar of transmitter/receivers may be utilized to determine inhomogenuities within solid rocket fuel tubes. [A2318]

"Method and apparatus for non-coherent navigation using low frame rate telemetry"

A method and apparatus for obtaining measurements, on a spacecraft that employs a transceiver, at intervals that are shorter than the telemetry frame duration for use in correcting ground-based Doppler measurements so as to remove the effects of drift in the spacecraft oscillator frequency reference. Samples of navigation counters on the spacecraft that supply information that may be used to compare the uplink frequency with the downlink frequency at the spacecraft are triggered at intervals that are shorter than the duration of a telemetry frame, the samples are then included in a telemetry frame and are time tagged after they are received on the ground, the time tagged samples are then used to calculate precise two-way Doppler measurements. [A2319]

"Image processing for hazard recognition in on-board weather radar"

A method of providing weather radar images to a user includes obtaining radar image data corresponding to a weather radar image to be displayed. The radar image data is image processed to identify a feature of the weather radar image which is potentially indicative of a hazardous weather condition. The weather radar image is displayed to the user along with a notification of the existence of the feature which is potentially indicative of the hazardous weather condition. Notification can take the form of textual information regarding the feature, including feature type and proximity information. Notification can also take the form of visually highlighting the feature, for example by forming a visual border around the feature. Other forms of notification can also be used. [A2320]

"Radar imaging system and method"

An imaging system and method. The invention provides an intra-pulse repetition interval (PRI) agile beam technique for enhanced resolution that can be used at aspect angles near the velocity vector of a host vehicle. It is particularly useful at small scan angles where beam sharpening array times become large. At these scan angles, the bandwidth of the clutter is narrower than at higher scan angles and allows large PRIs without degradation from Doppler ambiguities. In accordance with the present teachings, sequential illumination is performed within a PRI to multiple beam locations using an agile beam. The interleaving of beams reduces map formation times compared to conventional techniques using sequential arrays. The inventive system is adapted for use with an electronically scanned (e.g., synthetic aperture array radar) antenna. The inventive method includes the steps of activating the antenna to generate a beam of electromagnetic energy, causing the beam to scan over a predetermined scan volume consisting of a predetermined range of scan angles relative to a reference vector, and generating multiple simultaneous beams of electromagnetic energy over a subset of the predetermined range of scan angles. [A2321]

"Method and apparatus for recognizing object"

A transmission wave is applied to a predetermined range in a width-wise direction of a subject vehicle. Objects located ahead of the subject vehicle are recognized on the basis of reflected waves which result from reflections of the transmission wave. The reflected waves are converted into a received signal. Detection is made regarding a variation in an intensity of the received signal along a direction corresponding to the width-wise direction of the subject vehicle. The received signal is separated into a first signal portion and a second signal portion on the basis of the detected signal intensity variation. The first signal portion corresponds to a scattered portion of the transmission wave. The second signal portion corresponds to an unscattered portion of the transmission wave. Objects are recognized on the basis of the second signal portion. [A2322]

"Antenna scanner"

A wave guide scanner assembly having an oscillating support for a scanning antenna which is driven by an assembly having no contacting components. The scanner assembly is particularly useful for motor vehicular collision warning systems. The drive assembly for the oscillating support includes a coil and magnet for driving the support when current is applied thereby resulting in translational movement of the magnet and oscillating movement of the support. A spring flexure assembly is connected to the support for providing controlled harmonic oscillation to the support and antenna. [A2323]

"Direct PWM reflectometer"

A time-domain reflectometer (TDR) forms a pulse width modulated (PWM) signal directly on a transmission line, where the PWM width is proportional to range to a discontinuity on the transmission line. Two PWM detection methods can be used: (1) realtime, wherein the PWM signal is detected in realtime, and (2) expanded-time, wherein the PWM signal is time-expanded before detection for higher accuracy. Both methods convert the analog transmission-line PWM signal to a digital output PWM signal of identical duty-cycle for averaging, counting, or other processing to indicate range. In a preferred mode, a transmission line is sampled at a floating offset frequency relative to the transmission-line PWM frequency to form a PWM output having a floating time-expansion factor but a precise duty-cycle related to the location of the discontinuity. The essence of this TDR is low cost, precision and absolute simplicity. Applications include precision tank level sensing. [A2324]

"Switched beam antenna architecture"

A multiple beam array antenna system comprises a plurality of radiating elements provided from stripline-fed open-ended waveguide coupled to a Butler matrix beam forming network. The Butler matrix beam forming network is coupled to a switched beam combining circuit. The antenna can be fabricated as a single Low Temperature Co-fired Ceramic (LTCC) circuit. [A2325]

"Method and apparatus for correcting a curve radius"

The present invention relates to traveling control for a vehicle and, in particular, to a method and apparatus, in an adaptive cruise control (ACC) system for a vehicle, for correcting the curve radius of the lane on which the vehicle is traveling, wherein the curve radius is corrected accurately and speedily based on the information about the movement of a leading vehicle detected with a radar, etc. The apparatus, in the ACC system, for correcting the curve radius comprises a means of computing a virtual curve radius based on the information about the horizontal movement of the leading vehicle, a means of computing the horizontal relative position for the curve radius obtained by the ACC system and the horizontal relative position for the virtual curve radius, and a means for correcting the curve radius based on the value obtained by synthesizing the computed horizontal relative positions. [A2326]

"Methods and apparatus to determine a target location in body coordinates"

A method for determining a position of a doppler radar target in aircraft body coordinates is described. The method includes calculating values for doppler circle equations, in doppler coordinates, based upon a range to the target, a vehicle velocity, and a center frequency and bandwidth of a doppler swath filter. Further, an interferometric circle in body coordinates is calculated based upon a range to the target, and an interferometric angle. The doppler circle equations are transformed into body coordinates utilizing received pitch, roll and yaw information. Finally, an intersection of the interferometric circle equations with the transformed doppler circle equations is calculated, the intersection being the position of the target in body coordinates. [A2327]

"Sensor front-end for vehicle closing velocity sensor"

A sensor front end is disclosed that is able to discriminate objects based on their range from the sensor. The sensor includes an antenna that transmits a sensor signal and, if an object is present receives a reflected signal therefrom. A pulsed oscillator provides a pulsed first signal having a first frequency and phase, and wherein the pulsed oscillator provides the pulsed first signal for a predetermined pulse duration and with a predetermined pulse repetition frequency. The pulsed oscillator provides the pulsed first signal to a first input port of a dual mode mixer that is further coupled to the antenna via a second port. The dual mode mixer transmits a portion of the pulsed first signal from the first input port to the second port and thus to the antenna to be transmitted as the sensor signal. In addition, the dual mode mixer uses a portion of the first signal to mix with the received reflected signal. The dual mode mixer then provides a mixed signal as an output at a third port. Thus, the pulsed first signal provides both the signal to be transmitted as the sensor signal and the local oscillator signal for the mixer as well. The dual mode mixer will only provide a mixed signal output if the received reflected signal is present in the dual mode mixer concurrently with the pulsed first signal. Accordingly, an object can only be detected when the range to the object is such that the signal propagation time to and from the object is less than or equal to the predetermined pulse length of the pulsed first signal. [A2328]

"Transmission system and coding communication method for a transmission system"

The conventional combination cannot realize an efficient road traffic system as a whole. A transmission system has a plurality of modules installed at different positions along a predetermined road. Each of the plurality of the modules includes a receiving section for receiving an input signal and a transmission section for transmitting an output signal on the basis of the input signal according to a predetermined radio scheme. Each of the plurality of the modules receives and transmits a signal, whereby the whole or part of the information contained in the signal is transmitted along the whole or part of the predetermined road. This transmission system can construct an efficient integrated road traffic system as a whole. [A2329]

"System and method for detection and tracking of targets"

System and method for detection and tracking of targets, which in a preferred embodiment is based on the use of fractional Fourier transformation of time-domain signals to compute projections of the auto and cross ambiguity functions along arbitrary line segments. The efficient computational algorithms of the preferred embodiment are used to detect the position and estimate the velocity of signals, such as those encountered by active or passive sensor systems. Various applications of the proposed algorithm in the analysis of time-frequency domain signals are also disclosed. [A2330]

"Method for adjusting a vehicle-mounted radar sensor"

In a method for adjusting a vehicle-mounted radar sensor having three radar lobes, which are emitted in a fan-shaped manner, one of which is a central lobe, and the other two are lateral lobes extending at the same angle, a reflector plate disposed at a distance from the vehicle and perpendicular to the vehicle longitudinal axis is pivoted about a vertical axis. The deviation of the reflector's position angle from an ideal position is determined. The ideal position is one in which the two lateral radar lobes produce at least a substantially identical reflection signal. The radar sensor is subsequently pivoted by a correction angle, which is equal to the deviation of the reflector plate's position angle, but in the opposite direction. [A2331]

"Method for measuring the distance and speed of objects"

A method for measuring the distance and speed of objects using electromagnetic waves with a motor vehicle radar system is described, electromagnetic waves being transmitted and simultaneously received, the transmitted electromagnetic waves being modulated in the shape of a ramp, at least the signals received during one rise and one drop of the frequency of the transmitted signal being mixed in each case with the transmitted signal, a number of intermediate frequency signals being formed, and the distance and speed of the object being calculated using the intermediate frequency, a weather condition in the vicinity of the motor vehicle and/or a disturbance in the motor vehicle radar system being identified on the basis of characteristic intermediate frequency signals. [A2332]

"Self-modulating remote moving target detector"

A self-modulating, remote, moving target detector for intrusion alarms, vehicle detection, and remote speed and distance measurement that includes a remote continuous wave radar transceiver that is used to detect moving targets. The same frequency used for the radar transmission is modulated in a continuous manner in order to transmit radar data concerning a moving target to a remote location away from the radar transceiver. The transceiver oscillator is self-modulated by the reflected signal received from a moving target in the transceiver and retransmitted such that the primary radar signal becomes the information carrier concerning the moving target, which is received remotely, in order to activate an alarm or a display system showing the moving target. The system could be utilized with any frequency from audio to light, with RF and microwave of primary interest. [A2333]

"Radar plow drillstring steering"

A radar-plow drillstring steering system comprises a steering plow and a measurements-while-drilling instrument for mounting just behind the drill bit and downhole motor of a drill rod. The instrument includes a radar system connected to upward-looking and downward-looking horn antennas and a dielectric-constant sensor. The steering plow includes four pressure pads radially distributed around the outside surface and their associated servo motors. A coordinated control of the pressure pads allows the steering plow to push the drillstring and drill bit up-down-left-right. The antennas and sensor are embedded in respective ones of the pressure pads and are used to electronically and non-invasively probe a coal seam to locate its upper and lower boundary layers. The dielectric-constant sensor provides corrective data for the up and down distance measurements. Such measurements and data are radio communicated to the surface for tomographic processing and user display. The radio communication uses the drillstring as a transmission line and F1/F2 repeaters can be placed along very long runs to maintain good instrument-to-surface communication. A docking mechanism associated with the instrument and its antenna array allows the instrument to be retrieved back inside the drillstring with a tether should the drill head become hopelessly jammed or locked into the earth. [A2334]

"Frequency hopping spread spectrum passive acoustic wave identification device"

A system and method for interrogating a passive acoustic transponder, producing a transponder signal having characteristic set of signal perturbations in response to an interrogation signal, comprising a signal generator, producing an interrogation signal having a plurality of differing frequencies, a receiver, for receiving the transponder signal, a mixer, for mixing the transponder signal with a signal corresponding to the interrogation signal, to produce a mixed output, an integrator, integrating the mixed output to define an integrated phase-amplitude response of the received transponder signal, and an analyzer, receiving a plurality of integrated phase-amplitude responses corresponding to the plurality of differing frequencies, for determining the characteristic set of signal perturbations of the passive acoustic transponder. [A2335]

"Vehicle surroundings monitoring apparatus"

A laser radar irradiates electromagnetic waves around a subject vehicle, detects the electromagnetic waves reflected from objects lying around the subject vehicle, and outputs a plurality of directions of scanning irradiation and detected distances from the subject vehicle to the objects in the respective directions. A recognition unit detects a relative position and relative speed of each objects lying around the subject vehicle. The recognition unit stores whether or not detection points data exists in each of M.times.N small regions into which X, Y coordinates are divided into a two dimensional array including a plurality of elements corresponding to the small regions. The recognition unit performs arithmetic operations of multiplication and summation of the respective elements of the two dimensional array while sequentially scanning a mask of a two dimensional array comprising J.times.K (J< N, K< M) elements, and determines attributes such as positions, sizes, etc. of the objects. [A2336]

"Method for acquiring vehicle driving information and a system thereof"

In order to enhance reliability of a determination regarding whether a preceding vehicle is running in the same lane as a following vehicle when only one of the preceding vehicle and the following vehicle is in a curved region of a road, a distance and an apart-angle of the preceding vehicle, and an amplitude of a reflective wave are detected, and it is determined, on the basis of the detected apart-angle and amplitude of the reflective wave, whether the preceding vehicle is in the same lane as the following vehicle. [A2337]

"Process for carrying out a non-contact remote interrogation"

The invention relates to a system suitable for a remote interrogation of passive transponders using chirp signals for interrogation. The transponder preferably has an encoding unit (11) , a calibrating unit (12) and a measuring unit (13) each with a plurality of parallel channels (11.1 to 11.5, 12.1 and 13.1 to 13.2) . The encoding unit and the calibrating unit are preferably jointly incorporated with a common delay line (14) on the same SAW chip. The interrogation signals received in the transponder via an antenna (10) are delayed characteristically and code-specifically, in particular in the encoding and calibrating unit. Decoding in the interrogation station is preformed by discrete Fourier transformation of the response signal and subsequent evaluation of the spectrum. To correct general disturbing influences on the delay of the response signal, said signal is calibrated using a single calibrating component in the response signal. Calibration occurs by appropriate shift of the spectrum of the stored response signal. for partial correction of individual disturbing influences on the delay of the response signal components, the calibrated response signal undergoes additional correction. If further measuring response signals similar to the identifying and calibrating response signals are produced then they can, for example, be used to measure temperature by appropriate evaluation of the digitally stored response signal. The preferred combination of measuring and encoding unit enables each transponder to be calibrated individually, and consequently, for example, measurement of the absolute temperature. [A2338]

"Method and apparatus for recognizing preceding vehicle with determination of curved traffic lane"

In a method for recognizing a preceding vehicle traveling on a traffic lane on which a subject vehicle is traveling, it is determined whether or not the preceding vehicle is deviated from a preceding vehicle recognizing region ahead of the subject vehicle. Then, when the preceding vehicle is deviated from the preceding vehicle recognizing region, it is determined whether or not the traffic lane is curved while maintaining recognition of the preceding vehicle. When the traffic lane is curved, it is determined whether or not the preceding vehicle has entered the preceding vehicle recognizing region for a predetermined time period while maintaining the recognition of the preceding vehicle. As a result, the recognition of the preceding vehicle is maintained or released in accordance with whether or not the preceding vehicle has entered the preceding vehicle recognizing region for the predetermined time period. [A2339]

"Method and apparatus for determining a target vehicle position from a source vehicle using a radar"

A sensing system (10) for an automotive vehicle includes a first radar sensor (18) generating a first and a second range signal, and a second radar sensor (20) generating a first and a second range signal corresponding to two sampling time periods. A controller (12) is coupled to the first radar sensor (18) and the second radar sensor (20) . The controller (12) calculates a first position and a second position from the first radar sensor and the second radar sensor range measurements. The controller (12) generates a first set of points corresponding to the first position and a second set of points corresponding to the second position. The controller (12) calculates a plurality of calculated range-rate values in response to the first set of points and the second set of points. The controller (12) compares the plurality of calculated range-rate values to the measured range-rate and selects the closest range-rate from the plurality of calculated range-rate values. A couple of target position points is generated from the first set of points and the second set of points corresponding to the calculated closest range-rate. [A2340]

"Vehicle-mounted radio wave radar"

An antenna base, a control circuit section, and a high-frequency circuit section are enclosed in an inner space defined by a housing and a radome. Inside this inner space, the control circuit section and the high-frequency circuit section are surrounded by the antenna base and the housing. A circuit GND common to the control circuit section and the high-frequency circuit section is electrically connected to the antenna base and the housing, and it is connected to a body GND through only capacitive impedance. [A2341]

"System and method for avoiding accidents in intersections"

A method for a subject vehicle to avoid collisions is provided. At least one lane feeding into an intersection is scanned. The presence of a threat vehicle in the at least one lane is detected. Whether the subject vehicle and the threat vehicle will occupy the intersection at the same time is predicted. A warning is issued in response to the predicting. [A2342]

"Method for preventing the collision of a vehicle with an obstacle located in front of the vehicle and braking device"

In a method for preventing a collision of a vehicle with an obstacle located on its front (such as preferably another vehicle traveling in front of the vehicle) , the headway between the vehicle and the obstacle and the difference in speeds of the vehicle and of the obstacle (relative speed) and also the speed and acceleration/deceleration of the vehicle are detected and a collision message and/or a braking operation is triggered as a function thereof. The driver's activity, the state of the road, the loading state and the degree of overlap of the vehicle relative to the obstacle are detected, and from this information, a first headway (D_brake) between the vehicle and the obstacle is calculated, which is the least necessary to avoid a collision of a vehicle with the obstacle by steering the vehicle past the obstacle. In addition, a second headway (D_steer) is calculated, which is the least necessary to avoid a collision by steering the vehicle past the obstacle. Automatic braking is initiated only when the detected headway is smaller than both the first and second calculated headway values, and when the degree of overlap [A2343]

"Airbag inflation control system and method"

Airbag inflation control system and method for a vehicle including an airbag module having a housing mounted in combination with the seat back and an inflatable airbag arranged therein. An anticipatory sensor detects that an impact requiring deployment of the airbag is required based on data obtained prior to the crash and initiates inflation of the airbag in the event an impact requiring deployment of the airbag is detected prior to the start of the impact. An inflator responds to the detection by the anticipatory sensor that an impact requiring deployment of the airbag is required and inflates the airbag. The occupant may be displaced upon inflation of the airbag. [A2344]

"Adaptive cruise control system"

An adaptive cruise control system that provides a smooth following by limiting the headway to keep it lower than a predetermined maximum. The present invention accomplishes this objective through systematically limiting the headway. In particular, the present invention reduces a time related speed multiplier used in calculating the desired headway, to maintain a headway that is less than an effective maximum sensor range for the adaptive cruise control system. [A2345]

"Passive RFID transponder/reader system and method for hidden obstacle detection and avoidance"

A system designed to detect and identify fixed utility objects, such as telephone pedestals, power transformers, man-holes, anchor cables, and the like, that are hidden by heavy overgrowth of vegetation. The system provides for automatic look-ahead detection of such objects during mowing and clearing operations with heavy machinery using passive radio frequency transponder technology to both detect the immediate presence of a tagged object as well as basic identification of the type of object replying to the interrogation. The operator can be signaled audibly and/or visually when a tagged object is detected. The transmitter and antennae are mounted in the cab of a mobile machine for protection from physical damage. An integrated microprocessor performs the requisite algorithms needed to process the reply form one or more RFID (Radio Frequency Identification) tags and generate the alert signals for the operator alerts. Once the object has been located it can be marked and cleared safely by hand thereby preventing severe damage to the tagged equipment. Handheld RIFD programmers are used to load or record important identification and maintenance data in the attached tag for maintenance tracking, latitude-longitude location, asset management, placement of other related underground devices or cables, etc. The transmitter unit and display devices can be powered directly from the machine's system power. [A2346]

"System for item and orientation identification"

A system includes an identification circuit, a grid antenna, a receiver, and a processor. The identification circuit includes resonant circuits formed on a substrate within a perimeter. Identification may be based on a quantity or physical arrangement of detected resonant circuits within the perimeter. One resonant circuit provides a reference signal. Any resonant circuit may be tuned in accordance with the reference signal by the addition or subtraction of reactance formed on the substrate. A capacitance of a first group of capacitors located outside a turn of an inductor is roughly equal to a capacitance of a second group of capacitors located inside the turn. Any resonant circuit may also be tuned by affixing a resonance modifying element, for example a sticker, to the identification circuit. The grid antenna provides antenna field patterns, one for each cell location. The receiver communicates with the identification circuit via the grid antenna. The processor controls the receiver according to a method including: (a) detecting a first signal at a first grid location, (b) determining an offset as a difference between a frequency of the first signal and a predetermined frequency, (c) detecting a second signal at a second grid location, (d) determining an identification in accordance with the first and second locations, the second signal, the offset determined in step (b) , and any offset accomplished by a sticker, and (e) determining an orientation in accordance with the first and second grid locations. [A2347]

"System for locating golf balls"

The present invention provides a system for locating lost golf balls which includes a golf ball that incorporates an array of passive transponders and a radio frequency ("RF") transmitter/receiver capable of energizing the passive transponder array and of detecting a signal emitted by the array. Each passive transponder functions as a tuned LC circuit that is charged by the RF transponder/receiver and emits an RF signal, detectable by the RF transmitter/receiver, for a finite period of time after the RF transmitter/receiver is turned off. [A2348]

"HF radar"

A HF radar uses the same antenna array (414, 424, 424', 424') for both transmission (TX) and reception (RX) . Each radiating element of the array may be driven by its own local transmitter and may have its own local receiver, both being connected to a central processor via fiber optic cables conveying digital data to the local transmitter relating to element energization in the TX mode and data representing signals received by the radiating elements in the RX mode. Each antenna element may have its own TX/RX unit, or a single TX/RX unit may serve two or more radiating elements. Each radiating element may comprise a skeletal pyramidal dipole mounted at ground level. [A2349]

"Operational bright-band snow level detection using doppler radar"

A method to detect the bright-band snow level from radar reflectivity and Doppler vertical velocity data collection with an atmospheric profiling Doppler radar. The measurement may be made available to the public through the Internet. [A2350]

"Collision detection system and method of estimating miss distance employing curve fitting"

A collision detection system and method of estimating a miss distance of an object are provided. The collision detection system includes a sensor for sensing an object within a field of view and measuring range and range rate of the sensed object. The collision detection system further includes a controller for computing a mathematical square of the range and computing a mathematical square of the product of range and range rate. The controller estimates a miss distance of the object as a function of the computed squared range and the squared product of range and range rate. [A2351]

"Vehicle reversing sensor device"

A vehicle reversing sensor device includes a power plug for obtaining power from a vehicle, a control box connected to the power plug and having a control circuit provided therein, and at least one vehicle reversing sensor electrically connected with the control circuit. The vehicle reversing sensor is mounted on a reverse light of the vehicle to detect whether there is light emitted from the reverse light or not. When the vehicle reversing sensor detects there is light emitted from the reverse light, the reversing sensor outputs detecting signals, otherwise, the reversing sensor is not activated. [A2352]

"Collision avoidance method and system"

A presence detection system includes a reader device attached to a first body, and a tag device attached to a second body. The reader device has an ultrasonic transducer for generating and transmitting ultrasonic pulses at a first rate of occurrence, an RF receiver for receiving a RF signal, and a microcontroller coupled to the ultrasonic transducer and the RF receiver for receiving signals from the ultrasonic transducer and the RF receiver and for controlling the operation of ultrasonic transducer and the RF receiver. The tag device has an ultrasonic receiver for receiving ultrasonic pulses from the ultrasonic transducer of the reader device, and an RF pulse generator for generating and transmitting an RF pulse. The microcontroller instructs the ultrasonic transducer to generate and transmit the ultrasonic pulses, the ultrasonic receiver of the tag device receives at least one of the ultrasonic pulses, the ultrasonic receiver triggers the RF signal generator to transmit an RF pulse, the RF receiver of the reader device receives the RF signal, and the microcontroller detects the presence of the tag device based on the reception of the RF pulse. The distance between the reader device and the tag device is determined based on the amount of time between the transmission of the ultrasound pulse by the reader device and the reception of the response RF pulse by the reader device. [A2353]

"Location data dissemination and reception for entities having short-range receivers"

In order to reduce power consumption of battery-powered devices to which location data is to be dissemination by short range communication, the devices are arranged to wake-up to listen for location data at known times as judged against a reference time standard. This time standard is also available to the transmitters of location data which accordingly transmit their location data at the known times. [A2354]

"Vehicle-onboard signal processing device and vehicle-onboard radar system"

In order to magnetically shield the transmission line which connects the external connector mounted on the outer housing with the internal circuit and also to make it possible to freely mount the external connector without being limited by the position of the internal circuit, an outer housing 60 consists of an outer housing main body 61 and a shielding layer 62 applied to the inner-periphery surface of the outer housing 60. An transmission line 73 extends from the internal circuit through the outer-periphery side of the shielding layer 62 of the outer housing 60 along the shielding layer 62 to the desired position, where the external connector 70 is placed. [A2355]

"Proximity measuring apparatus"

A proximity measuring apparatus (70) comprises an interrogator (80) for generating an interrogation signal encoded with a reference signature code comprising concatenated codes and emitting it as interrogating radiation. It also incorporates a transponder (90) for receiving the interrogating radiation, demodulating it to extract its signature code and then remodulating it after a delay period to provide a signal for reemission as return radiation therefrom. The interrogator (80) receives return radiation at its antenna (260) and demodulates it to extract its signature code and then correlates the code with the reference code to determine mutual correlation thereof. The interrogator (80) incorporates a computer (290) for controlling a scan direction of the antenna (260) and for measuring time delay between emission of the interrogating radiation therefrom and receipt of corresponding return radiation. The computer (290) computes distance and relative bearing of a transponder (90) providing the return radiation from the scan direction and the time delay. The apparatus (70) may be used for improving road vehicle safety. [A2356]

"System and method for detecting an intruder using impulse radio technology"

An intrusion detection system and method are provided that can utilize impulse radio technology to detect when an intruder has entered a protection zone. In addition, the intrusion detection system and method can utilize impulse radio technology to determine a location of the intruder within the protection zone and also track the movement of the intruder within the protection zone. Moreover, the intrusion detection system and method can utilize impulse radio technology to create a specially shaped protection zone before trying to detect when and where the intruder has penetrated and moved within the protection zone. [A2357]

"Beam width display method and system"

A weather radar display system displays a beam indicator indicative of a radar beam. The beam indicator represents width of the radar beam as a function of range (distance from the radar beam source) . The beam indicator allows a pilot to easily discern accuracy of detected weather conditions based on the beam width. [A2358]

"Process and system for measuring the distance of a moving body from a fixed part"

A process and a system for measuring the distance of a moving body (12) from a fixed part (10) , characterized the steps of: generating a first alternating signal (r.sub. (t)) having a frequency within the radio-wave range or elastic-wave range, emitting the first signal from the fixed part towards the moving body (12) , receiving the first signal (r.sub. (t)) on the moving body (12) and generating, on the moving body (12) , a second signal (s.sub. (t)) having a frequency (nf) equal to the frequency of the first signal (r.sub. (t)) multiplied by a constant factor (n) , the second signal (s.sub. (t)) having an initial phase (.phi..sub.1) equal to the phase (2.pi.ft.sub.1 +.phi.) at the instant (t.sub.1) in which it is received by the moving body (12) , generating, on the fixed part, a third signal (u.sub. (t)) having a frequency (nf) equal to the frequency of the second signal (s.sub. (t)) and an initial phase (.phi..sub.0) equal to the initial phase of the first signal (r.sub. (t)) , and determining the variation in distance of the moving body (12) in a pre-set time interval as a formation of the variation in the amplitude of an alternating signal obtained from the sum of the second signal (s.sub. (t)) and the third signal (u.sub. (t)) in the same time interval. [A2359]

"Method and device for detecting and evaluating objects in the vicinity of a motor vehicle"

A method and a device for acquiring and evaluating objects in the area surrounding a vehicle, in which, using at least one radar sensor, the target objects in a monitoring area are acquired, and in at least one evaluation unit the distance data and/or velocity data of the target objects are evaluated. The acquisition of the target objects takes place within a virtual barrier that can be modified in its distance from the vehicle and in its length, and, using a transmission signal of a pulse radar sensor, the receive signal reflected from the target object can be evaluated in one or more receive channels so that different locus resolutions and different dimensions with respect to the distance and the length of the virtual barrier can be achieved. [A2360]

"Environmental location system"

A system and method for determining a location. The system employs encoded information devices dispersed through the environment, each having, a non-unique code associated therewith. The codes from the encoded information devices are acquired as a reading device passes nearby, and stored. The codes from a proximate set of information devices are correlated with a map or mapping relation to determine one or more consistent positions within the environment. The information devices are preferably passive acoustic wave transponders and the mapping relation may be a pseudorandom sequence or a defined map. [A2361]

"Method and device for mismatch recognition in a vehicle radar system or a vehicle sensor system"

A method for detecting misalignment in a motor vehicle sensor system, in which signals are emitted, signals reflected by a stationary object are received, and a relative angle and a relative distance or a longitudinal displacement and a transverse displacement between the detected object and a reference axis of the motor vehicle as well as a relative velocity between the detected object and the motor vehicle are determined on the basis of the signals emitted and received. A correction value is determined for the relative angle on the basis of the relative angle, the relative distance, and a velocity of the vehicle in question or on the basis of the longitudinal displacement, the transverse displacement, and the vehicle's own velocity. [A2362]

"System and method for position determination by impulse radio using round trip time-of-flight"

A system and a method for position determination by impulse radio using a first transceiver having a first clock providing a first reference signal and a second transceiver placed spaced from the first transceiver. The system determines the position of the second transceiver. The second transceiver has a second clock that provides a second reference signal. A first sequence of pulses are transmitted from the first transceiver. The first sequence of pulses are then received at the second transceiver and the second transceiver is then synchronized with the first sequence of pulses. A second sequence of pulses are transmitted from the second transceiver. The first transceiver receives the second sequence of pulses and the first transceiver is synchronized with the second sequence of pulses. A delayed first reference signal is generated in response to the synchronization with the second sequence of pulses. A time difference between the delayed first reference signal and the first reference signal is then measured. The time difference indicates a total time of flight of the first and second sequence of pulses. The distance between the first and the second transceiver is determined from the time difference. The direction of the second transceiver from the first transceiver is determined using a directional antenna. Finally, the position of the second transceiver is determined using the distance and the direction. [A2363]

"Backscatter transponder interrogation device"

A backscatter transponder interrogator, comprising a transmitter, emitting an interrogation signal for interacting with a backscatter transponder within an interrogation field, a plurality of antennas, each having a different and complementary property, such that a backscatter response from a backscatter transponder is likely to be preferentially received by at least one of said at least two antennas, a receiver, selecting an output from a selected antenna, and demodulating the backscatter response to produce an information signal, and a digitally controlled oscillator, producing an output controlling said transmitter and employed by said receiver to demodulate the backscatter response. The interrogator may have a plurality of transmit antennas. The antennas may have respectively different polarization properties, e.g., horizontal and vertical polarization. The interrogator may implement null steered polarization cancellation to distinguish between backscatter transponders within the interrogation field. [A2364]

"Mine detector and inspection apparatus"

A mine detector is provided for detecting buried land mines safely and promptly. A sensor head (12) is connected to a detector body (1) through hinges (11-1 to 11-4) and arms (12-1 to 12-3) . The sensor head (12) includes a transmitting and receiving means for emitting electromagnetic impulses to the ground within a range of detection of land mines. When the transmitting and receiving means receives electromagnetic waves reflected from a land mine, information on the three-dimensional structure of the land mine buried under the ground is generated on the basis of the time of arrival of the reflected wave, the level of the reflected wave and the x and y coordinates of the transmitting and receiving means, and the information is displayed on a display (1) . The detector is also applicable to the inspection of steel rods and bars for concrete reinforcement. [A2365]

"Microwave flow sensor for a harvester"

A flow sensor for use in a harvester is disclosed. The flow sensor has a microwave transceiver for transmitting a microwave signal and receiving a reflected microwave signal, an in-phase mixer electrically connected to the microwave transceiver for combining the transmitted microwave signal and the reflected microwave signal and outputting an in-phase Doppler signal, a quadrature mixer electrically connected to the microwave transceiver for combining the transmitted microwave signal and a delayed reflected microwave signal and outputting the quadrature Doppler signal, and an electronic circuit electrically connected to the in-phase mixer and the quadrature mixer and having a flow rate output. [A2366]

"Method and apparatus for detecting multiple objects with frequency modulated continuous wave radar"

A method and an apparatus for multiple object detection by automotive FMCW radars provides distance and relative velocity information. A two chirp frequency sweep with small slope difference is utilized and, since the difference is small, the distance information can be obtained by automatically eliminating the Doppler frequency. Therefore, the distance and the relative velocity information for each of multiple objects can be calculated without ambiguity. [A2367]

"Vehicle safety sensor system"

A vehicle safety sensor allows a vehicle operator such as a truck driver to detect the presence of adjacent objects in order to avoid collision with same. In one embodiment, three detection ranges providing feedback with various lights and sounds can be used with separate sensors, with some sensors automatically made "live" upon reversing or turning of the vehicle, and some sensors being manually activated, such as when a overpass is encountered. [A2368]

"Ground penetrating radar incorporating a real-time multi-target direction finding capability"

The Ground Penetrating Radar (GPR) system introduced in this application provides data from an underground medium of the same caliber as that provided by conventional radars in air or space applications. This includes direction as well as distance to all targets, and some indication of target shape and orientation, within a conical volume of the underground having a solid angle of about 90 degrees and a radial depth of about 100 feet, under ideal conditions, as depicted in FIG. 9. The key to this capability is depicted in FIG. 3, and is a hemispheric dome (6) which is placed against the smoothed surface (1) of the underground medium (2) , and which has a relative dielectric constant (E.sub.R) substantially equal to that of the underground medium (2) . A microwave horn antenna (3) , which is filled with the same dielectric material (5) as that from which the dome is constructed, is placed against the surface (7) of this dome (6) and is moved back and forth (8) , allowing the radar beam (9) of the horn antenna (3) to systematically scan the entire conical volume. The signal path of this radar antenna system is thus completely within a dielectric material having an (E.sub.R) comparable to that of the underground medium, from Coax-to-Waveguide transition through to the potential underground targets. No air-to-dielectric interface, with its reflections and refractive lensing effects, remains. [A2369]

"High-order high-frequency rough surface scattering solver"

The present invention provides a rough surface scattering method and solver for efficiently computing electromagnetic scattered fields resulting from an incident wave (12) being reflected from a surface slowly varying on the scale of the wavelength (10) . The wavelength claimed approach to high-frequency scattering is based on the use of expansions of high order in parameter .lambda., wavelength of the incident radiation. The resulting high-order expansion approach expands substantially on the range of applicability over low order methods, and can be used in some of the most challenging cases arising in applications. The surface current (14) induced by the incident wave (12) is represented as a high-order high-frequency expansion (20) . The surface current ansatz is substituted into the surface current integral equation (22) , wherein a surface current series expansion is formed (24) having, a high frequency order. The surface current series expansion includes an oscillatory integral and surface current coefficients. An asymptotic expansion of the oscillatory integral is produced having a Taylor series (26) . The Taylor series is evaluated and the surface current coefficients (32) determined. The surface current coefficients are inserted into the surface current series expansion. The surface current series expansion is evaluated to yield the surface current (36) . Finally, the scattered field is computed based upon the solved surface current (36) . [A2370]

"System and method for coherent array aberration sensing"

A system and method for sensing phase errors in a multiple receiver array use three non-collinear transmitters transmitting first, second, and third signals to a target and receiving corresponding signals reflected from the target using the multiple receiver array. In one embodiment, each transmitter transmits a characteristic signal which can be distinguished from each other by the receivers. In one embodiment, each transmitter transmits a slightly different monotone frequency that is preferably outside any imaging bandwidth. The sheared products computed from heterodyne measurements at the receivers in the array based on the reflected signals from the three transmitters are used to determine and correct for the combined transmitter/receiver phase errors at each of the receivers in the array. [A2371]

"Vehicle back-up aid system"

A warning system that warns an operator of an impending collision with an object while the operator is backing up. The system scans behind the vehicle with an emitter/sensor system and determines a time-to-collision with the object based on distance to the object and vehicle speed. Based upon the time-to-collision, a simple combination of visual and audio signals is designed to let the operator known of the imminency of a collision with the object so that the operator may react and make appropriate countermeasures. [A2372]

"Local wireless digital tracking network"

The present invention provides a method for the real-time location of a multiplicity of Mobile Units by correlating a commanded radio signal from the specific Mobile Units received by multiple fixed antennae. The Mobile Units are equipped with a transceiver that is activated by an encoded broadcast and responds with a burst transmission on a separate frequency that is received by several well-surveyed antennae at slightly different times due to the variable distance of the Mobile Units to the Fixed Receiver antennae. The location of a Mobile Unit is determined by resolving the burst transmission time delay differences from at least four fixed antennae to eliminate the common system unknowns. [A2373]

"Synthesis of total surface current vector maps by fitting normal modes to single-site HF radar data"

Systems and methods are described for synthesis of total surface current vector maps by fitting normal modes to radar data. A method includes extracting a scalar data set from a radar signal from a radar. Velocity components are calculated from the radar signal. The velocity components are fitted to a set of scalar eigenfunctions and eigenvalues to simultaneously solve for the best set of normal modes and the corresponding set of constants. The corresponding set of constants represent a corresponding set of amplitudes. The set of constants and the set of normal modes are used to create a two dimensional vector field used in creating a total vector map. [A2374]

"Object recognition system"

An object recognition system including a radar, an image sensor and a controller is provided. The radar determines the position of an object, and the image sensor captures an image of the object. The controller sets a processing area within the image captured by the image sensor based on the position of the object determined by the radar and a predetermined size for the object to be recognized. The controller extracts horizontal and vertical edges from the processing area, and preferably judges whether each of the extracted edges belongs to the object based on characteristics of the object to be recognized. The controller then recognizes the outline of the object based on the edges judged to belong to the object. The object can be recognized by determining upper, lower, left and right ends of the object. On the other hand, the controller recognizes lane lines defining the lane in which the vehicle mounting the system of the invention is running. Thus, the relative position of the object to the lane lines is determined by comparing the intersections between a horizontal line corresponding to the lower end of the object and the lane lines with the left and right ends of the object. [A2375]

"Apparatus and method for imaging objects with wavefields"

This invention describes a method for increasing the speed of the parabolic marching method by about a factor of 256. Firstly, to form true 3-D images or 3-D assembled from 2-D slices. Secondly, the frequency of operation can be increased to 5 MHz to match the operating frequency of reflection tomography. This allow the improved imaging of speed of sound which in turn is used to correct errors in focusing delays in reflection tomography imaging. This allows reflection tomography to reach or closely approach its theoretical spatial resolution of 1/2 to 3/4 wave lengths. A third benefit of increasing the operating frequency of inverse scattering to 5 MHz is the improved out of topographic plane spatial resolution. This improves the ability to detect small lesions. It also allow the use of small transducers and narrower beams so that slices can be made closer to the chest wall. [A2376]

"System for measuring the distance and the relative velocity between objects"

System for measuring the distance and the relative speed between objects using electromagnetic waves, having means for emitting electromagnetic waves from a first object and having means for receiving reflected electromagnetic waves from at least one second object, the frequency of the emitted signal being modulated in such a way that the modulation frequency, during a first time segment, increases approximately linearly from a first to a second modulation frequency value, that the modulation frequency, during a second time segment, is approximately constant, that the modulation frequency, during a third time segment, decreases approximately linearly from the second to a third modulation frequency value, that the modulation frequency, during a fourth time segment, is approximately constant, and that these time segments recur repeatedly, at least one of the modulation frequency values and/or the duration of at least one time segment being changeable. [A2377]

"Device for detecting objects in the area surrounding a vehicle"

A device which can accurately detect even objects in very close proximity to a vehicle and at the same time can reliably detect more distant objects has means (MM) that can execute a selection of those reception pulses (EI) whose chronological offset in comparison to the respective transmission pulses (SI) emitted is of such a magnitude that these reception signals (EI) result exclusively from reflections against objects from a selected distance range correlating to the chronological offset. Means (DG) are also provided that permit the transmission pulse power to be increased and decreased as the distance range rises and falls. [A2378]

"Fast fourier transform signal processing method for doppler radar speed sensor"

A vehicle speed sensing system includes an RF transceiver coupled to an antenna for transmitting an RF signal towards the terrain over which the vehicle moves and for receiving a reflected Doppler signal therefrom. The transceiver generates a time-domain in-phase reference signal I and a time-domain quadrature signal Q which is offset in phase by 90 degrees from the reference signal I. A digital signal processor which receives the I and Q signals, and uses a complex fast Fourier transform routine to convert the time domain I and Q signals to frequency domain values I (f) and Q (f) . The digital signal processor further processes the I (f) and Q (f) values and generates a speed a direction signal which is unaffected by vehicle vibrations. [A2379]

"Vehicle back-up and parking aid radar system"

An improved vehicle radar system and control aids the vehicle driver during both parking and back-up maneuvers. The radar system is equipped with both long range and short range radar detection antennas, an RF switch for selecting the active antenna, and a range bin having a depth that is adjustable "on the fly". The back-up aid function is provided by activating the RF switch to select the long range antenna and setting the range bin to a relatively large depth to cover the long range in a short time. The parking aid function is provided by activating the RF switch to select the short range antenna, and setting the range bin to a relatively short depth to achieve high close range accuracy. [A2380]

"System for data transfer between moving objects and fixed stations"

System for data transfer between one or more objects moving along a path and one or more fixed communication stations located along said path, wherein each object is provided with a transmitter/receiver combination, the transmitter of which is coupled to an identity code generator and the receiver of which is coupled to a data processing unit, and wherein each communication station is provided with a transmitter/receiver combination, the transmitter of which is coupled to a message generator and the receiver of which is coupled to an identity code recognition unit, wherein the transmitter/receiver of each object is continually activated, at least in the vicinity of the communication station, such that successively, in an alternating series of first and second periods, the transmitter transmits an identity code, originating from the identity code generator, in a first period and the receiver is ready to receive any responses in a second period, wherein, furthermore, the receiver of each station is continually activated until an identity code has been received, which code is recognized by the recognition unit, after which the message generator and the transmitter are activated in order to transmit any message intended for the object having this code. [A2381]

"Object detecting device, and travel safety system for vehicle"

Stationary objects are determined from objects detected by a radar device mounted on a vehicle. Objects detected with a dispersion in the level of the reception of a reflected wave at a relative distance in a range of 20 m to 100 m that is equal to or smaller than a first threshold value, are extracted from the extracted objects, and objects existing on a predicted course for the vehicle is extracted from the extracted objects. Further, it is determined if one of the extracted objects detected with rate of decrease in level of reception at a relative distance in a range of 10 m to 20 m is equal to or larger than a second threshold value and with a level of reception equal to or smaller than a third threshold value is an object which provides no hindrance even if the vehicle passes over the object. A warning or an automatic braking is discontinued or moderated based on the type of object. Thus, it is possible to precisely determine whether the object detected by the radar device mounted on the vehicle is an object particularly providing no hindrance even if the vehicle travels astride the object as it is, or whether it is an object the contact of the vehicle with which is required to be avoided, thereby carrying out a precise warning or automatic braking. [A2382]

"System and method for barrier proximity detection"

A system for barrier proximity detection, comprising a short-range detection (SRD) sensor, a barrier proximity detection system (BPDS) controller, and an operator display and control. The SRD sensor mounted on the vehicle detects the distance to objects and transmits a distance signal to the BPDS controller. The BPDS controller provides an operator control signal to the operator display and control for the driver's use. The BPDS controller may also store preset alarms, distance setpoints, or desired ranges for repeated use. The operator display and control may be a gradient alert display with audible alarms or an alphanumeric display to indicate the distance to an object with a preset target distance. The method provides the steps of measuring a desired range between the front of a vehicle and a barrier and storing the desired range in the BPDS, then using the desired range to provide a clear indication to the driver. [A2383]

"Vehicle adaptive cruise control system and method"

An automatic cruise control system and method for a host vehicle that includes a vehicle follow mode when the host vehicle detects an in-path vehicle and an auto-resume mode for accelerating to a driver set speed upon elimination of the in-path vehicle from the host vehicle path. The auto-resume mode includes a determination of the traffic density around the host vehicle and reduces the rate of acceleration for higher traffic densities. [A2384]

"Path following using bounded beacon-aided inertial navigation"

A high-resolution path marking system utilized with inertial navigation systems for land vehicles. The system uses radio frequency tags or "beacons" to mark a route to be traversed by manned or unmanned follower vehicles. The RF tags serve as references to correct time and distance traveled dependent errors that accumulate in the follower vehicle's inertial navigation system. The position of each tag is accurately encoded into its memory using a manned path marking vehicle that "proofs" the route in advance of the follower vehicles. Since the inertial navigation system for the path marking vehicle and for the follower vehicles are synchronized at the start of the route, any errors accumulated in the followers' INS with respect to the path marking vehicle are eliminated at the prescribed intervals where the RF tags are placed. The path marking vehicle can lay the route days, weeks, or even months in advance of use by the follower vehicles. Once the path is marked, it can be reused many times by the follower vehicles without further human intervention. Further, the short-range, ground based RF tags used in this method are less susceptible to jamming, and the tags are covert, i.e. the tags are small and transmit only when interrogated by a secure query signal. [A2385]

"Digital beamforming for passive detection of target using reflected jamming echoes"

A radar system and method for detecting and tracking a target of interest in the presence of interference, wherein the interference emits interfering signals, includes a receiver for receiving the interfering signals directly from the interference. The receiver also receives reflected signals, wherein the reflected signals is the interfering signals reflected by the target of interest. The interfering signals and the reflected signals are compared to detect the target of interest. In one embodiment, the reflected signals and the interfering are cross-correlated. The results of the cross-correlation are used to obtain range, position, and velocity information about the target of interest from a range/Doppler map. [A2386]

"System and method for processing radar data"

A system for processing radar data from two or more areas of interest is provided, such as for simultaneously processing vehicle speeds in the opposite lane in front of the patrol vehicle and in the opposite lane behind the patrol vehicle. The system includes an antenna signal processor that receives radar data from one or more radar antennae and generates speed data for a first vehicle travelling in a first direction relative to a radar observation point and a second vehicle travelling in a second direction relative to the radar observation point. A display generator system receives the speed data and user-entered display control data, and generates user-readable display data based on the speed data and the user-entered display control data. [A2387]

"Object detection system"

An object detection system, in particular for a motor vehicle, is described where the object detection system is a combination of at least three object detectors, each having a different detection zone and/or a different detection range. [A2388]

"Dual mode transmitter-receiver and decoder for RF transponder tags"

An enhanced backscatter RF-ID tag reader system and multiprotocol RF tag reader system is provided. In a multiprotocol mode, the system emits a non-stationary interrogation signal, and decodes a phase modulated backscatter signal by detecting a stronger phase component from quadrature phase representations or determining phase transition edges in a phase of a received signal. The RF tag reader system predicts or follows the phase of the backscatter signal, thereby avoiding interference from nulls in the received signal waveform due to the non-stationary in terrogation signal, relative movement or environmental effects. An acoustic RF-ID tag detection system detects the reradiated signal corresponding to respective transformation of a signal in the tag. Detection of either type of RF-ID tags therefore is possible, and the absence of any tag or absence of any valid tag also determined. [A2389]

"Device and method for contactlessly measuring speed on surfaces"

A device for non-contractual measurement of the speed of an object moving over a surface comprises a means for radiating a signal of fixed frequency at an angle onto the surface in or against the direction of motion, said angle being variable by the movement of the object, and for receiving a Doppler-shifted signal reflected at the surface. A means is provided for combining a plurality of reflected Doppler-shifted signals, which are received in temporal succession, so as to produce a combined spectrum. The device for non-contractual speed measurement additionally comprises a means for detecting from the combined spectrum the spectral portion having the highest or lowest frequency and exceeding a predetermined signal power, and a means for deducing the speed from the frequency of the detected spectral portion. [A2390]

"Vehicle operation assist control system"

In a vehicle operation assist control system for assisting a vehicle operator to operate a vehicle, a distance to the obstacle and a width of the obstacle are detected by a radar or the like, and, when an obstacle is detected, the system determines an evasion path and accordingly modifies the map information available to the system. Therefore, the system, being aware of the situation, would not interfere with the vehicle operator taking an evasive action. The evasive path may be defined as a curvature which changes as a sinusoidal mathematical function of the position of the vehicle along the path. The control system may be based on a yaw rate control or a vehicle side slip angle control. [A2391]

"System and method for intrusion detection using a time domain radar array"

A system and method for highly selective intrusion detection using a sparse array of time modulated ultra wideband (TM-UWB) radars. Two or more TM-UWB radars are arranged in a sparse array around the perimeter of a building. Each TM-UWB radar transmits ultra wideband pulses that illuminate the building and the surrounding area. Signal return data is processed to determine, among other things, whether an alarm condition has been triggered. High resolution radar images are formed that give an accurate picture of the inside of the building and the surrounding area. This image is used to detect motion in a highly selective manner and to track moving objects within the building and the surrounding area. Motion can be distinguished based on criteria appropriate to the environment in which the intrusion detection system operates. [A2392]

"Three-dimensional questing method, three-dimensional voxel data displaying method, and device therefor"

In a three-dimensional exploring method for finding location of a buried object by transmitting a wave signal (4) by means of e.g. an electromagnetic wave into the ground (1) and receiving the signal reflected from the object (2) in the course of movement over the ground surface and generating three-dimensional voxel data in the form of coordinates (x, y, t) consisting of a position (x, y) and a reflection time (t) based on intensity of the reflected signal, the method effects an object voxel selecting step of selecting one or more object voxels in accordance with a manual input operation, a binarizing step of extracting a candidate voxel group consisting of a plurality of voxels interconnected with each other and having amplitude values of positive or negative polarity and having magnitudes greater than a predetermined threshold, and a connecting/composing step of extracting, from the candidate voxel group extracted by the binarizing step, a connection-candidate voxel group to be connected to the object voxels selected by the object voxel selecting step and connecting said connection-candidate voxel group with said object voxels thereby to compose an object voxel group, whereby the location of the buried object (2) is detected at high S/N ratio. Further, when three-dimensional voxel data contains.a voxel deficient in data, the method effects, on said deficient voxel, a one-dimensional linear interpolation step of effecting a one-dimensional linear interpolation in a predetermined direction in an x-y plane including said deficient voxel, so that the deficient voxel can be interpolated easily. [A2393]

"Pre-crash assessment of crash severity for road vehicles"

A method of pre-crash prediction of the severity of an imminent crash of road vehicles is disclosed using a pre-crash sensor, a computer system coupled with pre-crash vehicle condition signal sources and a vehicle communication system onboard each of two vehicles involved in a crash. The method includes the steps of determining that a collision of the vehicles is imminent, exchanging vehicle crash-related information between the vehicles when an imminent collision is determined, computing crash-defining information onboard each vehicle and predicting onboard each vehicle the severity of the imminent collision whereby occupant protection devices of the vehicles may be deployed in accordance with the predicted severity. [A2394]

"Apparatus and method for rail track inspection"

An apparatus for inspecting an operational condition of a rail track from a railcar includes an antenna positioned on the railcar that directs radar signals toward the rail track and collects radar signals returned from the rail track. A radar transceiver is connected to the antenna and supplying the radar signals to the antenna. The radar transceiver receives radar returned signals from an interaction of the radar signal with the rail track. A controller is connected to the radar transceiver for controlling transmission of the radar signals from the radar transceiver and receipt of the radar returned signals. A signal processing unit is connected to the controller and a sensor unit that supplies input data to the signal processing unit. The signal processing unit processes at least the input data and the radar returned signal to produce processor output data and to determine the operational condition of the rail track. [A2395]

"Vehicle control method and vehicle warning method"

In order to occur a collision warning to prevent the collision in accurate by detecting the preceding vehicle or target, a vehicle lane position estimation device comprising a means for measuring a distance between said host vehicle and said preceding vehicle or a oncoming vehicle, a direction angle from said host vehicle, an angular velocity and a velocity of said host vehicle, a means for calculating lateral and longitudinal distance between said host vehicle and said preceding vehicle or said oncoming vehicle, a means for capturing a front stationary object, a means for obtaining movement of the preceding vehicle or position of the oncoming vehicle, and a means to estimate a lane position of said front stationary object from a relationship of the stationary object being captured and the preceding vehicle being obtained and a positional relationship with the oncoming vehicle. [A2396]

"Miniature, unmanned remotely guided vehicles for locating an object with a beacon"

Apparatus for and method of locating a subject being monitored as to whereabouts. A beacon having a radio frequency transmitter and receiver is attached to the subject. At least three scanning platforms each having a radio receiver and transmitter and, optionally, an onboard microprocessor and an atomic clock, issue signals which will evoke response signals from the beacon. A central station having a microprocessor, radio receiver and transmitter, and preferably, a display or other output for annunciating location of the sought subject, manages the search. At least one scanning platform is a miniature, unmanned, remotely a piloted vehicle, preferably an aircraft, which passes over a predetermined search area. Response signals from the beacon, when received at a scanning platform, are processed to enable determination of location of the beacon and hence the sought subject by triangulation. Time and location data are acquired by interaction with the global positioning system by the scanning platforms. Alternatively, a single mobile scanning platform can locate the beacon by localization, wherein characteristics of response signals are analyzed and processed. [A2397]

"Road-shape recognition system"

A radar device operates for emitting a detection wave ahead of a vehicle, and detecting objects in response to echoes of the emitted detection wave. A reflector detecting device operates for detecting reflectors among the objects detected by the radar device. The detected reflectors are located along a road. A reflector-row extracting device operates for, in cases where there are a plurality of rows of the reflectors detected by the reflector detecting device in one side of the vehicle, extracting one from among the reflector rows. A road-shape recognizing device operates for recognizing a shape of the road on the basis of the reflector row extracted by the reflector-row extracting device. [A2398]

"Flexible wave guide joint"

A flexible wave guide joint is located between a transceiver and oscillating antenna in a vehicular collision warning system. The flexible joint includes a multiple portion wave guide feed. One portion of the wave guide feed is fixed in position and coupled to the transceiver while another portion of the wave guide feed is coupled to the moving antenna. The wave guide feed portions are separated by an air gap to permit oscillation of the antenna relative to the transceiver. [A2399]

"Probe mapping diagnostic methods"

A method and apparatus for processing a time domain reflectometry (TDR) signal having a plurality of reflection pulses to generate a valid output result corresponding to a process variable for a material in a vessel. The method includes the steps of determining a reference signal along a probe in the vessel, establishing a first fiducial reference point, a reference end of probe location, a measuring length and a maximum probe length. The method also includes the steps of periodically detecting a TDR signal along the probe, establishing a second fiducial reference point, a detected end of probe location, an end of probe peak to peak amplitude, and attempting to determine a process variable reflection on the TDR signal. The method indicates a broken cable condition, a loss of high frequency connection, a low amplitude reflection condition, an empty vessel condition. Distances and locations on the reference signal are computed in relation to the first fiducial reference point, and distances and locations on the TDR signal are computed in relation to the second fiducial reference point. [A2400]

"System and method for remote monitoring utilizing a rechargeable battery"

A method and a system for remotely monitoring a person includes a portable unit including a self-recharging battery, the portable unit being adapted to monitor a biological parameter and a physical location of the person, a global positioning satellite transmitting global positioning system (GPS) data to the portable unit, and a central unit disposed remotely from the portable unit, the central unit being in communication with the portable unit via a ground station. [A2401]

"Emergency flashing light mechanism"

An emergency flashing light mechanism includes one or more emergency flashing lights, a processor, a transmitter, and a receiver. The emergency light flashing mechanisms can exchange information with the vehicles, pedestrians and other components of a traffic complex via their respective transmitters and receivers. The emergency flashing light mechanisms can process such information and override control lights having red, yellow and green lights. The emergency flashing lights can selectively respond to emergency vehicles. [A2402]

"Radio-interrogated surface-wave technology sensor"

Radio-interrogated surface-wave technology sensor, in which the sensitive element (12) is an impedance which is electrically connected as termination to a surface-wave structure (26) of the sensor. [A2403]

"Method and apparatus for ultra precise GPS-based mapping of seeds or vegetation during planting"

An ultra precise seed planter apparatus and method for generating a centimeter accuracy map of the location of seeds or vegetation as they are planted from an agricultural planting machine. The apparatus is fitted with a GPS receiver feeding a data logger, and optical sensors that are placed adjacent seed or vegetation dispenser. The data logger monitors GPS time and UTM coordinates, as well as the optical sensors. Ground speed and azimuth are also monitored. The seeds or vegetation are time-tagged as they are dispensed, and software is used to process the dispensing time and GPS location data and estimate the exact coordinates of each seed or plant and its distance from adjacent seeds or plants. As a result, a precise planting map is generated. The invention may also be used to determine the location to dispense seeds or vegetation, and activating the dispenser when that location is reached. [A2404]

"Method and apparatus for recognizing shape of road"

A transmission wave is applied to a predetermined angular range in a width-wise direction of a vehicle. Object-unit data pieces containing at least data pieces representing distances to objects in correspondence with vehicle-width-wise direction angles are generated on the basis of a reflected wave. A determination is made as to whether each object is moving or stationary on the basis of a speed of the vehicle and a relative speed of the object. From the object-unit data pieces, ones are extracted which are effective for road shape recognition on the basis of a result of determining whether each object is moving or stationary. Ones of the extracted object-unit data pieces which represent monotonically increasing distances as viewed along one of clockwise and counterclockwise angle directions are grouped to generate data representing a road-side-object group. A road edge is recognized on the basis of the data representing the road-side-object group. [A2405]

"Motor vehicle warning and control system and method"

A system and method assists the driver of a motor vehicle in preventing accidents or minimizing the effects of same. In one form, a television camera is mounted on a vehicle and scans the roadway ahead of the vehicle as the vehicle travels. Continuously generated video picture signals output by the camera are electronically processed and analyzed by an image analyzing computer, which generates codes that serve to identify obstacles. A decision computer mounted in the controlled vehicle receives such code signals along with code signals generated by the speedometer or one or more sensors sensing steering mechanism operation and generates control signals. Such code signals may be displayed, and a synthetic speech or special sound generating and warning means used, to warn the driver of the vehicle of approaching and existing hazards. The system may also use the control signals, particularly through application of fuzzy logic, to control the operation of the brakes and steering mechanism of the vehicle to avoid or lessen the effects of a collision. In a particular form, the decision computer may select the evasive action taken from a number of choices, depending on whether and where the detection device senses other vehicles or obstacles. [A2406]

"Satellite method for using radar interferometry to establish a digital terrain model"

The invention relates to a method which consists in launching one behind the other on two close orbits two satellites (S1, S2) each equipped with a high-resolution synthetic aperture radar observing the Earth under an angle of incidence of at least 40.degree., such that the radars observe independently of each other the same strip of terrain, with time interval not more than 10 seconds, preferably of not more than 4 seconds, and preferably not less than 2 seconds between their respective observations. [A2407]

"Method of envelope detection and image generation"

A method of detecting objects reflecting impulse waveforms of generating a detection envelope by receiving a reflected waveform, delaying said waveform by a peak-to-zero delay (PZD) interval. The PZD interval is the time between a maximum energy displacement in the impulse waveform and an adjacent zero crossing. The reflected waveform and its delayed version are squared and then summed to create the envelope. If the envelope is to be defined in terms of voltage, the root of the sum of the squares may be found. Also a method for generating an image using the PZD interval in back-projection techniques is described wherein a sampling point is chosen on each of a plurality of reflected waveforms. The values of the samples are summed and the waveforms are delayed by the PZD interval and the values of the sampling points are again summed. The two sums are squared and added together to generate an image envelope. [A2408]

"Method and apparatus for generating notification of changed conditions behind a vehicle"

According to the present invention, methods and apparatus are provided to generate notification about condition changes behind a vehicle. Information about a first set of conditions behind a vehicle is gathered at a first point in time. Information can be gathered using imaging devices, infrared detectors, distance meters, light intensity sensors, and timing devices. At a later point in time, information about a second set of conditions behind the vehicle is gathered. The information gathered at a first point in time is compared to the information gathered at the later point in time to determine differences between the conditions behind the vehicle. If the differences meet a notification criterion, a notification is generated conveying information about the changed conditions behind the vehicle. [A2409]

"Non-invasive, opto-acoustic water current measurement system and method"

A method and system are provided for measuring water current. An acoustically-modulated beam of radiation is transmitted to a target location on the surface of a body of water. As the beam transits the water, acoustic radiation propagates away from the beam towards the surface and experiences a Doppler shift in frequency relative to the acoustic frequency used for modulation. The Doppler shift is caused by current in the water through which the acoustic radiation transits. The Doppler-shifted frequency is measured as an indication of water current. [A2410]

"Ocean altimetry interferometric method and device using GNSS signals"

A method for performing Earth altimetry comprising the steps of: receiving by an upward-looking antenna onboard a platform above the Earth surface, direct signals having at least two different carrier frequencies transmitted by GNSS satellites in view of the upward-looking antenna, receiving by a downward-looking antenna onboard the platform signals reflected by the Earth surface and having the at least two different carrier frequencies, comparing carrier phases of the direct signals and received reflected signals, at the carrier frequencies, and determining from the phase comparisons a surface height. [A2411]

"Radio system for characterizing and outlining underground industrial developments and facilities"

Most mines and underground facilities employ standardized construction techniques and materials. Such also cannot avoid having some above ground openings to receive utilities, fresh air, supplies, etc. Those or other surface openings are also universally used to discharge ground water, wastes, and other materials. Typical underground facilities have abundant electrical wiring and power demands, both of which can be detected at the surface. Levees with leakage pathways also form electrical conductors. When properly illuminated with remotely generated electromagnetic (EM) radiation, many of these features will "glow" or reradiate the radio energy in an electronic signature unique to the underground facility. Synchronized EM-gradiometer transponders are situated nearby on the ground surface to collect and analyze the "glow". Alternative transmitting devices further includes ways to generate the illumination, and computers for characterizing the return signatures. [A2412]

"Method for detecting and correcting non-linearities in radio-frequency, voltage controlled oscillators"

A method for detecting and correcting non-linearities in radio-frequency, voltage controlled oscillators provides for digitization of the frequency signal by feeding the undelayed frequency signal and a delayed frequency signal generated therefrom into EXOR gates. The digital pulses produced thereform are converted using a low pass filter into a proportional DC voltage value which is proportional to the oscillator frequency and is used as a basis for producing a correction value for the frequency control of the oscillator. [A2413]

"Method and system for displaying target vehicle position information"

A system and method for displaying target vehicle position that combines the data available from a plurality of surveillance sensors. Data from the plurality of sensors is fused to calculate a composite target position and a projected track for each vehicle within the range of the sensors. The composite data is also used to calculate a boundary of certainty for both the position and the projected track. The position, projected track and the boundaries of certainty for each target vehicle can be displayed on a display screen. [A2414]

"Device for representing a control situation determined by a motor vehicle distance control device"

A device for representing on a display device a control situation determined by a motor vehicle distance control device, the distance control device being connected to a sensor which detects the coordinates and the relative speed of the obstacles located ahead of the motor vehicle and relays them to the distance control device, which determines the expected lane of the motor vehicle, the distance control device determining from these data a control object with reference to which the distance of the motor vehicle is controlled. Referring lso a device referring the multiplicity of the data required for distance control in a motor vehicle can be checked in a simple way for their correctness, the distance control device (3) is connected to a display control device (14) which converts the data detected by the sensor (9) and calculated by the distance control device (10) into an approximately true-to-scale plan view of the control situation ahead of the vehicle (1) , which is displayed on the display device (15) . [A2415]

"Path prediction for vehicular collision warning system"

A motor vehicular collision warning system including a scanned beam sensor, a signal processor, and a vehicle interface system that initiates warnings to the driver or adaptively controls the vehicle. Scene data is used to predict the path of the roadway in front of a subject vehicle. Reflections from manmade and natural scene objects are extracted from the scene data to define a linear feature edge. Once the feature edge is determined, the predicted path of the subject vehicle can be determined using information regarding the vehicle trajectory and the feature edge. [A2416]

"Noncoherent gain enhancement technique for non-stationary targets"

A radar system and radar processing method includes a number of aspects for providing improved function. The system and method may employ one or more of the following aspects: timely range-velocity (range-Doppler) compensation for target nonstationarity by integration along hypothesized range-Doppler trajectories, allowing noncoherent integration over an elongated time interval, noncoherent integration of an enlarged signal set obtained from overlapped coherent processing intervals (CPIs) , hypothesized joint multiple accelerations used to generate multiple hypothesized range-Doppler trajectories, and sliding window integration to increase data output rates with use of large noncoherent integration intervals (NCIs) . These aspects allow for improved signal-to-noise ratios, for acquisition and tracking of targets at longer ranges, and for improved target parameter estimation. [A2417]

"Apparatus and method for liquid level measurement in a sounding tube"

A level sensing apparatus for attachment to a vessel to measure levels of contents in a tank of the vessel. The level sensing apparatus includes a housing, a transmitter disposed within and operatively connected to said housing, and an antenna operatively connected to the transmitter for directing electrical and/or mechanical waves in a direction away from the transmitter. The antenna is further adapted to receive electrical and/or mechanical waves. The level sensing apparatus further includes a mounting system affixing the level sensing apparatus to a vessel. The mounting system is adapted such that the mounting system can be placed in a first position while the transmitter is affixed to the vessel, wherein levels of contents in a tank can be measured with electrical and/or mechanical waves, or in a second position while the transmitter is affixed to the vessel, wherein levels of contents in a tank can be measured manually. [A2418]

"Dual mode transmitter-receiver and decoder for RF transponder tags"

An enhanced backscatter RF-ID tag reader system and multiprotocol RF tag reader system is provided. In a multiprotocol mode, the system emits a non-stationary interrogation signal, and decodes a phase modulated backscatter signal by detecting a stronger phase component from quadrature phase representations or determining phase transition edges in a phase of a received signal. The RF tag reader system predicts or follows the phase of the backscatter signal, thereby avoiding interference from nulls in the received signal waveform due to the non-stationary interrogation signal, relative movement or environmental effects. An acoustic RF-ID tag detection system detects the reradiated signal corresponding to respective transformation of a signal in the tag. Detection of either type of RF-ID tags therefore is possible, and the absence of any tag or absence of any valid tag also determined. [A2419]

"Method and device for measuring distance and speed"

Signals are emitted with a FMCW sensor system, are received after reflection at targets and are processed to form a measured signal whose frequency spectrum is analyzed. Discrete, equidistant samples are stored and are arranged in a double Hankel matrix in the existing sequence. This matrix is diagonalized with a singular value decomposition, and an approximation is identified taking only the "principle values" into consideration, in order to calculate the frequencies and their amplitudes therefrom according to known methods. [A2420]

"Self calibration of transponder apparatus"

A method and apparatus is provided for remotely and constantly calibrating a transponder by using the ring around phenomenon. A number of different time varying physical quantities, such as for example temperature, signal level, noise, transmission line flex, frequency, and general operational effects, affect the inherent delay in transponders on a time varying basis. The invention relies on a the ring around phenomenon to produce pulse doublets, wherein the distance between the pulses in the pulse doublets correspond to the instantaneous delay in the transponder. The system is configured so that instantaneous variation in the transmission delay is detected and recognized on a pulse by pulse basis and transmitted to the interrogation device, which then functions to calculate the actual delay. Normal operation of the transponder is not affected by the continuous calibration method, and therefore a special calibration mode is not required. [A2421]

"Method and arrangement for mapping a road"

Arrangement and method for mapping a road during travel of a vehicle having two data acquisition modules arranged on sides of the vehicle, each including a GPS receiver and antenna for enabling the vehicle's position to be determined and a linear camera which provides one-dimensional images of an area on the respective side in a vertical plane perpendicular to the road such that information about the road is obtained from a view in a direction perpendicular to the road. A processor unit forms a map database of the road by correlating the vehicle's position and the information about the road. Instead of or in addition to the linear cameras, scanning laser radars are provided and transmit waves downward in a plane perpendicular to the road and receive reflected waves to provide information about distance between the laser radars and the ground for use in forming the database. [A2422]

"Method and device for detection of em waves in a well"

A method for detecting electrical properties in a geological formation in a well which has within it a tubing string comprising the steps of mounting a transmitter antenna outside of the tubing string in a fixed position with respect to the geological formation, mounting a receiving antenna outside of the tubing string in a fixed position with respect to the geological formation, generating a first series of electromagnetic waves at a first time, receiving a first series of reflected electromagnetic waves in the receiver antenna, transforming the first series of reflected electromagnetic waves to form a first registration, generating a second series of electromagnetic waves at a second time, receiving a second series of reflected electromagnetic waves in the receiver antenna, transforming the second series of reflected electromagnetic waves to form a second registration, and comparing the registrations. Also disclosed is a device for accomplishing the method. [A2423]

"Method and apparatus for determining location of objects based on range readings from multiple sensors"

The invention is a method and apparatus for determining the locations of a plurality of actual objects based on the output of a plurality of range sensors. A multiplicity of range measurements are obtained from a plurality of sensors, each sensor capable of providing a multiplicity of range measurements. The range measurements from the plurality of sensors are correlated with each other to generate a list of potential objects and to order that list of potential objects from highest to lowest likelihood of being an actual object. The order may be based upon a cumulative error of the individual sensor measurements upon which the potential object is based. The ordered list of potential objects is then pared down to a smaller list of actual objects by assuming that the potential object highest in the ordered list as an actual object, and then removing from the list all other lower-ordered potential objects that are based on any of the range measurements upon which the selected object is based. The process is repeated for the next highest potential object remaining on the list until all potential objects on the list have either been selected as an actual object or removed from the list. [A2424]

"Using host vehicle dynamics for side-looking automotive pre-crash sensor aiming control"

The antenna of a side-looking pre-crash sensor (12) is aimed, either electronically or mechanically, in correlation with the travel velocity of a host vehicle (10) . As the forward travel velocity of the host increases, the antenna beam (16) remains aimed laterally, but in an increasingly forward direction. [A2425]

"Ground-penetrating imaging and detecting radar"

A ground-penetrating radar comprises a single resonant microstrip patch antenna (RMPA) that is driven by a three-port directional coupler. A reflected-wave output port is buffered by a wideband isolation amplifier and a reflected-wave sample is analyzed to extract measured values of the real and imaginary parts of the load impedance-the driving point impedance of RMPA. Each such port will vary in a predictable way according to how deeply an object is buried in the soil. Calibration tables can be empirically derived. Reflections also occur at the interfaces of homogeneous layers of material in the soil. The reflected-wave signals are prevented from adversely affecting transmitted-signal sampling by putting another wideband isolation amplifier in front of the input port of the directional coupler. A suppressed-carrier version of the transmitted signal is mixed with the reflected-wave sample, and the carrier is removed. Several stages of filtering result in a DC output that corresponds to the values of the real and imaginary parts of the load impedance. The suppressed-carrier version of the transmitted signal is phase shifted 0.degree. or 90.degree. to select which part is to be measured at any one instant. [A2426]

"Composite device for vehicle"

The object of the present invention is to provide a composite apparatus in which a meter for a vehicle and an obstacle alarm device for a vehicle share a constituting means common to the meter and the obstacle alarm device. The meter and the obstacle alarm device share a buzzer-driving circuit (40) of and a buzzer (50) . [A2427]

"Use of third party ultra wideband devices to establish geo-positional data"

A system, method and article of manufacture are provided for determining a location of a wireless device in a wireless communication system. In general, an initial request is transmitted to wireless devices having known locations for positioning information so that a location can be determined for a first wireless device having an undetermined location. Those wireless devices with known locations that receive the initial request in turn transmit positioning information to the first wireless device. If positioning information from less than a sufficient number of wireless devices with known location is received by the first mobile wireless device, an additional request is then transmitted for responses from these responding other wireless devices. After responses to the request from one or more of these responding other wireless devices are received, communication then occurs with at least a portion of the responding wireless devices to obtain information relating to the distance between the first wireless device and the responding wireless devices it is communicating with. Next, a location of the first wireless device is estimated using the information obtained from these responding other wireless devices and the positioning information received from the wireless devices with known locations. [A2428]

"Object recognition apparatus"

This invention relates to an object recognition apparatus. This apparatus comprises an antenna which emits transmission beams toward a plurality of directions, a receiving circuit which receives reflected signals of the transmission beams from predetermined directions, a distance and direction calculation circuit which calculates distance and direction to objects reflecting the transmission beams based on the transmission beams and the reflected signals, an object pattern storage unit which stores range direction patterns of reflected signals obtained in advance with respect to predetermined objects, an object recognition circuit which compares range direction patterns of the reflected signals received by the receiving circuit with respect to the predetermined directions, with the range direction patterns stored in the object pattern storage unit, and which recognize that a pair of reflected signals from two neighboring directions are signals reflected by the same object. [A2429]

"Apparatus and method for locating objects under a body of water"

An apparatus (10) and method adapted for locating objects under a body of water comprising a frame structure (12) and at least one sensor assembly (16) connected thereto. The sensor assembly (16) is pivotally coupled to the frame structure (12) and includes a rigid member (20) and a geographic location system receiver (42) connected thereto. An arm member (22) is connected to the rigid member (20) and an object detection device (38) is associated with the arm member (22) . The object detection device (38) is operable to detect a density change indicative of an object under the body of water, said object detection device (38) being further operable to emit a signal (46) indicative of the detection of an object under the body of water relative thereto based density change sensed thereby, and its position is known relative to the position of the GPS receiver (42) . The geographic location receiver (42) is operable to emit a signal (50) indicative of the present position of the receiver (42) . An electronic controller (48) coupled to both the object detection device (38) and the geographic location receiver (42) is operable to both receive signals (46, 50) therefrom and to output a signal (52) indicative of the location of the object detected under the body of water. [A2430]

"Driver augmented autonomous braking system"

An enhanced autonomous emergency braking system includes an accelerator pedal operated by the driver and used to control the overall vehicle speed. When a forward detection apparatus detects an imminent contact, the braking system automatically applies braking force to the vehicle while the vehicle engine speed is reduced. The amount of brake force applied is a continuous function of relative speed, relative distance, collision probability and target classification. The braking force may be reduced when the driver or passenger are unbuckled or may be disabled if the driver depresses the accelerator pedal by a predetermined amount. In addition, the amount of brake force applied by the driver is amplified to further enhance braking performance. [A2431]

"Method for determining control data for deploying restraint elements in a vehicle prior to a collision"

A method is indicated according to which the triggering of a restraining device or devices in a vehicle can be adjusted to specific characteristics of the vehicle involved in the impending crash in such a way as to furnish optimum protection for the vehicle occupants. To this end, before a crash between two vehicles, each vehicle transmits data concerning its own vehicle-specific characteristics that can affect the course of the crash, and each vehicle receives the vehicle-specific data transmitted by the other vehicle and derives from them control data for triggering its restraining device or devices. [A2432]

"Method and apparatus for disabling an airbag system in a vehicle"

Apparatus for disabling an airbag system for a seating position within a motor vehicle in which occupant sensors are situated adjacent or on a roof above the seat and the presence or absence of an occupant of the seating position is detected using the occupant sensor (s) . The airbag system is disabled if the seating position is unoccupied. The position of an occupant is detected if the seating position is occupied and the airbag system is disabled if the occupant's position would result in injury to the occupant greater than any injury resulting from non-deployment. Further, the airbag deployment parameters, e.g., rate of inflation and time of deployment, may be modified based on the occupant's position to adjust inflation of the airbag according to proximity of the occupant to the airbag door. [A2433]

"High-frequency dual-channel ground-penetrating impulse antenna and method of using same for identifying plastic pipes and rebar in concrete"

An antenna system for ground-penetrating radar use, comprising first and second co-located antenna element pairs orthogonally oriented with respect to each other. Each of the element pairs includes a transmit element and a receive element. A metallic enclosure (such as a box) shields the element pairs and is open on one side to face a structure to be probed by signals from the transmit elements. The transmit and receive elements are dimensioned, shaped and arranged (a) to achieve low mutual impedance between the elements, (b) to have high sensitivity to reflected signals received from the structure being probed, and (c) to accommodate a desired rise time of a transmit pulse. The transmit elements and receive elements preferably are electrical dipoles but they may also be magnetic dipoles such as slot antennas. When electrical dipoles are employed, they may be formed of elongated diamond-shaped conductive surfaces or be of other appropriate geometries. The transmit and receive elements are positioned within the box and the box dimensioned such that (a) reflections from a top of the box reinforce transmitted signals and (b) the impedance at the feedpoints of the transmit and receive elements is relatively stable as the antenna system is moved over the structure being probed. [A2434]

"Radar-field-of-view enhancement method and apparatus for matching field-of-view to desired detection zone"

A radar field-of-view enhancement method particularly adapted for vehicle radar detection systems having a specified detection zone. In accordance with the invention, a pair of discrete radar beams are employed having differing arc widths. Return signals from the discrete beams are compared and related to the area of a desired detection zone. This approach increases the reliability of detection in the detection zone while minimizing false alarms and missed detection areas. The beams are alternately switched on using discrete sources or by implementing a discrete phase shifting element interposed between the sources. [A2435]

"Mounting for proximity radar"

A sensor carrier assembly for supporting one or a plurality of sensors to facilitate mounting the plurality of sensors to the vehicle. The sensors are mounted to a carrier or mounting beam which is then in turn mounted directly to the vehicle. The mounting beam mounts directly to the vehicle and a bumper covers the mounting beam. Alternatively, the sensor mounts externally to a vehicle body part, such as a bumper. Fastening points for attaching the carrier assembly to the vehicle are preferably placed in proximity to the sensors to assist in maintaining proper orientation of the sensors. [A2436]

"Device and process for measuring distance and speed"

A device and process for measuring distances and/or speeds between a motor vehicle and several objects, like mobile targets and fixed targets, has an FMCW radar system, where the motor vehicle transmits a signal, whose transmitting frequency is modulated with at least two frequency ramps. A device detects the receiving signals from the objects and determines the respective straight lines and the intersecting points of these straight lines in a speed-distance diagram. A sorting device sorts out the intersecting points from fixed targets and the related straight lines. A device outputs the distances and/or the speeds, which correspond to the other intersecting points. [A2437]

"Radar device for detecting response signal"

When a question signal of a transmitting frequency band .DELTA.F1 output from a radar device is received in search and rescue radar transponder (SART) of a wreck ship, a response signal is sent from the SART to the radar device. In the radar device, the response signal and an echo of the question signal are received as a reception signal, intensity of components of the reception signal placed in almost the same frequency band as the transmitting frequency band .DELTA.F1 of the question signal is suppressed to produce a filtered response signal, and components of he filtered response signal placed in a receiving frequency band .DELTA.F2, which does not overlap with the transmitting frequency band .DELTA.F1 of the question signal, are extracted from the filtered response signal as an image signal. Therefore, sea clutter and ground clutter indicated as the echo of the question signal is hardly included in the image signal, and a position of the wreck ship can be detected by using the image signal excellent in a signal-to-noise ratio. Accordingly, the radar device excellent in a detection performance of the position of the wreck ship can be obtained. [A2438]

"Interrogation of an object for dimensional and topographical information"

Disclosed are systems, methods, devices, and apparatus to interrogate a clothed individual with electromagnetic radiation to determine one or more body measurements at least partially covered by the individual's clothing. The invention further includes techniques to interrogate an object with electromagnetic radiation in the millimeter and/or microwave range to provide a volumetric representation of the object. This representation can be used to display images and/or determine dimensional information concerning the object. [A2439]

"Apparatus for detecting turbulent layer"

A turbulent layer detecting apparatus in accordance with the present invention is equipped with a transmitting section that transmits beams of electromagnetic waves, sound waves or light waves into the atmosphere, a receiving section that receives the electromagnetic waves, the sound waves, or the light waves that have been transmitted by the transmitting section and scattered by particulates or the like in the atmosphere, a wind velocity measuring section that measures a beam direction component of a wind velocity at two or more observation points on a beam from a received signal received by the receiving section, or a density measuring section that measures a density at two or more observation points on the beam, and a turbulent layer detecting section that detects the presence of a turbulent layer on the basis of the output of either the wind velocity measuring section or the density measuring section. [A2440]

"Carrierless ultra wideband wireless signals for conveying application data"

A method for conveying application data via carrierless ultra wideband wireless signals, and signals embodied in a carrierless ultra wideband waveform. Application data is encoded into wavelets that are transmitted as a carrierless ultra wideband waveform. The carrierless ultra wideband waveform is received by an antenna, and the application data is decoded from the wavelets included in the waveform. The waveforms of the signals include wavelets that have a predetermined shape that is used to modulate the data. The signals may convey, for example, Web pages and executable programs between mobile devices. The signals are low power and can penetrate obstructions making them favorable for use with a wireless node of a network. [A2441]

"Vehicle travel safety apparatus"

When a turning state of a subject vehicle is detected, the action timing of the contact avoidance support device is slower than when the turning state is not detected. When an action timing determining part 22 estimates that there is the possibility of the subject vehicle coming into contact with the vehicle in front and a turning state of the subject vehicle is detected based on the output from a transversal acceleration sensor S4, a changing rate of the steering angle sensor S5, and a yaw rate sensor S3, a compensation interval calculating part 23 calculates a compensation interval depending on the size of the detected turning state (the amount of the steering angle, the changing rate of the steering angle, and the transversal acceleration) . The action timing of the brake actuator 12 is slowed by this compensation interval. [A2442]

"Combination passive and active speed detection system"

A combination passive and active detection system including a passive speed and range detection system able to sense the speed and range of a moving object and an active speed detection system able to sense the speed and range of a moving object. The passive speed detection system is preferably an electro-optical speed and range detection system. The active speed detection system is preferably a laser speed and range detection system. The combination detection system preferably is selectively operable in a dual operational mode, a "passive-only" operational mode, and "active-only" operational mode, a triggering operational mode, and an active recording operational mode. [A2443]

"Data recovery system for radio frequency identification interrogator"

An RF/ID interrogator is provided for recovering a data signal from an RF/ID tag. The interrogator includes a radio having a receiver portion to receive in-phase (I) and quadrature-phase (Q) signals from the RF/ID transponder transmitted at a predetermined bit-rate, and a processor coupled to the radio for controlling operation of the radio in accordance with stored program instructions. In one embodiment, the interrogator performs over-sampling of the data signal received from the RF/ID tag in order to provide a high data recovery rate. The processor controls the over-sampling of the I and Q signals at a sampling rate higher than the transmitted bit-rate of the I and Q signals to provide plural signal samples that are stored in a buffer memory. The processor compares the relative polarity of successive ones of the plural signal samples. Based on this comparison, data bits are derived from the successive ones of the plural signal samples in correspondence with the number of the successive ones of the plural signal samples having same relative polarity. In another embodiment, the interrogator performs a selection between the I and Q signals in order to achieve optimum data recovery. The processor detects relative signal strength of the I and Q signals, and selects one of the I and Q signals for subsequent processing based on the detected relative signal strength. Data bits are then recovered from the selected one of the I and Q signals. [A2444]

"Patrol speed acquisition in police Doppler radar"

A process and apparatus to automatically determine whether a police radar is installed in a vehicle which has a coupling between a vehicle speed sensor and the police radar. The process automatically, without any operator input, determines the correct ratio between the true ground speed and the frequency output by vehicle speed sensor at that ground speed. The process and apparatus then use that ratio and the frequency from the vehicle speed sensor to establish a software search window that limits the speed range of the search by the police traffic radar for the true ground speed. [A2445]

"Transceiver assembly used in a Doppler-based traffic radar system"

A transceiver assembly is provided for use in a Doppler-based traffic radar system for determining the speed of at least one target. The transceiver assembly includes a cover for receiving therein at least some of the component parts of the transceiver assembly. In other words, the cover is positioned over the component parts of the transceiver assembly which are enclosed by a cap removably attached to the cover. A conical antenna horn and turnstile waveguide cavities are formed from a unitary material. The circuitry associated with the transceiver assembly is modularized such that the circuitry may be removed from the transceiver assembly, or more specifically separated from the microwave components of the transceiver assembly, for testing. [A2446]

"Highly integrated single substrate MMW multi-beam sensor"

A multiple beam array antenna system comprises a plurality of radiating elements provided from stripline-fed open-ended waveguide coupled to a Butler matrix beam forming network. The Butler matrix beam forming network is coupled to a switched beam combining circuit. The antenna can be fabricated as a single Low Temperature Co-fired Ceramic (LTCC) circuit. [A2447]

"Method for locating a concealed object"

Apparatus and methods are disclosed for detecting anomalies in microwave penetrable material that may be used for locating plastic mines or pipes underneath the ground. A transmitter is positioned at a plurality of different positions above the ground. A microwave signal is transmitted that is stepped over a plurality of frequencies. At each position, a plurality of reflections are received corresponding to each of the plurality of frequencies that were transmitted. A complex target vector may be produced at each position that contains complex values corresponding to magnitude, phase, and time delay for each of the plurality of reflections received at that location. A complex reference data vector may be produced, either based on predetermined values or based on data from the received plurality of reflections. A comparison is made between the complex target vector and the complex reference data vector to produce a channel vector. In one embodiment, an operator may be applied to the channel vector such as a complex filter matrix or to add a complex conjugate. A response signal is produced and anomalies are detected by variations in the response signal with respect to the plurality of positions. [A2448]

"Timing and control and data acquisition for a multi transducer ground penetrating radar system"

A multi-channel digital equivalent time sampling (MDETS) device having a programmable logic control that can select, delay or create various triggered signals. The MDETS can function independently or with multiple devices allowing for synchronized acquisition of data. The close proximity of MDETS device to a transmitter and receiver allows for the short time delay for acquiring the data. [A2449]

"Electromagnetic wave radar device mounted on a car"

An electromagnetic wave radar device mounted on a car, which helps improve external appearance of a car without impairing radar function, and is fabricated using a decreased number of parts at a reduced cost. The electromagnetic wave radar device comprises an electromagnetic wave radar body 1 mounted on a car 2 and for transmitting and receiving electromagnetic waves of a predetermined frequency, and a radome portion made of a material which permits the electromagnetic waves to transmit through and covers the electromagnetic radar body, the electromagnetic wave radar body being disposed on the side of the back surface 30A of the bumper 30 of the car, and the radome portion being formed by a portion of the bumper of the car. [A2450]

"Ground penetrating radar system for non-invasive inspection of trees for internal decay"

The method for examining trees comprises directing ground penetrating radar signals into a tree using a radar apparatus connected to a microprocessor control and data acquisition unit via an interface. The tree to be examined is scanned with the radar unit after the radar velocity for that tree is calibrated. The tree is scanned at a selected elevation either by moving a single radar unit along the bark of the tree in a circumferential manner or by moving a radar signal transmitter substantially diametrically opposed to a radar signal receiver along the bark of the tree in a circumferential manner. The microprocessor control and data acquisition unit controls the radar unit and stores and digitizes radar signals for generating a real-time radargram. A cross-sectional map of the tree, a map of the severity, shape, size and location of internal decay and a map of the thickness of remaining wood are then generated from the radargram and the ensemble of saved radar signals. The maps generated from this method may then be examined by tree diagnosticians to determine the extent of the internal damage of the tree. [A2451]

"Method and device for regulating clearance for a vehicle"

The present invention relates to a method for regulating clearance for a vehicle, in which a relative velocity (v.sub.rel) and a relative distance (a) between the vehicle and a second vehicle driving ahead are detected, and a control signal for an adaptive cruise control device is generated from these quantities. The control signal being derived from a danger criterion (G) is determined from the relative velocity (v.sub.rel) and the relative distance (a) , this danger criterion which is weighted with an adaptive factor (AF) representing the individual driving behavior of a vehicle driver, and a control signal initiating a deceleration of the vehicle is generated when the danger criterion (GF) , weighted with the adaptive factor and adapted to the vehicle driver, falls below a defined threshold value (S) . [A2452]

"Slot antenna element for an array antenna"

A multiple beam array antenna system comprises a plurality of radiating elements provided from stripline-fed open-ended waveguide coupled to a Butler matrix beam forming network. The Butler matrix beam forming network is coupled to a switched beam combining circuit. The antenna can be fabricated as a single Low Temperature Co-fired Ceramic (LTCC) circuit. [A2453]

"Position location method and apparatus for a mobile telecommunications system"

In a cellular mobile telecommunications system the position of a mobile station can be estimated in terms of its bearing and range from a cell site. A multi-element direction finding antenna at the cell site receives signals from the mobile station and a receiver circuit estimates the bearing using the relative phase of signals received at different antenna elements and estimates the range by measuring round trip delay of signals to and from the mobile station. Motion of the mobile station can introduce errors into the bearing estimate due to frequency offset and frequency spread when element sampling is non-simultaneous. Compensation for these errors is introduced by using signal samples successively received at the same antenna element to estimate Doppler frequency offset and spread. It is necessary to ensure accurate calibration of the direction finding antenna and the receiver circuit. This is done by injecting calibration signals into the circuit near the antenna or into the antenna itself from a near field probe. Other aspects of calibration, such as antenna position, are calibrated using a remote beacon. A beacon emulating a mobile station but at a fixed, known location, or a beacon at an adjacent cell site may be used. [A2454]

"Phase-based sensing system"

A system for sensing and measuring the relative motion of an object, comprising a transceiver device configured to transmit a signal toward an object, a plurality of detectors offset in phase to receive the transmitted signal and a reflected signal, and a processor configured with logic to measure a phase shift resulting from the relative motion of the object between the transmitted signal and the reflected signal at the plurality of detectors, wherein the processor is further configured with the logic to relate the phase shift to the relative motion of the object. [A2455]

"System and method for tracking and monitoring prisoners using impulse radio technology"

A system, apparatus and method are provided that utilize the communication capabilities and positioning capabilities of impulse radio technology to overcome the shortcomings in conventional prison monitoring systems. Basically, the present invention enables prison personnel to track the movements of a prisoner and/or monitor the vital signs of a prisoner using impulse radio technology that is well suited for a prison environment. [A2456]

"GPS vehicle collision avoidance warning and control system and method"

GPS satellite (4) ranging signals (6) received (32) on comm1, and DGPS auxiliary range correction signals and pseudolite carrier phase ambiguity resolution signals (8) from a fixed known earth base station (10) received (34) on comm2, at one of a plurality of vehicles/aircraft/automobiles (2) are computer processed (36) to continuously determine the one's kinematic tracking position on a pathway (14) with centimeter accuracy. That GPS-based position is communicated with selected other status information to each other one of the plurality of vehicles (2) , to the one station (10) , and/or to one of a plurality of control centers (16) , and the one vehicle receives therefrom each of the others' status information and kinematic tracking position. Objects (22) are detected from all directions (300) by multiple supplemental mechanisms, e.g., video (54) , radar/lidar (56) , laser and optical scanners. Data and information are computer processed and analyzed (50,52,200,452) in neural networks (132, FIGS. 6-8) in the one vehicle to identify, rank, and evaluate collision hazards/objects, an expert operating response to which is determined in a fuzzy logic associative memory (484) which generates control signals which actuate a plurality of control systems of the one vehicle in a coordinated manner to maneuver it laterally and longitudinally to avoid each collision hazard, or, for motor vehicles, when a collision is unavoidable, to minimize injury or damage therefrom. The operator is warned by a heads up display and other modes and may override. An automotive auto-pilot mode is provided. [A2457]

"Measuring circuit for a capacitive sensor for distance measurement and/or space monitoring"

In a measuring circuit for a capacitive sensor for distance measurement and/or space monitoring comprising sensor wire and shielding electrode, a sine signal is applied to the shielding electrode. The sensor wire is connected, via a shielded cable, with one input of an input amplifier which serves as current-voltage converter and whose supply voltage is likewise influenced by the sine signal. The output of the input amplifier is connected with one input of a phase-dependent rectifier arrangement, the sine signal is applied to the other input of the phase-dependent rectifier arrangement, and its output is connected to an analog-to-digital converter. [A2458]

"Method for controlling the average speed of a vehicle"

A method for controlling the average speed of a vehicle over a predetermined time period, or indefinitely, or distance length is described with reference to selecting a desired average speed, measuring an actual speed, and maintaining a cumulative error determined as a function of the difference between the average speed and actual speed and the time over which the actual speed measurement was taken. Based on the cumulative total of speed-time error, a compensatory speed is calculated that will reduce the cumulative speed-time error to an acceptable tolerance range within a selected period of elapsed time. Although particularly applicable to competition situations in which an average speed is dictated for use over a particular competition course, the average speed controlling method can be used in other situations where the average speed of a vehicle must be controlled. [A2459]

"Method of selecting a preceding vehicle, a preceding vehicle selecting apparatus, and a recording medium for selecting a preceding vehicle"

The radius of the curvature of the lane on which a subject vehicle is traveling, is calculated in accordance with the turning condition of the subject vehicle and the velocity of the subject vehicle is obtained on the basis of the steering angle, and the yaw rate. An instantaneous probability of the same lane that the recognized object target exists on the same lane is calculated. In this operation, the instantaneous probability is compensated. That is, the road shape is recognized with delineator or the like. The instantaneous probability of the same lane is compensated on the basis of the recognized road shape. The probability of the same lane is calculated after a predetermined filtering process with the compensated instantaneous probability of the same lane. The preceding vehicle is selected on the basis of the probability of the same lane. [A2460]

"Distance indicating device and method"

A distance indicating device having at least one energy wave generator. Each of the generators have a focusing device to produce a directional focused beam of wave energy. Each of the wave generators have a means for mounting the generator to a vehicle and a means for adjustively positioning the generator to intersect or impact an object at a predetermined distance from the generator or the vehicle on which it is mounted utilizing the point of intersection or impact to determine the distance between the vehicle and a fixed object. An improved method for indicating the distance between a vehicle and a fixed object is also provided utilizing the focused energy wave beam generators of the improved distance indicating device of the invention. [A2461]

"Article tracking system"

System for tracking mobile tags. Cell controllers with multiple antenna modules generate a carrier signal which is received by the tags. Tags shift the frequency of the carrier signal, modulate an identification code onto it, and transmit the resulting tag signal at randomized intervals. The antennas receive and process the response, and determine the presence of the tags by proximity and triangulation. Distance of a tag from an antenna is calculated by measuring the round trip signal time. The cell controllers send data from the antenna to a host computer. The host computer collects the data and resolves them into positional estimates. Data are archived in a data warehouse, such as an SQL Server. [A2462]

"Method and apparatus for measuring velocity and turbulence of atmospheric flows"

A method and apparatus for measuring the parameters of atmospheric turbulent flows utilizes the Doppler shifted frequencies of received radar signals backscattered from sound generated aerodynamically by atmospheric turbulent flows. Doppler frequency bandwidths of the received backscattered signals are used to estimate the atmospheric flow turbulence and the mean frequency within a bandwidth is processed to estimate its radial flow velocity. Total flow velocity and the flow velocity angle with respect to the antenna boresight of the atmospheric turbulent flow may be estimated by estimating the radial flow velocity at two radial positions and processing these radial velocities. Processing of the Doppler data is initiated when the total signal power within the Doppler frequency band exceeds a predetermined power level. [A2463]

"Method and apparatus for activating a crash countermeasure in response to the road condition"

A system for sensing a potential collision of a first vehicle (11) with a second vehicle (72) that transmits a second position signal. The first vehicle has a pre-crash sensing system (10) includes a memory (14) that stores vehicle data and generates a vehicle data signal. A first global positioning system (18) generates a first position signal corresponding to a position of the first vehicle. A first sensor (20) generating sensor data signals from the first vehicle. A receiver (22) receives a second position signal and a road condition signal from the second vehicle. A countermeasure system (40) is also coupled within the first vehicle. A controller (12) is coupled to the memory (14) , the global positioning receiver (18) the first sensor (20) and the counter measure system (40) . The controller (12) determines a distance to the second vehicle in as a function of the second position signal. The controller determines a first vehicle trajectory from the sensor data signals and the position signal. The controller (12) determines a threat level as a function of the distance, the first vehicle trajectory and the road condition signal and activates the counter-measure system in response to the threat level. [A2464]

"Excavator data acquisition and control system and process"

An excavator data acquisition and control system and process for characterizing the subsurface geology of an excavation site, and for utilizing the acquired data to optimize the production performance of an excavator is disclosed. A geologic imaging system and a geographic positioning system are employed to initially survey a predetermined excavation site or route. A geologic characterization unit may also be employed to enhance the geologic imaging data. The acquired data are processed to provide detailed geologic and position data for the excavation site and utilized by a main control unit to optimize excavator production performance. In one embodiment, the main control unit accesses a geologic filter database, which includes geologic profile data for numerous types of geology, when analyzing unknown subsurface geology. Removing geological filter data content corresponding to known geology from the acquired geologic imaging data provides for immediate recognition of unknown and suspect subsurface objects. The geologic imaging system preferably includes a ground penetrating radar system having a plurality of antennas oriented in an orthogonal relationship to provide three-dimensional imaging of subsurface geology. [A2465]

"Device for detecting angle of elevation error in a multiple beam radar sensor"

A method and a radar sensor for determining an elevation angle error of a multibeam radar sensor are described. In order to detect an elevation angle of the multibeam radar system with respect to a predefined target, a plurality of laterally arranged cutting planes at a predefined distance are formed. The values of the corresponding antenna diagrams in each plane are stored in a suitable form, for example, normalized and in a parametric form taking into account the elevation angle .alpha.. In order to reduce the size of the memory, it is sufficient to store one symmetry half for reasons of symmetry if additional information, for example, road clutter values are added, so that the upward or downward direction of the angle can be recognized. By comparing the measured echo values obtained by normalization and application of a quality factor, a corresponding elevation angle .alpha. is obtained for each cutting plane. Using an appropriate histogram, an angle for the maladjustment of radar sensor can be determined from the measured values stored over a longer period of time. [A2466]

"Flexible digital ranging system and method"

Systems and methods that may be used to determine the distance between an orbiting satellite and a ground station. A master clock divider circuit generates clock signals derived from a master clock. A transmit code generation circuit generates pseudo-random number codes and processes the pseudo-random number codes to produce a composite signal having positive and negative correlation peaks that is transmitted to the satellite as an analog signal. A digitizing circuit receives the analog signal transmitted from the satellite, and digitizes the analog signal. A frequency domain matched filter match filters the digitized analog signal to produce correlation peaks contained in the digitized analog signal. A central processing unit comprises a middle code software matched filter that generates an outer code bit, and computes the distance from the ground station to the satellite by calculating the difference between the time that the composite signal was received compared to the time that the composite signal was transmitted and dividing the difference value by the speed of light, and comprises an outer code software matched filter that produces a bit error rate signal indicative of the validity of the computed range value. [A2467]

"Secure I/P"

An improvement in the present radar/IFF equipment used by the military whereby the transponding equipment, when used in crypto-secure Mode 4, is enabled to reply with its unique coded identification number (Mode 2 reply) after it has made its Mode 4 reply. This is accomplished by adding an and gate and a delay means to the present equipment. The and gate is connected to couple the Mode 4 three-pulse interrogation to the delay means if it is received at the same time the I/P activate switch is in its operating position. The delayed three-pulse interrogation signal is coupled to the encoder and activates a Mode 2 reply. The ground equipment is also modified to enable it to faithfully reproduce the entire video output of its interrogator section. [A2468]

"Method and arrangement for obtaining and conveying information about occupancy of a vehicle"

Method and arrangement for obtaining and conveying information about occupancy of a passenger compartment of a vehicle including at least one wave-receiving sensor for receiving waves from the passenger compartment. Information about the occupancy of the passenger compartment is generated based on the waves received by the wave-receiving sensor (s) and transmitted, e.g., through a cellular phone system, to emergency response personnel to enable them to respond accordingly. The information about the occupancy of the passenger compartment may be generated by a processor applying pattern recognition techniques so that any occupants of the seat may be classified and such classification transmitted to the emergency response personnel. The wave received by the wave-receiving sensor (s) may also be used to determine the number of occupants in the vehicle and/or whether the occupants are moving after a crash. [A2469]

"Technique for estimating rainfall from a meteorological radar with polarization diversity"

Process for estimating a precipitation rate by means of a bipolar radar, characterized by the following various steps: the differential phase .PHI.dp and the attenuated reflectivity Z according to at least one of the polarizations H or V are measured by means of said bipolar radar, over a given interval [r.sub.1, r.sub.0] of path radius r with respect to said radar, an estimate of the value K (r.sub.0) of the attenuation at r.sub.0 is determined from the attenuated reflectivity profile thus measured, as well as from the difference in the differential phase between r.sub.0 and r.sub.1 , an estimate K (r) of the specific attenuation at r as a function of the attenuation K (r.sub.0) thus determined and of the attenuated reflectivity profile Z (r) is determined, the rate of precipitation R (r) is determined knowing K (r) . [A2470]

"Landmine locating system"

A landmine detection system comprises a ground-penetrating radar for probing the surface of the ground for landmines and other anomalies. The radar is swept back and forth across a lane while a user proceeds forward. A navigation sensor and processor keep track of all the parts of the lane that have been probed. A user display presents a visual graphic that represents the lane and the parts of it that have been probed. The user is then able to swing the radar to areas that are indicated as having been skipped in previous passes, e.g., to get 100%. coverage. [A2471]

"Apparatus and method for detecting radar obstruction"

An apparatus and method for detecting radar system blockage includes a radar system having an antenna unit configured to transmit radar signals and receive reflected radar signals. In one embodiment, fixed frequency continuous wave radar signals are transmitted, and corresponding reflected signals are sampled and processed to determine a mainbeam clutter signal peak in frequency bins near those corresponding to vehicle speed. If this peak is less than a power threshold, the antenna unit is at least partially blocked. In another embodiment, a number of most recent reflected tracking signal amplitudes are sampled, normalized to a predefined range value and filtered to produce a smoothed tracking amplitude. If the smoothed tracking amplitude drops below an amplitude threshold, the antenna unit is at least partially blocked. The two embodiments may be combined to determine a radar antenna blockage status as a function of both techniques. [A2472]

"Traveling-path estimation apparatus for vehicle"

An object in front of a vehicle is detected. At least one of a steering angle of the vehicle and a yaw rate thereof is detected. First curvature data are generated on the basis of at least one of the detected steering angle and the detected yaw rate. The first curvature data represent a course along which the vehicle will travel. A determination is made as to whether or not the detected object is a stationary object. In cases where the detected object is a stationary object, second curvature data are generated on the basis of the stationary object. The second curvature data represent a course along which the vehicle will travel. The first curvature data and the second curvature data are averaged. Third curvature data are generated in response to a result of the averaging. The third curvature data represent a course along which the vehicle will travel. [A2473]

"Doppler-based traffic radar system"

A Doppler-based radar system and related method are provided for determining the direction and speed of at least one selected target traveling in the same lane as a moving patrol vehicle supporting the radar system independent of the direction of the target relative to the platform. The radar system includes an oscillator to generate a signal, an antenna to transmit the signal toward the at least one target and to receive a return signal reflected from the at least one target, a turnstile in communication with the antenna for receiving the return signal and forming processing signals which are different in phase, and circuitry for determining the direction of the at least one target relative to the platform and the speed of the at least one target dependent upon a mode of operation of the radar system. [A2474]

"Bistatic radar system for centralized, near-real-time synchronized, processing of data to identify scatterers"

The bistatic radar system uses a scanning beam antenna located at the transmitter to transmit a focused beam of high frequency energy into a predefined space, with the transmitted beam comprising a series of pulses. The transmitter also includes apparatus for determining pulse origination data comprising: pulse origination time and direction of propagation for each of the pulses in the transmitted beam emanating from the antenna, where the antenna is scanned in a predetermined scan pattern in at least an azimuthal direction. The bistatic radar system also includes at least one receiver, located at a site remote from the transmitter and includes apparatus for generating pulse component receipt data indicative of receipt of components of the pulses that are contained in the transmitted beam that are reflected from scatterers in the predefined space. The receivers all transmit their data, substantially instantaneously, as received back to a central processor, which synchronizes (collates) the data in order to calculate, in near real-time, vector wind fields, divergence, vorticity, etc. These calculations typically are performed in polar coordinates or can be performed in Cartesian coordinates. Thus, the present bistatic radar system performs near-real-time synchronization, collating, transmission, and processing of data received from one or more bistatic receivers and from a transmitting radar to produce weather data in a more timewise efficient manner. [A2475]

"Radar apparatus"

The invention provides a man-portable, non-ground-contacting, ultra-wide band impulse radar system (1) , the system having separate transmit and receive antennae located in a common non-metallic housing (2) mounted at one end of a lightweight boom (3) , them being a data-processing computer and battery housing (4) mounted at the other end of the boom (3) end acting as a counterweight to the antennae system (2) , and the there being a data display and control unit (6) mounted generally centrally of the boom (3) , the boom (3) being attachable to an ergonomic hamess by which the whole may be carried by an Operator so that the data display and control unit (6) is in clear view of the Operator, and having one or more handle by which the whole may be grasped and swung from side to side while being so carried. [A2476]

"Traffic control system"

A satellite 10 in the sky has an imaging radar and a captured image data transmitting means, and captures an image of a predetermined subject area A including roads R. According to the captured image data concerning the subject area A, a traffic control section 21 grasps the state of traffic in the subject area A, and estimates a state of congestion according to thus grasped state of traffic. Also, according to thus estimated state of congestion, the traffic control section 21 sets parameters such as on/off times of signals. Thus set parameters are sent from the traffic control section 21 to their corresponding signals. The on/off of each signal is controlled according to the set parameters. Hence, the state of traffic in a wide area can be grasped quite accurately, and traffic can be controlled according to thus grasped state of traffic. [A2477]

"Method and apparatus for locating mobile tags"

A method and apparatus for determining tag location is disclosed. Tag reference data may be stored, e.g., in the form of a lookup table, as a trained neural network, and so on, and used to determine the location of tags. Readings used to determine tag location and/or preliminary tag locations may be filtered to produce reliable tag location indications. Packages of user configurable parameters can be provided and used for the filtering of the preliminary tag locations. Confidence levels may also be generated for determined tag locations and used, for example, to indicate how well an asset location system can distinguish between different tag locations. [A2478]

"Radar sensor having a CFAR detector"

A constant false alarm rate (CFAR) detector prevents false radar triggers due to RF interference by proportionally increasing the radar detection threshold as interference increases. The radar operates with a randomized PRF, which randomizes detected RF interference while maintaining echo signal coherence. Post-detection filters provide a signal channel and an interference channel. The interference channel augments the threshold of the signal threshold detector. The interference channel gain can be adjusted to ensure the detection threshold is always higher than noise in the signal channel, thereby eliminating false alarms due to RF interference. Accordingly, the CFAR detector eliminates a major false alarm nuisance, particularly in radar security sensors. Applications for the low-cost system include indoor and outdoor burglar alarms, automotive security alarms, home and industrial automation, robotics, and vehicle proximity sensors. [A2479]

"Method and apparatus for detecting vehicle stop"

A stop determination for a vehicle is provided by requiring simultaneous stop determinations by at least one wheel speed sensor providing output pulses at a rate inversely proportional to vehicle speed and a forward looking radar unit for sensing an object in the vehicle's path and providing a range rate signal with respect to that object. The determination is particularly useful when the time between consecutive pulses at a predetermined minimum speed indicative of an essentially stopped vehicle is greater than a predetermined maximum time period allowed for the determination. Each of the signals complements the other to provide a vehicle stopped determination that is more reliable than either can provide by itself and is workable for most purposes, including stop and go vehicle speed control. [A2480]

"Weather radar"

An antenna section radiates a pulse beam and receives its reflected wave, and a signal processing section observes a rain or cloud occurring region within a covered area based on a signal intensity of the reflected wave. In this case, to obtain wind direction and velocity information for the rain or cloud occurring region, the signal processing section observes Rayleigh scattering-induced Doppler echo components in that region to calculate the wind direction and velocity from a result of the observation. To obtain the wind direction and velocity information for a region other than the rain or cloud occurring area, the beam formed by the antenna section is directed toward the region to be observed so that the signal processing section can observe Bragg scattering-induced echo components based on a received signal of the reflected wave to calculate the wind direction and velocity from a result of the observation. [A2481]

"Radar field-of-view enhancement method and apparatus for matching field-of-view to desired detection zone"

A radar field-of-view enhancement method particularly adapted for vehicle radar detection systems having a specified detection zone. In accordance with the invention, a pair of discrete radar beams are employed having differing arc widths. Return signals from the discrete beams are compared and related to the area of a desired detection zone. This approach increases the reliability of detection in the detection zone while minimizing false alarms and missed detection areas. The beams are alternately switched on using discrete sources or by implementing a discrete phase shifting element interposed between the sources. [A2482]

"Vehicle periphery monitoring device"

A vehicle periphery monitoring device includes a transmitting circuit 3 for generating a transmission wave, an antenna 4 installed on the periphery or in the interior of a door mirror of a subject vehicle for radiating the transmission wave generated from the transmitting circuit as a formed beam having a directivity which propagates over a region expanding over an adjacent lane area from side portions of the subject vehicle toward the rear portion thereof, a receiving circuit 6 for receiving a reflected wave from an object which is in the periphery of the subject vehicle through an antenna 5, an arithmetically operating circuit 2 for arithmetically operating a distance between the subject vehicle and the object on the basis of a period of time required since the transmission wave generated from the transmitting circuit is radiated from the antenna until the transmission wave is reflected by the object and received by the receiving circuit and arithmetically operating a relative velocity from Doppler frequency of a received electric wave or a value of differential from an arithmetically operated distance to judge the risk of collision with the object on the basis of those arithmetically operated results, and LEDs 7 and 8 for announcing the judgement result of the arithmetically operating circuit 2 to a driver in response to the risk. [A2483]

"System and method for communication with radio frequency identification tags using tow message DFM protocol"

The system comprises a plurality of stationary sensors located in an array within certain physical areas. Each sensor comprises a plurality of antenna coils arranged in unique physical orientations and capable of transmitting radio frequency signals of differing phase. The RFID transponder includes an antenna which receives the signals generated by the antenna coils, and compares the phase of at least two of the signals to determined the relative position of the transponder. The antenna coils may emit two direction finding mode (DFM) signals in succession, the first signal with all antenna coils turned on, the second with a subset of the coils turned off. The spatial relationship of the transponder antenna and individual antenna coils precludes all of the signals in each sensor from being rejected by the transponder during emission of both the first and second DFM signal. [A2484]

"Efficient estimation of spectral moments and the polarimetric variables on weather radars, sonars, sodars, acoustic flow meters, lidars, and similar active remote sensing instruments"

A method for estimation of Doppler spectrum, its moments, and polarimetric variables on pulsed weather radars which uses over sampled echo components at a rate several times larger than the reciprocal of transmitted pulse length. The variables are estimated by suitably combining weighted averages of the over sampled signals in range with usual processing of samples at a fixed range location. The invention may be Used on pulsed weather radar, lidars, sonars and accoustic flow meters. [A2485]

"Signal processing method and apparatus, and sonar systems"

Signals entered from receiving transducer elements of 160 channels are multiplexed into 10 signal lines by 10 multiplexers. Each of 10 A/D converters converts the signals of 16 channels from analog from into digital form. The multiplexers are switched with synchronized switching timing to produce 10 pieces of sample data strings with the same timing. 160 pieces of sample data sampled in a steplike form are shifted in phase according to an oblique-line sampling scheme. The signal of the same channel is sampled twice with a phase delay of 90.degree. so that the signal can be converted into complex-valued sample data without increasing the number of processing circuits. [A2486]

"Method for measuring the speed of a vehicle"

The invention concerns a method and a device to measure the speed (v) of a vehicle relative to a road surface. To increase the accuracy of the speed measurement and in order to be able to determine the speed (v) of the vehicle independently of the diameter and the adhesion of a vehicle wheel on the road surface, the invention proposes that the speed (v) of the vehicle is measured directly on the road surface by utilizing the Doppler effect. [A2487]

"Radar device and on-vehicle radar device"

A radar device in which a much more precise demodulation can be made with an inexpensive circuit, free of the output variation of the frequency-modulated transmission signal. The radar device includes an oscillator which produces and outputs a frequency-modulated electromagnetic wave to a switching circuit by way of a directional coupler. The switching circuit uses switching modulation to radiate the electromagnetic wave from a transmitting antenna. The radiated electromagnetic wave after being reflected from an obstacle is received at a reception antenna. A mixer mixes this reception signal and a local signal fed from the directional coupler to produce a mixing signal which is to be fed to a high pass filter. The high pass filter deletes a low frequency output variation noise which is contained in the mixing signal and which occurs in the frequency modulation in the oscillator. The resulting mixing signal is, with the noise deleted, fed by way of an AC amplifier, to a switching demodulating circuit. [A2488]

"Ground penetrating radar system"

A ground penetrating radar system includes a cart configured to be movable along the ground. A computer is mechanically coupled to the cart. A radar electronics module is mechanically coupled to the cart and electrically coupled to the computer. A first antenna array is mechanically coupled to the cart, electrically coupled to the radar electronics module, and oriented to radiate into the ground and receive radiation from the ground. A second antenna array is mechanically coupled to the cart, electrically coupled to the radar electronics module, and oriented to radiate into the ground and receive radiation from the ground. A movement detector, which is configured to detect movement of the cart, is coupled to the computer. The computer is configured to trigger the radar electronics module when the computer detects that the cart has moved a predefined distance. The system uses nearfield beam forming, which is accomplished through fully coherent signal processing and synthetic aperture reception and processing, to image buried objects in three dimensions. The system displays a plan, or top, view and a side view of the area being scanned to provide a three dimensional perspective on a two dimensional computer screen. [A2489]

"Positional data utilizing inter-vehicle communication method and traveling control apparatus"

Predicted future positions are calculated (S11) and arranged into packets (S12) to be transmitted using a communication pattern (for example, a PN series) based on a time and a position of each packet (S13) . Another vehicle calculates its predicted position (S21) and generates a communication pattern based on a result of calculation (S22) so that the generated communication pattern is utilized for reception (S23) . Consequently, data associated with a future position of its own can be selected for enabling reception. An existence probability is calculated, and the state of another vehicle can be accurately understood from the communication of the calculated existence probability, thereby effectively reducing chance of collision. [A2490]

"Method and apparatus for pre-crash threat assessment using spheroidal partitioning"

A method for operating a pre-crash sensing system for a vehicle having an object detecting system and an associated data storage. The method includes partitioning the vehicle operating environment into a plurality of zones wherein each zone represents a different area surrounding the vehicle. In response to detecting an object within any one of the zones, the method activates the zone, and modifies an state of the object detection system and the contents of,the data storage as a function. the active zone. In one embodiment, three zones are disclosed wherein each zone represents a spheroidal area surrounding the vehicle. When the furthest zone is active, all data within the data storage is given approximately equal processing priority. When the middle zone is active, the content of the data storage is modified to prioritize data regarding the detected object for processing. Finally, when the nearest zone is active, the content of the data storage is further modified to provide highest priority to data regarding the detected object. [A2491]

"Vehicular component control systems and methods"

System and method for controlling operation of a vehicle or a component thereof based on recognition of a individual including a processor embodying a pattern recognition algorithm trained to identify whether a person is the individual by analyzing data derived from optical images and an optical receiving unit for receiving images including the person and deriving data from the images. The optical receiving unit provides the data to the algorithm to obtain an indication from the algorithm whether the person is the individual. A security system enables operation of the vehicle when the algorithm provides an indication that the person is an individual authorized to operate the vehicle and prevents operation of the vehicle when the algorithm does not provide an indication that the person is an individual authorized to operate the vehicle. A component adjustment system adjusts the component based on the recognition of the individual. [A2492]

"Weather radar system integrating ground-based weather radar with on-board aircraft weather radar"

A radar displaying system and method for use in displaying weather radar information on a cockpit display of an aircraft receives on-board weather radar information from an on-board weather radar system and ground-based weather radar information up-linked to the aircraft from a ground-based weather radar system. The information from the on-board weather radar system and the information from the ground-based weather radar system are combined to generate composite weather radar information. In response to the composite information, the cockpit display simultaneously displays both on-board weather radar imagery and ground-based weather radar imagery. [A2493]

"Methods and apparatus for stationary object detection"

The present invention provides systems and methods for measuring the likelihood that detected stationary objects are not normally present at a sensed location. Such systems and methods may be used by other systems to which information from the present invention are communicated, for minimizing nuisance alerts in onboard object detection systems such as collision warning, collision avoidance, and/or adaptive cruise control systems. The system includes at least one vehicle mounted sensor capable of sensing at least a target object and providing data related to the target object. The system also comprises a locating device which is capable of determining and providing data related to the location of the machine or vehicle and a processing unit which receives the data from the sensor and the data from the locating device. The processing unit is configured to determine a probability estimate or measure of likelihood that the target object is not a normally present object based upon a comparison to previously recorded data from a reference storage device. The reference storage device stores the previously recorded data acquired from at least one similar sensor and a vehicle locating device while operating in the same geographic area, or stores data derived from such previously recorded data. The invention may enhance vehicle collision warning, collision avoidance and/or adaptive cruise control systems as examples. [A2494]

"Device for determining distance and for transmitting data in a motor vehicle"

A device is proposed for ascertaining distance and transmitting data in a motor vehicle. It has a transmitting arrangement for generating and emitting a radar signal. A receiving arrangement receives a radar signal. It is characterized in that switchover arrangements are provided which cause the transmitting and/or receiving arrangement to operate either in a radar operating mode for detecting the distance and/or speed of a further object, or in a data-exchange operating mode for the exchange of data with a transceiver. Specific functions are enabled in dependence on the data exchange. [A2495]

"Hexagonal-annulus phased array antenna for radar wind profiling on moving platforms"

The inventive antenna uses a high-speed phased-array beam steering technique. By virtue of its geometry and the non-uniform power distribution throughout its many identical elements, the present invention achieves an ability to compensate for platform motion. The present invention also greatly reduces interference from low-angle antenna pattern sidelobes, notably ground- and sea-clutter. These are crucial characteristics for an accurate radar wind profiler. [A2496]

"A-scan ISAR target recognition system and method"

A target recognition system and method wherein only target amplitude data, i.e., coherent A-scan data, is interrogated at each of a plurality of range resolution cells along the radar line of sight path for target recognition. Target aspect angle is ignored within the angular segmentation of the feature library without degrading classification performance. Observed signature characteristics are collected at various aspect angles and through unknown roll, pitch and yaw motions of each anticipated target and provided to a neural network as training sets. The neural network forms feature vectors for each target class which are useful for valid classification comparisons in all sea states, especially in calm and littoral waters. These feature vectors are useful for valid classification comparisons over at least 30 degrees of target aspect angle. [A2497]

"Apparatus and method for detecting a location and an orientation of an underground boring tool"

An apparatus and method for determining a location and an orientation of an underground boring tool by employment of a radar-like probe and detection technique. The boring tool is provided with a device which generates a specific signature signal in response to a probe signal transmitted from above the ground. Cooperation between the probe signal transmitter at ground level and the signature signal generating device provided at the underground boring tool results in accurate detection of the boring tool location and, if desired, orientation, despite the presence of a large background signal. Precision detection of the boring tool location and orientation enables the operator to accurately locate the boring tool during operation and, if provided with a directional capacity, avoid buried obstacles such as utilities and other hazards. The signature signal produced by the boring tool may be generated either passively or actively, and may be a microwave or an acoustic signal. Further, the signature signal may be produced in a manner which differs from that used to produce the probe signal in one or more ways, including timing, frequency content, information content, or polarization. [A2498]

"Process for determining the relative velocity between two moving objects"

The invention relates to a process for determining the relative velocity in the radial direction between two moving objects, using linear frequency modulation with continuous frequency sweeps. A problem in such processes lies in being clearly able. to determine the phase difference. According to the invention, a clear determination is realized by varying the period. length for successive frequency sweeps and using the difference in period length and corresponding phase change in determining the volocity. [A2499]

"Technique for limiting the range of an object sensing system in a vehicle"

An object sensing system is capable of masking certain detected objects such that the system does not provide an alarm. Initially, a projected path of the vehicle is determined by using a current steering angle of the vehicle. Next, a desired warning distance is determined based upon the current steering angle. Then, a current distance to a sensed object, as derived from an object sensor, is determined. Finally, an alarm is provided only if the sensed object is within the desired warning distance. [A2500]

"Determination method for use with analog cellular system"

A method and apparatus for determining the location of a mobile unit within a cellular system. A synchronized signal at a common phase is generated at each base station in a system. The mobile unit transmits a signal tone. Each base station compares the phase of the signal tone to the common phase of the synchronized signal to produce a phase offset. A system controller compares the difference between the phase offset of a first base station and the phase offset of a second base station and determines the difference in distance between the first base station and the mobile unit and the second base station and said mobile unit defining a hyperbolic or linear curve of locations. The system controller compares the difference between the phase offset of the first base station and the phase offset of a third base station and determines the difference in distance between the first base station and the mobile unit and the third base station and said mobile unit defining a second hyperbolic curve of locations. The system controller determines the intersection of the first and the second hyperbolic curves thus determining the location of the mobile unit. [A2501]

"Fuzzy logic based vehicle collision avoidance warning device"

A vehicle collision avoidance warning device comprising a sensing module for detecting engine RPM, fuel throttle depress level, vehicle speed, and relative distance, a fuzzy logic controller coupled to the sensing module for receiving the engine RPM, throttle index, vehicle speed, and relative distance and generating a safety distance value using fuzzy logic, a safety warning device coupled to the fuzzy logic controller and the sensing module for comparing the distance with the safety distance and outputting a warning signal according to the comparison result. [A2502]

"Complex homodyned FSK diplex radar"

A complex frequency shift keyed homodyned diplexed radar system and method that can accurately determine the range of one or more targets where the targets have little or no velocity relative to the radar system. The system and method generates a FSK electromagnetic wave that is reflected off the one or more targets and converted into a delayed or phase shifted baseband signal and undelayed baseband signal where the delayed and an undelayed baseband signal may be analyzed to determine the range of the one or more targets. [A2503]

"Motor-vehicle-mounted radar apparatus"

A target 22 is explored by transmitting an exploration signal 40 at a certain angle while scanning an antenna 23. In the go and return exploration the angle for transmitting the exploration signal is shifted. It is possible to detect the direction of the target 22 with the same accuracy as that in exploration with a more minute angle difference, by combining the exploration results with the angle shifted in a plurality of scans. Relative travel of the target 22 that accompany a plurality of scans is considered as a Doppler shift and a combination of data is used considering the frequency shift. Data that cannot be combined is treated as an unwanted reflective object and the position where unwanted reflecting objects assemble is obtained and the position is determined as a shoulder. The height of a stationary target is determined from the variation in the reflected signal level in an approach to the stationary target. [A2504]

"Determining the condition of a concrete structure using electromagnetic signals"

Ground penetrating radar (GPR) is a technique that may be used to image the inside of a structure by collecting the echoes (or reflections) resulting from electromagnetic signals such as, for example, electromagnetic waves of typically high frequency, being radiated into the structure. Typically, the rebars inside of a reinforced concrete structure are strong radar wave reflectors. Locating deteriorated areas within a reinforced concrete structure may be accomplished by analyzing the reflections, particularly the amplitudes of the reflections, from the rebars in the reinforced concrete structure. Furthermore, the extent of deterioration of these located areas may be determined from such analysis. Significantly, the system and method described herein, when applied to determine the extent of deterioration of one or more areas of a reinforced concrete bridge deck, is effective even if a layer of asphalt is laminated to the surface of the reinforced bridge deck. A method and system for determining a condition of a substantially concrete structure is provided. One or more computer-readable data signals is received, where each data signal represents an electromagnetic signal detected from an area of the concrete structure. One or more of the detected electromagnetic signals include electromagnetic energy reflected from the concrete structure as a result of an electromagnetic signal transmitted into the concrete structure. An extent of deterioration of one or more areas of the substantially concrete structure are determined from the one or more computer-readable data signals. [A2505]

"Reversing aid"

The invention relates to a reversing aid for supporting the driver of a motor vehicle, particularly when parking, comprising at least one transmitter (12) , arranged at the rear end region (10) of the motor vehicle, for emitting measuring beams (14) into the rear danger zone, at least one receiver (16, 16a, 16b) , arranged at the rear end region (10) of the motor vehicle, for receiving beams (20) reflected at at least one detected object (18) , a distance-measuring device for determining the distance (A) between the vehicle and the detected object (18) , and a display device (22) for optically representing the distance (A) from the detected object (18) . Furthermore, the reversing aid comprises a measuring beam horizontal guidance system for the purpose of periodically scanning a predetermined angle range in the horizontal plane, an evaluation device for determining the position of the detected object in the horizontal plane relative to the vehicle rear end and to the extent of the width of the detected object, and a display screen (24) for pictorially representing the position and the extent of the width of the detected object in the horizontal plane relative to the vehicle rear end (10) . [A2506]

"Modulated pulse doppler sensor"

A range gated microwave motion sensor having adjustable minimum and maximum detection ranges with little response to close-in false alarm nuisances such as insects or vibrating panels. The sensor resolves direction of motion and can respond to target displacement in a selected direction and through a selected distance, in contrast to conventional hair-trigger motion sensors. A constant false alarm rate (CFAR) detector prevents false triggers from fluttering leaves, vibrating machinery, and RF interference. The sensor transmits an RF pulse and, after a modulated delay, mixes echo pulses with a mixer pulse. Thus, the echo pulses are modulated at the mixer output while transmit and mixer pulse artifacts remain unmodulated and easily filtered from the output. Accordingly, the sensor only responds to echoes that fall within its minimum and maximum range-gated region, and not to close-in or far-out objects. Applications for the low-cost system include indoor and outdoor burglar alarms, automotive security alarms, home and industrial automation, robotics, vehicle proximity sensors, cardiac motion detection, and a universal radar "bubble" detector. [A2507]

"Environmental location system"

A system and method for determining a location. The system employs encoded information devices dispersed through the environment, each having a non-unique code associated therewith. The codes from the encoded information devices are acquired as a reading device passes nearby, and stored. The codes from a proximate set of information devices are correlated with a map or mapping relation to determine one or more consistent positions within the environment. The information devices are preferably passive acoustic wave transponders, and the mapping relation may be a pseudorandom sequence or a defined map. [A2508]

"Narrowband passive differential tracking system (U)"

The tracking of moving vehicles over long distances without emitting illumination signals is accomplished with a narrowband passive differential tracking system. Instead of Providing especially designed radar transmitters in a bistatic radar system, illuminators of opportunity (which may include UHF and VHF television station) are selected by their geographic locations so that they are in proximity to a moving target. The Doppler-shifted target reflected signals from the illuminators of opportunity are converted into digital data and combined with the independently derived initial target location and used to update the target's position and velocity by correlating the Doppler-shift with geographic coordinates. The correlation can be accomplished with a tracking algorithm which was designed for use in data processing of the signal processing system of the narrowband passive position tracking system. [A2509]

"Multi-sweep method and system for detecting and displaying weather information on a weather radar system"

A system and method for detecting, processing, and displaying weather radar information which uses multiple scans, at differing antenna tilt angles, to generate a single displayed image. This can be used to reduce displaying of ground clutter returns and to simultaneously increase the range of weather information displayed on a single image. [A2510]

"Occupant position sensor and method and arrangement for controlling a vehicular component based on an occupant's position"

Arrangement and method in a vehicle for identifying an occupying item in which information or data about the occupying item is obtained and a pattern recognition system analyzes this information or data with respect to size, position., shape and/or motion to determine what the occupying item is whereby a distinction can be made as to whether the occupying item is human or an inanimate object. The information or data may be obtained by one or more receiver arrays which converts electromagnetic radiation into electrical signals such that the information or data about the occupying item is in the form of one or more electrical signals representative of an image of the occupying item. The same information or data may be used in arrangements and methods for controlling a vehicular component which also include a pattern recognition system for receiving and analyzing the information or data and a control unit for controlling the vehicular component based on the analysis of the information or data about the occupying item with respect to the size, position, shape and/or motion by the pattern recognition system. [A2511]

"Integrated radar and active transponder collision prediction system"

A method and apparatus for permitting a host automotive vehicle to avoid or mitigate the consequences of a collision between the host vehicle and a target automotive vehicle by using a combination of radar derived target information and transponder information. The host vehicle is equipped with a radar system operative detect the target vehicle and generate target data, and a computer which determines a likelihood of collision with target vehicle. If the likelihood of collision is above a certain level, the computer directs the radar system to transmit a directional interrogation system toward the target vehicle. The target vehicle is equipped with one or more transponders that receive the interrogation signal and respond by transmitting a response signal containing information indicating various dynamic and/or static characteristics of the target vehicle. The response signal is received by the host vehicle and is decoded to extract the target vehicle information. The computer then uses the transponder-derived target information along with the radar-derived target information to accurately determine the nature of the impending collision and direct appropriate changes in performance of one or more systems of the host vehicle in order to avoid or mitigate the consequences of the collision. [A2512]

"Volume in space locator"

Methods and apparatus for determining location information corresponding to a volume in space (VIS) that is occupied by a selected target from a remote observation platform through the process of collecting an identification signal from a source at or near the selected target and associating VIS location information data with that signal to identify location information corresponding to the VIS occupied by the target. [A2513]

"Method and apparatus for aligning a beam path for a beam-emitting sensor"

A system and method for aligning the beam path of a beam-emitting sensor arranged on a motor vehicle. Convenient and nevertheless highly precise setting of the beam direction of the beam-emitting element is possible if, when the vehicle is stationary, an external aligning beam propagating along or parallel to an actual direction of travel of the motor vehicle 1 hits a strictly planar surface on the sensor which reflects the aligning beam, the incident aligning beam and the reflected aligning beam are made to overlap as a result of the position of the sensor being changed. [A2514]

"Doppler-based traffic radar system"

A Doppler-based radar system and related method are provided for determining the direction and speed of at least one selected target traveling in the same lane as a moving patrol vehicle supporting the radar system independent of the direction of the target relative to the platform. The radar system includes an oscillator to generate a signal, an antenna to transmit the signal toward the at least one target and to receive a return signal reflected from the at least one target, a turnstile in communication with the antenna for receiving the return signal and forming processing signals which are different in phase, and circuitry for determining the direction of the at least one target relative to the platform. In particular, samples of the processing signals are transformed into the frequency domain and cross-correlated forming cross-correlation components. The radar system selects a target from the imaginary cross-correlation components dependent upon a mode of operation of the radar system and calculates the speed of the at least one target dependent upon a determined direction of the target and displays the speed for the operator's use. Advantageously, the radar system and method of operation allow the speed of the at least one target to be monitored without manual assistance from the operator. [A2515]

"Motor vehicle detector"

Vehicle detector arrangement comprising at least one detector unit (8) comprising at least one sensor (47, 48, 49, 50) , a transmission/reception unit (54) , an energy supply unit and a control unit (51, 52, 53) , whereby the energy supply unit comprises a solar cell module (3) . The transmission/reception unit (54) , the energy supply unit and the control unit (51, 52, 53) are accommodated in a housing (27, 28) and connected to the at least one detector unit (8) , whereby the solar cell module (3) is secured to the outside of the housing (27, 28) . As a result of what is thus autonomous functioning of the vehicle detector arrangement, it can be simply secured, for example, to a bridge (6) , and complicated installation jobs for power supply and data transmission, for example to a traffic routing center, are avoided. [A2516]

"Safety system for vehicles"

A safety system for a vehicle has a number of airbags (100-106) typically sited within a recess (108) in paneling of a vehicle (V) . To avert the possibility of extensive damage caused by an impact, the airbags are selectively deployed. Each airbag (100-106) has a multi-chambered structure (118-122) . The multi-chambered structure of each airbag is further arranged such that the chambers are rupturable separately from one another and are not of a vented type. More preferable, the individual chambers (118-122) are rupturable at different pressures whereby an airbag as a whole provides a cascade of energy absorbing impacts. [A2517]

"Method and apparatus for the highly accurate determination of the filling level of a product in a container"

The invention relates to a method for the highly accurate determination of the filling level (q) of a product (4) in a container (2) , measuring signals being transmitted in the direction of the surface (5) of the filled product (4) and reflected at the surface (5) as echo signals and the filling level (q) in the container (2) being determined by evaluation of the amplitude values (A) and phase values (.psi.) of the reflected echo signals by means of a pulse delay-time method. Furthermore, an apparatus suitable for carrying out the method is proposed. The invention is based on the object of proposing a method and an apparatus which permit highly accurate filling level measurements in containers (2) , even if multipath propagation or multimode propagation occurs. The object is achieved by compensating for errors which occur in the determination of the filling level (q) and are caused by interference signals which interfere constructively or destructively with the echo signals reflected regularly at the surface (5) of the filled product (4) . [A2518]

"Interruption-free hand-held positioning method and system thereof"

An interruption-free hand-held positioning method and system, carried by a person, includes an inertial measurement unit, a north finder, a velocity producer, a positioning assistant, a navigation processor, a wireless communication device, and a display device and map database. Output signals of the inertial measurement unit, the velocity producer, the positioning assistant, and the north finder are processed to obtain highly accurate position measurements of the person. The user's position information can be exchanged with other users through the wireless communication device, and the location and surrounding information can be displayed on the display device by accessing a map database with the person position information. [A2519]

"Vehicle navigational system and signal processing method for said navigational system"

The invention relates to a vehicle navigational system with a radar arrangement and an image sensor arrangement. It is proposed to derive target parameters separately from the receiving signals of the two arrangements and to convey them to data merging means to link the separately derived parameters. Linking can be carried out at different levels of digital signal processing. [A2520]

"Method of detecting fault of radar apparatus using movement distance and radar apparatus for the same"

A radar apparatus mounted on a vehicle includes a detecting section and a fault determining section. The detecting section includes a radar unit and detects a detection object using radar wave radiated from a radar unit toward the detection object and reflected radar wave from the detection target to the radar unit. The fault determining section determines whether any fault has occurred in the radar unit, based on the detecting result of the detection object and a movement distance of the vehicle, and generates a fault detection signal, when it is determined that any fault has occurred in the radar unit. [A2521]

"Radar system mounted on vehicle and capable of detecting degradation of sensitivity"

A radar system mounted on a vehicle includes a radar apparatus, a radome provided for the radar apparatus, a front wiper, a wiper operation detector detecting an operation of the front wiper, a temperature detector detecting temperature outside of the vehicle, and a processing unit. The processing unit estimates whether sensitivity degradation of the radar apparatus is caused, based on the detecting result of the wiper operation detector and the detecting result of the temperature detector. [A2522]

"Method and system for detecting a child seat"

Method and system for detecting the presence of the child seat on the seat including a receiving unit for receiving waves from a space above the seat and a signal-generating component which generates a signal based on the received waves which is indicative of the occupancy of the space above the seat. A different signal is generated for different occupants of the seat when the seat is occupied. A signal from the receiving unit representative of the received waves is analyzed, e.g., by a processor applying pattern recognition techniques, in order to generate the signal indicative of the occupancy of the seat and thereby enable a determination of whether a child seat is present in the seat and optionally the orientation thereof. A wave-emitter may be provided for emitting waves, e.g., ultrasonic or electromagnetic waves, into the space above the seat. One or more other systems or components in the vehicle, e.g., an occupant restraint device, may be affected or controlled based on the signal indicative of the occupancy of the seat, and more particularly, the determination of whether a child seat is present on the seat. [A2523]

"Reduced throughput track data association using look-up tables"

A system for rapidly associating a set of tracks with a set of sensor observations. Look-up tables are formed, with each look-up table being associated with a portion of a geometric surface surrounding the sensor so that the table cells correspond to various directions in free space in which sensor observations may be made. On the edges of each look-up table are overlap boundary rows of cells which contain the same sensor data as cells of the adjacent table. The observations from a sensor are populated into the tables based upon the directional orientation of the observations. Predicted values are calculated for each target object data track, and groups of cells surrounding the predicted values are searched for sensor observation data to match with each track. Having overlap boundary rows for each table which contain redundant data from the edge of the adjacent table allows the search for sensor data to match with a track to be performed within a single table. [A2524]

"Electromagnetic sensor system"

A vehicle (160) such as a motor road vehicle is fitted with an electromagnetic sensor system comprising transmitting means (e.g. 4, 1) for transmitting a radio frequency signal, receiving means (e.g. 2, 6) for receiving reflections of said signal from remote objects, sampling means (20, 28) operable to sample the received reflected signal (or a signal derived therefrom) , and processing means (e.g. 36) for processing the sampled signal, and operable to detect said reflections in the sampled signal, and to determine information on the presence, position and/or range of said object. The system includes filter means (e.g. 34) for preventing radio signals transmitted by other sources or noise spikes from causing interference which results in spurious detections or indications of range by the processing means. [A2525]

"Obstacle detecting system"

The accuracy of determination of a possibility of collision of a vehicle with an object is enhanced without the shortening of a period for detection of the object by an object detecting apparatus. A collision-possibility determining device determines the presence or absence of a possibility of collision of the vehicle with the obstacle by comparing a future locus of movement of the obstacle determined by an obstacle locus determining device based on an output from a radar device, with a future locus of movement of the vehicle determined by a vehicle locus determining apparatus based on outputs from wheel speed sensors and a yaw rate sensor. The period of the detection conducted by the radar device providing data about the obstacle to the obstacle locus determining apparatus is 100 msec, but the obstacle locus determining apparatus, the vehicle locus determining apparatus and the collision-possibility determining apparatus carry out the determination of the possibility of collision at a determination period shorter than the detection period of 100 msec. Thus, it is possible to carry out the determination of the possibility of collision at the shorter determination period without use of a large-sized and expensive radar device, thereby enhancing the determination accuracy. [A2526]

"Method and apparatus for predicting lightning threats based on radar and temperature data"

The invention provides a system and method for predicting areas where lightning strikes are likely to occur by evaluating radar and temperature data. Radar volume data is analyzed to locate cloud tops that extend above a height corresponding to a temperature line of about -10.degree. C. Areas where cloud tops extend above the height of the -10.degree. C. line and that have a radar composite reflectivity greater than 30 dBZ are designated as probable lightning threat areas. Radar movement is tracked across at least two time periods, and a correlation algorithm predicts the future location of lightning threat areas at predetermined time periods (e.g., 10 minutes, 20 minutes, and 30 minutes) based on predicted radar values. A computer display shows the predicted location of the lightning threat areas for the future time periods. In one variation, selected structures or areas (e.g., power lines, factories, or the like) are superimposed on a computer display with predicted lightning threat areas to illustrate where lightning damage is likely to occur. [A2527]

"Accident avoidance system"

System and method for preventing vehicle accidents in which GPS ranging signals relating to a host vehicle's position on a roadway on a surface of the earth are received on a first communication link from a network of satellites and DGPS auxiliary range correction signals for correcting propagation delay errors in the GPS ranging signals are received on a second communication link from a station or satellite. The host vehicle's position on a roadway on a surface of the earth is determined from the GPS, DGPS, and accurate map database signals with centimeter accuracy and communicated to other vehicles. The host vehicle receives position information from other vehicles and determines whether any other vehicle from which position information is received represents a collision threat to the host vehicle based on the position of the other vehicle relative to the roadway and the host vehicle. If so, a warning or vehicle control signal response to control the host vehicle's motion is generated to prevent a collision with the other vehicle. [A2528]

"Surveillance device for signal-echo sensors"

The signal echo monitoring device includes a transmitting unit (5) for broadcasting a transmitted signal (s (t)) which is a group of randomly generated pulses, a receiving unit (6) for receiving an echo signal (e (t)) , reflected by an object (12) , of the transmitted signal and a combined control and evaluation unit (2) including a device (10) for jointly evaluating the transmitted signal (s (t)) and the echo signal (e (t)) with an integrated adaptive filter (14) . The adaptive filter (14) automatically calibrates its impulse response b (t) and may be a digital filter. [A2529]

"Method and system for tracking multiple regional objects by multi-dimensional relaxation"

A method and system for real-time tracking of objects are disclosed. A region is repeatedly scanned providing a plurality of images or data sets having points corresponding to objects in the region to be tracked. Given a previously determined track for each object in the region, an M-dimensional combinatorial optimization assignment problem is formulated using the points from M-1 of the images or data sets, wherein each point is preferably used in extending at most one track. The M-dimensional problem is subsequently solved for an optimal or near-optimal assignment of the points to the tracks, extending the tracking of the objects so that a response to each object can be initiated by the system in real-time. Speed and accuracy is provided by an iterative Lagrangian Relaxation technique wherein a plurality of constraint dimensions are relaxed simultaneously to yield a reduced dimensional optimization problem whose solution is used to formulate an assignment problem of dimensionality less than M. The iterative reducing of dimensions terminates when exact solutions are determined for two-dimensional cases. A recovery procedure is used for determining a higher dimensional assignment problem solution from a problem having one less dimension. The procedure is useful when the reduced dimensional optimizational problem has two constraint dimensions. [A2530]

"Discrimination of detected objects in a vehicle path"

An object sensing system is capable of distinguishing an overhead roadway object, that is not in a host vehicle path, from a substantially motionless roadway object that is in the vehicle path. Initially, a plurality of sensor scan signals are provided into an anticipated path of a host vehicle. Next, a plurality of object return signals that correspond to reflections of the plurality of sensor scan signals from at least one detected stationary object are received. Then, an average amplitude slope of the return signals as a function of the range to the at least one detected stationary object is determined. A sufficiently positive amplitude slope identifies the detected stationary object as an overhead roadway object that is not in the vehicle path. A sufficiently negative amplitude slope identifies the detected stationary object as a substantially motionless roadway object that is in the vehicle path. [A2531]

"Automatic headlamp control system utilizing radar and an optical sensor"

A headlamp control system for a motor vehicle includes a wave transmitting and wave receiving device for detecting objects. The headlamp control system determines the state of the vehicle headlamps based upon objects detected by the wave transmitting and wave receiving device. The wave transmitting and wave receiving device can be a radar, an optical radar, ultrasonic, or the like. An optical sensor can be used to detect ambient light or other vehicles. [A2532]

"System and method for projecting storms using NEXRAD attributes"

The subject invention provides an improved system and method for combining data obtained from the NEXRAD.TM. system of the National Weather Service ("NWS") with geographical and topological database information to achieve an improved and informative graphical storm-tracking display able to project the movement of a storm with a single user-operation. The method of projecting storm movement includes the following steps: collecting NEXRAD data attributes from a weather data source, calculating storm position using the collected NEXRAD attributes, calculating projected storm movement using the storm position and the collected NEXRAD attributes, displaying a graphic representation of the projected storm movement. [A2533]

"Spread spectrum localizers"

A network of localizers determines relative locations in three-dimensional space to within 1 cm by measuring propagation times of pseudorandom sequences of electromagnetic impulses. The propagation time is determined from a correlator which provides an analog pseudo-autocorrelation function sampled at discrete time bins. The correlator has a number of integrators, each integrator providing a signal proportional to the time integral of the product of the expected pulse sequence delayed by one of the discrete time bins, and the non-delayed received antenna signal. Using pattern recognition the arrival time of the received signal can be determined to within a time much smaller than the separation between bins. Because operation of standard CMOS circuitry generates noise over a large frequency range, only low-noise circuitry operates during transmission and reception. A stage in the low-frequency clock uses low-noise circuitry during transmissions and receptions, and standard circuitry at other times. [A2534]

"Doppler-based traffic radar system and related method of operation without detection"

A Doppler-based traffic radar system determines a speed of a moving target from a platform while substantially eliminating the possibility of detection by an operator of the moving target utilizing a traffic radar detector. The radar system limits a period of time the system is initially transmitting. The radar system is adapted to determine the speed of the target and display the speed. Dependent upon the displayed rate of speed, the radar system operator further has the ability to halt operation of the radar system with respect to the particular target or to reinitiate transmission of the transmit signal for subsequently tracking the speed of the moving target. [A2535]

"System and method for intrusion detection using a time domain radar array"

A system and method for highly selective intrusion detection using a sparse array of time modulated ultra wideband (TM-UWB) radars. Two or more TM-UWB radars are arranged in a sparse array around the perimeter of a building. Each TM-UWB radar transmits ultra wideband pulses that illuminate the building and the surrounding area. Signal return data is processed to determine, among other things, whether an alarm condition has been triggered. High resolution radar images are formed that give an accurate picture of the inside of the building and the surrounding area. This image is used to detect motion in a highly selective manner and to track moving objects within the building and the surrounding area. Motion can be distinguished based on criteria appropriate to the environment in which the intrusion detection system operates. [A2536]

"CDMA communications and geolocation system and method"

A spread-spectrum CDMA communications system for locating remote units, and for communicating message data between a plurality of remote units and a base station. The spread-spectrum CDMA communications system includes a plurality of base stations and a plurality of remote units. A base station has a spread-spectrum modulator for spread-spectrum processing the message data, and a transmitter for transmitting the spread-spectrum processed-message data, combined with a generic-chip-code signal, from the base station to a remote unit. The base station also has an antenna, and spread-spectrum detectors for recovering message-data communicated from the remote units. A remote unit has an antenna, and a detector coupled to the antenna for recovering data communicated from the base station. The detector includes a spread spectrum demodulator. Also, the remote unit has a device for converting the format of the data into a form suitable for communicating over radio waves, a spread spectrum modulator and a transmitter. The base station has a range circuit, which compares the generic-chip-code signal generated at the base station with the generic-chip-code signal received from the remote unit, for determining a range between the remote unit and the base station. [A2537]

"System and method for locating radio frequency identification tags using three-phase antenna"

A system and method for determining the position of a radio frequency identification (RFID) transponder with respect to a sensor. In one embodiment, the system comprises a plurality of stationary sensors located in an array within certain physical areas. Each sensor comprises a plurality of antenna coils arranged in unique physical orientations and capable of transmitting radio frequency signals of differing phase. The RFID transponder includes an antenna which receives the plurality of signals generated by the antenna coils, and compares the phase of at least two of the signals to determine the relative position of the transponder. In a second aspect of the invention, the aforementioned antenna coils emit two direction finding mode (DFM) signals in succession, the first signal with all antenna coils turned on, the second with one of the coils turned off. The spatial relationship of the transponder antenna and individual antenna coils precludes all of the signals in each sensor from being rejected by the transponder during emission of both the first and second DFM signal. Hence, the transponder is kept in constant communication with the sensor in all orientations. In another embodiment, the location of the transponder with respect to two or more sensor (s) is determined through measurement of the intensity of the signals received by the antenna coil of the transponder. The invention also includes a system and method for transmitting data between a sensor and a dormant (motionless) RFID transponder using a hand-held high intensity RF probe. [A2538]

"Method for determining the vertical distance between an object and a device with a variable position"

The invention relates to a method for determining the perpendicular distance between an object and a device whose position varies, in particular a motor vehicle, in the case of which device a first sensor which is arranged on this device emits a signal which is reflected by the object, and this reflected signal is received by this first sensor, in which case the delay time of the signal from transmission to reception is used by the first sensor to determine the distance between the first sensor and the object. In order to determine the perpendicular distance to the object, this distance is used to determine all the possible positions of the object with respect to the first sensor, the signal reflected by the object is furthermore received by a second sensor, which is likewise arranged on the device whose position varies, and the delay time of the signal from the first sensor to the second sensor is used to determine a path from the first sensor to the object and from this object to the second sensor, from which path all the possible positions of the object with respect to the second sensor are determined, the positions determined by the first sensor and the second sensor with the same distance are then compared with one another, and the perpendicular distance to the device whose position varies is determined for those positions of the object which are detected by both the first sensor and the second sensor. [A2539]

"Talking buried object detector"

A spoken word-producing detector identifies objects by comparing signatures of detected objects with stored signatures of known objects. When the signatures compare, the detector produces stored word sounds associated with the detected object identifications. An annunciator produces the words from pre-digitized human voice sounds. A screen displays the words. [A2540]

"Method and system for controlling a vehicular system based on occupancy of the vehicle"

A vehicle interior monitoring system to identify, locate and/or monitor occupants, including their parts, and other objects in the passenger compartment in which waves are transmitted into a space in the passenger compartment in which an occupying item might be situated and a receiver receives waves modified by passing through the space in the passenger compartment in which the occupying item might be situated. Outputs from the receiver are used to affect another system in the vehicle. Also, the outputs may be analyzed, e.g., by computational means employing pattern recognition technologies, to classify, identify and/or locate the contents. In general, the information obtained by the identification and monitoring system is used to affect the operation of some other system in the vehicle. When the system is installed in the passenger compartment of an automotive vehicle equipped with an airbag, the system determines the position of the vehicle occupant relative to the airbag and, e.g., disables deployment of the airbag if the occupant is positioned so that he/she is likely to be injured by the deployment of the airbag. [A2541]

"Car radar testing"

A method and device for testing the function of a radar. A diode (21) with variable radar radiation impedance is arranged in the beam path (23) inside the antenna unit (4, 6) of the car radar and is fed with alternating current for simulating a radar target at a distance from the antenna unit. The obtained target data for the simulated target are compared to the expected target data for testing the function. [A2542]

"Broadband CDMA overlay system and method"

A spread-spectrum CDMA communications system for communicating data between a plurality of users to a plurality of spread-spectrum units. The spread-spectrum communications system is located within a same geographical region as occupied by an existing FDMA, proposed TDMA or any other mobile-cellular system. The spread-spectrum CDMA communications system includes a plurality of spread-spectrum-base stations and a plurality of spread-spectrum units. A spread-spectrum-base station has a comb filter for notch filtering predetermined channels of the mobile-cellular system, a device for converting the format of the data into a form for communicating over radio waves, a spread-spectrum modulator for spread-spectrum processing the data, and a transmitter for transmitting the spread-spectrum-processed converted data from the spread-spectrum-base station to a spread-spectrum unit. The spread-spectrum-base station also has an antenna, and spread-spectrum detectors for recovering data communicated from the spread-spectrum units. A spread-spectrum unit has an antenna, and a detector, including a spread-spectrum demodulator, coupled to the antenna for recovering data communicated from the spread-spectrum-base station, and the spread-spectrum unit has a spread-spectrum modulator, a transmitter, and a device for converting the format of the data for communicating over radio waves. [A2543]

"Method and system for detecting turbulence with reduced errors resulting from vertical shear components"

A system and method for enhancing turbulence detection, display and alerting with avionics weather radars which includes automatically making multiple scans, measuring a wind velocity gradient at varying elevations, and comparing the measured gradient to known predetermined wind velocity gradients over known elevation variations, wherein the predetermined gradients have known vertical shear components, and using a vertical shear component information in making determinations regarding the existence of turbulence. [A2544]

"Multi-sweep method and system for mapping terrain with a weather radar system"

A system and method for detecting, processing, and displaying ground mapping radar information which uses multiple scans, at differing automated antenna tilt angles, to generate a single displayed image. This can be used to increase the scanned area of a ground display so as to allow a complete sampling of the ground ahead of the aircraft. [A2545]

"Automobile unsafe following distance warning system"

An automobile unsafe following distance warning system, located in an installed vehicle, for assessing whether a safe following distance is present between the installed vehicle and a front vehicle which is traveling immediately in front of the installed vehicle, comprising a sensor unit for determining the distance between the front vehicle and the installed vehicle, and for determining the speed of the installed vehicle. A threshold safe following distance is determined from the measured speed of the installed vehicle. An initial warning light is illuminated to notify the driver that the actual following distance is less than the threshold safe following distance. A severe warning light, a buzzer, and a vibration unit are activated to notify the driver that the actual following distance is much less than the threshold following distance and that a dangerous situation exists. [A2546]

"Surface acoustic wave transponder configuration"

An acoustic wave identification transponder device, having a substrate, an electroacoustic transducer generating an acoustic wave in said substrate and a set of encoding elements disposed in a path of the acoustic wave for modifying the acoustic wave, having elements which reflect portions of the acoustic wave having a component orthogonal to the incident wave. The reflectors may be, for example, trackchangers or reflective arrays compressors (RAC) . The wave may be phase-amplitude modulated for increased efficiency expressed in bits per tap. Such phase amplitude modulation is preferably imposed by partial beam width phase delay elements disposed within an acoustic beam path. [A2547]

"Spread spectrum localizers"

A network of localizers determines relative locations in three-dimensional space to within 1 cm by cooperatively measuring propagation times of pseudorandom sequences of electromagnetic impulses. Ranging transmissions may include encoded digital information to increase accuracy. The propagation time is determined from a correlator circuit which provides an analog pseudo-autocorrelation function sampled at discrete time bins. The correlator has a number of integrators, each integrator providing a signal proportional to the time integral of the product of the expected pulse sequence delayed by one of the discrete time bins, and the non-delayed received antenna signal. With the impulses organized as doublets the sampled correlator output can vary considerably in shape depending on where the autocorrelation function peak falls in relation to the nearest bin. Using pattern recognition the time of arrival of the received signal can be determined to within a time much smaller than the separation between bins. Because operation of standard CMOS circuitry generates noise over a large frequency range, only low-noise circuitry operates during transmission and reception. To provide the time accuracy necessary for distancing, a high-frequency clock operates during inter-localizer communications. The high-frequency clock uses a phase-lock loop circuit to increase the clock rate and a programmable delay to provide still finer time graduations. A stage in the low-frequency clock uses low-noise circuitry during transmissions and receptions, and standard circuitry at other times. [A2548]

"FM pulse Doppler radar apparatus"

AN FM pulse Doppler radar apparatus performs pulse modulation of modulating waves having repeatedly increasing and decreasing frequency, transmits thus modulated waves, receives at each range gate having an interval equivalent to a pulse width, reflected waves reflected from an object, determines a distance according to the range gate, and calculates the distance to the object and the relative velocity of the object based on the difference between frequencies of the transmission waves and the received waves. The apparatus includes a velocity determining unit for determining velocity of the radar-mounted vehicle and a comparison-and-detection unit for comparing the detected distance according to the range gate and the distance calculated based on the difference between the frequencies of the transmission waves and the received waves. The comparison-and-detection unit detects, based on the velocity of the vehicle and the relative velocity between the vehicle and the object, a distance error due to an error in transmission frequency bandwidth. [A2549]

"Method of reducing clutter and mutual interference in a coherent doppler radar system"

A method is proposed for use on a coherent Doppler radar system for the purpose of reducing the clutter and mutual interference in the coherent Doppler radar system. The echoed radar signal from the target object is converted into a Range-Doppler Domain output signal. If the Range-Doppler Domain output signal indicates the presence of mutual interference, a Crisscrossing CFAR method is selected to compute for the CFAR back-ground value, otherwise an Area CFAR method is selected. A target-detection logic circuit is then used to obtain the radar information about the target object. By the proposed method, the output signal of the target-detection logic circuit is substantially free from clutter and mutual interference, which is further converted into a radar display signal to drive a radar display unit to display the location and velocity of the target object. [A2550]

"Obstacle recognition system for vehicle"

Height-wise positions of objects are detected on the basis of distances to the objects from a vehicle, angles of the objects in a width-wise direction of the vehicle, and angles of the objects in a height-wise direction of the vehicle. A plurality of objects, which satisfy conditions predetermined depending on physical characteristics of delineators, are determined to be objects composing a delineator group. When the detected height-wise position of an object in the delineator group which is nearest to the vehicle corresponds to a predetermined value or less, the delineator group is determined to be a delineator group on a road surface. A determination is made as to whether each object in the on-road-surface delineator group is a non-delineator in response to conditions of the detected height-wise positions of the objects in the on-road-surface delineator group. [A2551]

"Radar apparatus"

A radar apparatus is provided that can correctly extract the necessary point for a determination related to the safe travel of one's automotive vehicle among objects such as automotive vehicles moving at an angle in front and constructed objects. The radar apparatus of the present invention provides antennas that transmit beams in a plurality of directions and receive the reflected waves from objects as received signals. The objects that generated these reflected waves are detected. In addition, this radar apparatus provides a reflected location detection device that detects the reflected locations that are the generation source of the reflected waves for this plurality of directions, a grouping device that groups each of these detected reflected locations into a group of single or plural reflected locations assuming they belong to the same object, and a device that extracts reflected locations having the shortest distance from the moving body from among these grouped reflected locations to serve as reference points related to the safe travel of this moving body. [A2552]

"High performance vehicle radar system"

A radar system is described for use in vehicular applications. The radar system is particularly suited to backup warning systems and side-object warning systems. The radar minimizes many of the problems found in the prior art by providing programmable delays and programmable gain. The radar uses a range search algorithm to detect and sort targets at various ranges within the field of view of the radar. Each target range corresponds to a particular delay and gain setting. The radar searches for targets at the various ranges by running a target search algorithm. for each target range, the search algorithm causes the proper time delay and gain setting. Targets within the selected range are detected and catalogued. A display is used to warn the driver of the vehicle of the presence of targets at the various ranges. The warning may be visual and/or audible. [A2553]

"Apparatus and method for microwave imaging and excavation of objects"

A microwave imaging excavator for the detection, imaging and excavation of objects on or buried beneath the surface of the ground, such as metallic and dielectric land mines. A continuous wave stepped frequency ground penetrating radar signal is transmitted into the ground from a waveguide antenna mounted in one spade of a double spade auger. Direct breakthrough energy, signals reflected from the surface and the buried objects are received by an identical waveguide antenna mounted in the opposite spade. The spectra reflected from different buried objects become more distinct when the spectrum radiated spans the natural electromagnetic resonance of those objects. These signals are recorded as the twin-spaded auger is mechanically scanned over the ground in two mechanical rotational states of polarization. When the auger spades are on either side of a buried mine they are closed to grasp the mine which is then removed from the ground. [A2554]

"Method and device for classifying overhead objects"

The present invention relates to a method for classifying objects detected by a vehicle mounted radar located in front of said vehicle for transmitting a radar microwave signal and for receiving reflexes thereof from objects positioned in front of said vehicle, said melted comprising the steps of: tracking a radar reflex from an object located in front of said vehicle as the calculated distance from said vehicle to said object, as derived based upon the time of flight of said radar reflex, decreases, monitoring changes in the amplitude of said radar reflex from said object is said calculated distance from said vehicle to said object decreases, and classifying said object as an overhead object or a ground level object based upon the said changes in the radar reflex amplitude. [A2555]

"Radar and method therefor"

A radar (300) comprises a transceiver (302) for transmitting pulses directed to a subsurface area of interest (102) and for receiving a reflected wave (210) from the subsurface area of interest. The pulses have a pulse duration and amplitude constrained by the equation, d.sup.2.vertline.E.vertline.e/m.ltoreq.1 Angstrom, where d is the pulse duration in seconds, E is the pulse amplitude in volts/meter, e equals the charge of an electron in Coulombs, and m equals the mass of an electron in Kg. A processing device (304) , in communication with the transceiver, processes the reflected wave and displays an image of the subsurface area of interest and identifies the material composition of subsurface objects that have known properties that vary as a function of the pulse duration and amplitude. [A2556]

"Method of manufacturing an enclosed transceiver"

The present invention teaches a method of manufacturing an enclosed transceiver, such as a radio frequency identification ("RFID") tag. Structurally, in one embodiment, the tag comprises an integrated circuit (IC) chip, and an RF antenna mounted on a thin film substrate powered by a thin film battery. A variety of antenna geometries are compatible with the above tag construction. These include monopole antennas, dipole antennas, dual dipole antennas, a combination of dipole and loop antennas. Further, in another embodiment, the antennas are positioned either within the plane of the thin film battery or superjacent to the thin film battery. [A2557]

"Underground storage tank monitoring system and method"

An underground storage tank monitoring system and method uses special micropower impulse radar probes, with one such probe being inserted into each storage tank. The micropower impulse radar probes use flexible waveguides which extend downward to the tank bottom such that micropower radar impulses travel to and from the liquid surface via a wave guide, with the lapse between emission and reception of the impulse indicating a distance from the probe, and thus a liquid level. Each micropower impulse radar probe is connected to a dedicated spread spectrum transmitter which collects level and status information from the probe, encodes and transmits it to a matching spread spectrum receiver nearby. The receiver converts the coded signals into electrical signals and forwards them to a processor, a modem and a back-up battery are located. The processor stores the liquid level information for later transmission, along with liquid dispensed and liquid replaced information, to a central monitoring site via the modem. [A2558]

"Distance detecting method and its apparatus"

A signal having periodicity is transmitted to a communication station B based on a reference timing generated by a timer which a communication station A has, while the communication station B, which has received a transmitting signal of the communication station A, receives a signal generated based on a reference timing generated in its internal section and transmitted, and a phase difference between the transmitting signal and the received signal is detected so as to detect a distance between the communication station A and the communication station B. [A2559]

"Accident avoidance system"

System and method for preventing vehicle accidents in which the absolute position of the vehicle is determined, e.g., using a satellite-based positioning system such as GPS, and the location of the vehicle relative to the edges of the roadway is then determined based on the absolute position of the vehicle and stored data relating to edges of roadways on which the vehicle may travel. A system or component within the vehicle is initiated, e.g., an alarm or warning system, or the operation of a system or component is affected, e.g., an automatic guidance system, if the location of the vehicle approaches close to an edge of the roadway or intersects with an edge of the roadway. [A2560]

"Vehicle surroundings monitoring apparatus"

Distance image outputted from an image processor is read by a recognition/judgment computer, in which the distance image is divided into strips having a specified interval and a histogram is prepared for each strip. Based on the histogram, the position of solid objects and the distance thereto are obtained and these positional data of the solid objects are classified into groups of solid object and groups of side wall. Further, the position of a wall surface forming a boundary of a road is detected from the data of the groups of side wall. On the other hand, assuming a wall surface model composed of a series of nodes, respective nodes are determined and corrected by the data of side wall. Thus obtained nodes form a successive wall surface along a curved road. [A2561]

"Reflector circuit"

A reflector circuit is provided which responds to illuminating radiation with corresponding output radiation of increased magnitude relative to the illuminating radiation. The circuit comprises an antenna for receiving the illuminating radiation and emitting corresponding output radiation, a delay line providing a frequency selective limiting and signal storage characteristic and an amplifier assembly incorporating a reflection amplifier for providing signal amplification. The reflection amplifier is capable of providing high gains approaching +30 dB at relatively low current consumption, for example, tens of microamperes. The antenna provides an input signal upon receipt of the illuminating radiation, a portion of which is amplified, frequency selectively filtered, and then stored for a period after which it is emitted as the output radiation from the circuit. Switches may be incorporated and are operable to counteract spontaneous oscillation within the circuit. [A2562]

"On-vehicle DBF radar apparatus"

An on-vehicle DBF radar apparatus is mounted on a vehicle and is arranged to detect an object around the vehicle by scanning with radar beams synthesized by digital signal processing. The radar apparatus has a lane shape acquiring section for acquiring a shape of a lane on which the vehicle is driving. In the radar apparatus a scanning range of the radar beams is limited according to the shape of the lane acquired by the lane shape acquiring section. The radar apparatus has advantages of high detection rate and detection accuracy. [A2563]

"Following distance alarming apparatus and following distance displaying apparatus that display difference between measured following distance and that at which warning is given"

A following distance displaying apparatus which enables visual confirmation how much more approach between a preceding vehicle and a subject vehicle makes a distance at which an alarm of a following distance alarming apparatus operates, after a lapse of a predetermined time from when the preceding vehicle and the subject vehicle entered a follow-up travel state, indicates an alarm distance at which the alarm of the following distance alarming apparatus operates which is set in advance corresponding to the then following distance to the preceding vehicle and an approach distance representing a difference between the subsequently measured following distance and said alarm distance. [A2564]

"Radar system for motor vehicle"

An automotive radar system having an oscillator is described, the oscillator generating a high-frequency signal only in intervals as a function of a control signal during operation of the radar system. The oscillator includes a microwave diode, in particular a Gunn diode or an Impatt diode, accommodated inside a casing-like body. At least one of the following components, an ohmic resistor, a transistor or an IC is arranged so that it is thermally connected to the casing-like body or to an element thermally connected to the latter, the component having at least one additional function in the circuit configuration of the radar system other than generating heat. This guarantees that the oscillator will oscillate reliably even at very low temperatures and in particular in chopping operation. [A2565]

"Vehicular radar"

A vehicular radar includes a transmitter for outputting a transmitted electromagnetic wave, an antenna unit for radiating the transmitted electromagnetic wave and receiving a electromagnetic wave reflected by an object to be detected as a received electromagnetic wave, a receiver for detecting the reflected electromagnetic wave received by the antenna unit, and a signal processor for processing an output signal from the receiver to output information about the object. The antenna unit includes a single electromagnetic radiator for radiating the transmitted electromagnetic wave, a single reflector for reflecting the transmitted electromagnetic wave from the electromagnetic radiator and radiating the transmitted electromagnetic wave as a beam, and a reflector swinging device for swinging the reflector so as to successively change a direction of the beam. The reflector swinging device includes a first arm, a second arm, a swinging pivot, a cam and a cam follower. [A2566]

"Method and sensor for detecting foreign bodies in a medium with a radar"

A method of detecting foreign bodies in a medium with a radar having a transceiver, and including emitting a radar wave through a wall surface into the medium with the transceiver, detecting a radar signal reflected in the medium, pre-processing the reflected radar signal and subjecting the pre-processed radar signal to evaluation and assessment, determining a characteristic of a foreign body at a stationary position of the transceiver with an algorithm which is based on a pre-processed, digitalized receivable signal, which characteristic permits to recognize differences between a shape of the reflected radar signal and stored comparison values, and conducting a comparison assessment of the shape differences of the reflected signal against predetermined threshold values. [A2567]

"Method and a system for monitoring plurality of movable objects"

A method and a system for monitoring a plurality of movable objects, wherein each of the objects is equipped with a transponder with which a stationary node is arranged to communicate. Each transponder is caused to reply to a unique signal from the node and each transponder that sends a response signal gives to the response signal a transponder identification addition. A node is caused to detect the speed and direction at which each transponder moves towards and away from the node. Movement of the transponder relative to the node is evaluated by node associated means on the basis of the speed and direction of the transponder. A register over those transponders with which the node shall communicate is set-up for each node. A plurality of separate nodes are provided and each node is provided with such a register. The nodes are arranged to communicate with one another, so as to enable a node to record in its monitoring register a transponder from another node. [A2568]

"Method and device for adjusting a distance sensor"

The present invention relates to a method and an apparatus for adjusting the alignment of a beam characteristic of a distance sensor, in particular of a proximity radar for a motor vehicle. An apparatus for positioning a motor vehicle, preferably a headlight aiming device, is joined to the target object for the distance sensor. Also provided is a service unit with which measured values or data of the distance sensor can be read out. On the basis of at least one predefined criterion, the measured values or data are analyzed in such a way that necessary displacement directions of the distance sensor can be displayed by way of the service unit. Preferably the capability of the distance sensor to determine angular positions of detected target objects is utilized. Otherwise adjustment is performed to predefined reception levels. [A2569]

"Method and apparatus for detecting an object on a side of or backwards of a vehicle"

A method and apparatus are described for detecting obstacles in the "blind spot" of a motor vehicle's side mounted mirrors. Advantageously, the inventive apparatus is mounted on the vehicle as an attachment to the side mirror system or adjacent to it. The invention determines the presence of an obstacle in a sensing volume that encompasses the "blind spot". The invention relies on the time-of-flight measurement of preferably short infrared pulses to locate obstacles. Multiple sensors are used to provide area coverage. If any sensor detects an obstacle within its predefined range limits then an indication is provided by a display unit at the side mirror location. The system can be used on both sides of the vehicle and each side operates independently. [A2570]

"Precision all-weather target location system"

An apparatus to determine the three-dimensional location of an airborne platform relative to a target area using two separate antenna assemblies positioned on the airborne platform. The first antenna assembly is adapted to transmit energy downward toward a surface location directly beneath the airborne platform, while the second antenna assembly is adapted to transmit energy forward towards the target area remote from the surface location. A single transmitter is associated with both of the antenna assemblies for transmitting signals toward the surface location and the target area. A receiver coupled to the antenna assemblies receives and detects the signals corresponding to the transmitted energy as reflected by the target area and the surface location. A radar processor is coupled to the receiver and is adapted to determine the range between the airborne platform and the surface location and determine the three-dimensional height of the target area from the detected signals. The radar processor also extracts two-dimensional gray scale imagery of the target area from the detected signals. The apparatus also incorporates three geolocated stored references, one of terrain heights of the surface location and target area, one of the intensity image of the surface location, and the third of two-dimensional gray scale imagery of the target area. A height correlator compares the elevation measurements produced by the both the downward and forward looking platform sensors to the stored reference of terrain heights. The intensity of the radar return is also matched with a stored reference of intensities of the surface area. An image correlator for matching the extracted gray scale imagery of the target area to the stored reference of gray scale imagery is provided. A navigational processor then determines the three-dimensional location of the platform relative to the target area based on the correlation results of the height correlator and the image correlator. [A2571]

"Method for determining range of vision"

A method via which the range of vision in a vehicle's field of view can be determined precisely, so that with the help of range-of-vision information the driver can be advised to modify his driving style. The contrast of an object detected by a radar or lidar sensor is measured by a monocular video sensor, and the range of vision is determined from the measured values supplied by the radar or lidar sensor and by the monocular video sensor. Alternatively, the distance to and contrast of at least one object can be measured by a binocular video sensor, the range of vision then being determined from the measured contrast and distance values. [A2572]

"Device with a nonradiative dielectric waveguide with coupling gap"

A device with a nonradiative dielectric waveguide which operates in a microwave band or in a millimeter wave band. The device with a nonradiative dielectric waveguide is, for example, an oscillator, a circulator, a coupler or the like. The device has a pair of parallel conductors, a dielectric strip which is disposed between the conductors and propagates a high-frequency electromagnetic wave in a specified mode, a mounting surface which is formed on one of the conductors, and an end surface which is defined by an end of each of the conductors so as to be vertical to a traveling direction of the electromagnetic wave propagated in the dielectric strip. An end of the dielectric strip is exposed at a corresponding end surface of the device. [A2573]

"Bias estimating method for a target tracking system"

The present invention is in general related to automatic alignment in multi-sensor target tracking. The process of the invention repeatedly generates estimates for sensor bias errors (b) by minimising a function, given on one hand by the magnitude of the discrepancy between measurements (M) and a measuring model, where the measuring model is a function of the unknown target location and unknown bias parameters, and on the other by the bias parameters and their predetermined statistical distributions (15) . In a preferred embodiment of the present invention, the minimizing step is performed by linearising components of the function around an approximate target position (normally obtained from the tracker (10)) and around nominal (typically zero) bias errors, and the function is subsequently minimized with respect to target positions as well as to the bias parameters (b) . In addition, possible time dependence of the bias parameters are modelled by the incorporation of process noise. [A2574]

"System and method for detecting and displaying wind shear"

A computer based method of detecting and displaying rotational wind shear. Radial wind velocities within first and second adjacent gate sweeps produced by a radar system are detected in a predetermined geographic area, and are compared at points of equal radial distance from the radar system. The radial location of gate to gate wind shear at positions between the radar system and the boundary of the radar systems range are identified and compared to a predetermined threshold wind velocity value to determine the location of high priority gate to gate wind shear. The high priority gate to gate wind shear is then graphically displayed relative to its geographic location on a graphical representation of the predetermined geographic area. A computer based system for detecting and displaying rotational wind shear is also disclosed. [A2575]

"Vehicle speed control system using wireless communications and method for controlling the same"

Disclosed a vehicle speed control system using wireless communications, the system including a driving state detecting unit for detecting a driving state and outputting corresponding signals, a transmitter/receiver for outputting low-strength signals, an electronic control unit for receiving the signals of the transmitter/receiver and establishing an ISA mode if necessary, determining if a present driving state corresponds to a first driving state, determining if the driver has performed deceleration operations and performing control into the first driving state if needed, an engine control unit for outputting signals for control of the throttle valve opening, a throttle valve electronic control unit for outputting electrical signals to a throttle valve to control the same, and a display for displaying a present mode and a vehicle state. A method for controlling the system comprises the steps of receiving signals from an RF transmitter/receiver to determine if a vehicle is in a first driving state, establishing an ISA mode and performing display of the ISA mode, determining a present driving state for comparison with the first driving state and performing display to inform the driver of the result of the comparison, determining if the driver has performed a deceleration operation if the present driving state does not correspond to the first driving state, disengaging the ISA mode and enabling full control of the vehicle by the driver if the present driving state corresponds to the first driving state or if the driver has performed a deceleration operation, and controlling an engine control unit via CAN communications if the driver has not performed a deceleration operation. [A2576]

"Method for processing radar signals"

A method for procession radar signals for a radar arrangement which is moving in relation to its environment, in particular a road vehicle radar due method include analyzing a plurality of object traces formed by objects to be detected, to determining a current moving direction, and, in response to a deviation of this moving direction from the alignment of the radar arrangement, correcting the object angle determined when detecting the objects within the scope of the angular resolution of the radar arrangement on the basis of the determined deviation, and relating it to the moving direction. [A2577]

"Portable safety mechanism with voice input and voice output"

A portable safety mechanism housed in a cane, a walking stick or a belt-carried housing. In each of such embodiments, the portable safety mechanism includes a processor, a transmitter, a receiver, and an outside image sensor or scanner, a warning device such as an audible warning device or warning light. The scanner may, for example, sense the shape of a traffic signal or the color of a traffic signal. The portable safety mechanism may further be housed in a wheelchair or walker. The portable safety mechanism may employ computer telephony technology. [A2578]

"Running surroundings recognizing apparatus"

A running surrounding recognizing apparatus is provided. The running surrounding recognizing apparatus is capable of accurately recognizing information in regard to running of a self-vehicle even if a mounting position of a sensor for running surrounding recognition is changed, and to provide a vehicle running control apparatus using the running surrounding recognizing apparatus. The running surrounding recognizing apparatus 1 comprises a communication part 11, a sensing region determining part 12 for determining a sensing region sensed by the running surrounding recognizing apparatus 1 and a sensing part 13. The communication part 11 is connected to external units through a bus 1200 to communicate data in regard to a mounting position of the running surrounding recognizing apparatus 1 on a vehicle. The sensing region determining part 12 determines the sensing region sensed by the running surrounding recognizing apparatus 1 based on the data in regard to a mounting position of the running surrounding recognizing apparatus 1 on a vehicle received through the communication part 11. The sensing part 13 outputs a sensed result based on the sensing region determined by the sensing region determining part 12 through the communication part. [A2579]

"Monitoring antenna system"

A monitoring system incorporates antennas that transmit signals at predetermined frequencies, the transmitted signals are received by tags located in the active monitoring area of the antenna which then transmit signals back to the antenna. The antennas are tuned to each desired frequency prior to driving the antennas to transmit at the desired frequency. The system transmits a range of frequencies in a sequence that uses overlapping frequency steps. The monitoring system is also constructed having a variable configuration resulting in the ability to be reconfigured under program control to conform to varying system requirements. The integrated monitoring system employs programmable formats for reconfiguration such that upon program input from a host computer the system can assume predetermined configurations to conform to the particular tasks for the specific application. The monitoring system incorporates an antenna system that employs digitally controlled, differentially driven, scanning transceivers, and walk through magnetic induction antennas positionable in various configurations to maximize detection of tags being transported through the antenna system. [A2580]

"Radar apparatus"

A vehicular radar apparatus comprising a radar beam transmission device and a reception device, and a processing unit for detecting the position of a target object from transmission signals and reception signals. The processing unit has a preceding vehicle judgment circuit for judging if a vehicle travelling in front of a subject vehicle in the same direction is the same vehicle as previously detected or not, and a signal strength comparing device for comparing the signal strength of a current reception signal reflected from the preceding vehicle, with a signal strength of a reception signal reflected from the preceding vehicle a predetermined comparison reference time prior, to thereby calculate a change amount in signal strength. When the change amount calculated by the signal strength comparing device drops beyond a previously set threshold value and it is judged by the preceding vehicle judgment device that the preceding vehicle is the same vehicle, it is judged that the detection sensitivity of the radar apparatus has dropped. [A2581]

"Electronic distance-determining apparatus and electronic security system equipped therewith"

An electronic apparatus for determining the distance between two objects has an interrogation signal generator for generating and transmitting an interrogation signal, and a response signal receiver. An evaluation unit is situated in one object, and interrogation signal reception means and response signal generation means in the other object. According to the invention, the evaluation unit is set up for determining a distance-indicative phase difference between the interrogation signal and the response signal. An electronic security system, such as a vehicle locking system of the keyless-go type, having a distance measurement of this type is also included. [A2582]

"Digital electronic locator"

A digital electronic locator which assists in locating the position and direction of an object/animal/person is described. Three configurations of the locator are presented, the first one is the basic configuration which gives an alerting means (Audio and/or visual) to indicate the location of an object/animal/person, the second configuration of the locator, in addition to providing the facility offered by the basic configuration, indicates the direction of an object/animal/person, the third configuration of the locator is used for locating person, in addition to providing the facilities offered by the basic and the second configuration it provides the direction of the searcher to the person being located who can, as well, acknowledge that he/she has been found. [A2583]

"Door control apparatus"

Door control apparatus for vehicles including at least one sensor viewing at least one region in the vicinity of a door, logic circuitry responsive to the sensor for providing at least one region clear output signal and automatic door opening and door closing apparatus responsive at least to the absence of a region clear signal to cause opening of the door and responsive at least to the presence of a region clear output signal to cause closing of the door. [A2584]

"Side impact airbag system with anticipatory sensor"

An airbag passive restraint system for protecting an occupant adjacent the door in a side impact including an airbag arranged in the door to inflate inward from the door and a side impact anticipatory sensor determining that an accident requiring deployment of the airbag is about to occur prior to the accident. The sensor is arranged to receive waves generated by, modified by or reflected from an object about to impact the vehicle resulting in the accident and is designed to identify the object based on a pattern of the received waves and determining whether the identified object will cause an accident requiring deployment of the airbag. The system also includes an inflator coupled to the sensor for inflating the airbag if the sensor determines that an accident requiring deployment of the airbag is about to occur. [A2585]

"Preventing the collision of a vehicle with an obstacle"

A process and device are disclosed for preventing a vehicle from colliding with an obstacle during parking. The object of the invention is therefore to ensure that a collision can be reliably avoided without any additional intervention of the drive. In a device with at least one sensor for generating signals which represent the distance between the vehicle and an obstacle, the signals are processed in an evaluation unit. When at least one distance-representing signal falls below a limit value, a warning signal is generated. This warning signal drives a control valve which generates a pressure difference between the working chamber and the vacuum chamber in a brake booster when the warning signal is generated. This pressure difference causes the braking pressure to rise in the wheel brake cylinder and therefore slows the vehicle down to a standstill. [A2586]

"Method and system for determining a position of a transceiver unit utilizing two-way ranging in a polystatic satellite configuration including a ground radar"

A method and system for determining the position of an object, such as an aircraft, utilizes two-way ranging with a polystatic satellite configuration and ground radar. A ground transceiver at a first known location provides a bidirectional communication path between the ground transceiver and the object wherein the ground transceiver transmits a first ranging signal to the object and the object transmits a second ranging signal to the ground transceiver in response to the first ranging signal. A first communication transceiver at a second known location provides a first unidirectional communication path between the first communication transceiver and the object wherein the first communication transceiver performs one of transmitting a third ranging signal to the object and receiving a third ranging signal from the object in response to the first ranging signal. A second communication transceiver at a third known location for providing a second unidirectional communication path between the second communication transceiver and the object wherein the second communication transceiver performs one of transmitting a fourth ranging signal to the object and receiving a fourth ranging signal from the object in response to the first ranging signal. A signal processor determines a first, second and third path length, and determines the position of the object based on the first, second and third known locations and the first, second and third path lengths. [A2587]

"Gate for radar-mounted vehicle, having partition walls not grouped or detected by radar apparatus"

A gate such as a tollgate in an expressway for radar-mounted vehicles is disclosed, by which an erroneous operation of the mounted radar apparatus can be prevented and through which the radar-mounted vehicles can smoothly pass. The gate includes two partition walls which limit a passage. The positions of the front ends of the partition walls are separated in front and behind, or the front end of one or both of the partition walls has a structure for suppressing the frontward reflection of each radiated electric, optical, or acoustic beam incident on the relevant front end. [A2588]

"Method and apparatus for sharing vehicle telemetry data among a plurality of users over a communications network"

In an Integrated Air Traffic Control System, apparatus, method, and software for sharing vehicle telemetry information between a plurality of sensors of different types and a plurality of users of different types utilizes a communications network coupling together the plurality of sensors and the plurality of users. A plurality of sensor processor devices are respectively coupled to the plurality of sensors, each sensor processor device being configured to receive vehicle telemetry information from its associated sensor, and to convert the receive vehicle information into common vehicle data of a type common to the plurality of users. A plurality of user processor devices are respectively coupled to the plurality of users, each user processor device being configured to receive a demand signal from its associated user and to transmit it to said communications network when it determines that its associated user has a predetermined vehicle profile which requires improvement. Each of the plurality of sensor processor devices receives the demand signal from the communications network and transmits its common vehicle data to the communications network when it determines that its associated sensor can provide vehicle information which improves the vehicle information profile. [A2589]

"Vehicle impact detection sensor system"

A vehicle impact detection sensor for providing an input variable for an activation logic unit or for generating an activation signal for an active occupant protection system, has a radar transmitter and a radar receiver which are arranged on a sensor-carrying superstructure of the vehicle. The radar receiver receives radar waves which are emitted by the radar transmitter and reflected at an impact-relevant reflexion surface that moves relative to the sensor-carrying superstructure in the event of an impact. A Doppler frequency evaluation unit uses the frequency of the transmitted radar waves and the frequency of the radar waves reflected from the impact-relevant reflexion surface to determine the associated Doppler frequency and detects therefrom a relative movement of the impact-relevant reflexion surface with reference to the sensor-carrying vehicle superstructure. The impact-relevant reflexion surface is a surface permanently connected to the vehicle, preferably, an outer surface of the vehicle. [A2590]

"Vehicle warning system and method based on speed differential"

The present invention provides a method, apparatus and article of manufacture for detecting the presence of one or more target vehicles and determining a distance and speed of the targeted vehicles relative to a targeting vehicle. When predetermined threshold conditions are satisfied, warning signals are output from a computer system to alert a driver of the one or more targeted vehicles. In addition, steps may be taken to determine whether the targeting vehicle and the one or more targeted vehicles will converge to create a congested condition. If so, the speed of the targeting vehicle maybe adjusted. [A2591]

"Intrusion detection process and device"

The invention relates to an intrusion detection process for detecting an intrusion within a space, in which at least two acoustic or electromagnetic signals are emitted at different frequencies (f.sub.1, f.sub.2, . . . f.sub.n) inside said space, at a point inside said space, a signal is received that is the combination of the signals emitted and reflected in said space, the characteristics of the demodulated signals of different frequencies are compared to establish the presence or absence of an intrusion, an intrusion signal is generated when the presence of an intruder is confirmed. The invention also proposes an intrusion detection device implementing the process according to the invention. [A2592]

"Vehicle surroundings monitoring device"

A vehicle surroundings monitoring device capable of performing distance measurement as desired even in a short-distance range to provide unerring alarm information to a driver. The monitoring device for monitoring surroundings around a vehicle has a transmitting antenna provided in a door mirror assembly of the vehicle to radiate transmitted waves through a mirror surface of the door mirror, and a receiving antenna provided in the door mirror assembly to receive reflected waves from an object existing near the vehicle through the door mirror surface. The monitoring device also has a stray electric wave limiting member for reducing electric wave components straying from the transmitting antenna into the receiving antenna. The stray electric wave limiting member is formed as an electric wave absorbing member provided between opening surfaces of the door mirror corresponding respectively to the transmitting and receiving antennas, a metal plate provided between the transmitting and receiving antennas, an electric wave absorbing member provided between the transmitting and receiving antennas and the door mirror except in front of the opening surfaces of the door mirror corresponding to the antennas, or a matching layer provided between the antennas and the door mirror. [A2593]

"Optimum edges for speakers and musical instruments"

The invention presents a design of optimum edges for antennas of loudspeakers, microphones, hydro-speakers, hydro-phones, brass and wind instruments, and ultrasonic transducers. These edges have a serrated-roll shape, and enhance the acoustical field strength uniformity. Loudspeakers, hydro-speakers, and ultrasonic transducers will become more effective in radiating acoustical power. The quality of these apparatuses are enriched. The musical tone emitted by loudspeakers, brass and wind instruments becomes more smooth, mellow, rich, clean, and elegant. [A2594]

"Motion detector"

The invention relates to a motion detector or proximity switch for detecting moving objects, wherein a high frequency electromagnetic radiation is generated by a free running oscillator and transmitted via a transmitter antenna. The transmitter antenna detects the Doppler modified radiation reflected by the moving object as a function of its phase position or amplitude variation. The radiation is compared with the transmitted radiation parameters in an evaluation device with a view to producing an output signal. The inventive detector is characterized in that it included a free running oscillator having a feedback guaranteed by at least one transmitter antenna ANT RX and at least one receiver antenna ANT TX which are oriented towards the object and coupled via a side or leakage radiation. [A2595]

"Tag communication protocol & system"

A method of communicating to a RF tag having a low power mode and a scan mode with a radar and an interrogator. The method comprises the steps of alternating the RF tag between the low power mode and the scan mode and then transmitting a wake-up call to the RF tag with the radar. Next, the wake-up call is received from the radar by the RF tag when the RF tag is in the scan mode. Once the wake-up call has been received, the radar will transmit a downlink message to the RF tag. Upon receipt of the downlink message, the RF tag will send an uplinked message to the radar. After the uplink message has been sent to the radar, the RF tag will return to the low power mode. By alternating the RF tag between the low power mode and the scan mode, the power consumption of the RF tag is greatly reduced thereby increasing the battery life thereof. [A2596]

"Method and system for directing a following device toward a movable object"

An automated object following system includes a tracker associated with a following device, and a guider associated with an object to be followed. The tracker includes a first processor, and at least two transducers for generating an encoded ultrasonic signal. Each transducer has a control input communicating with the first processor for emitting an encoded ultrasonic signal generally toward the guider in response to a command signal from the first processor. The encoded ultrasonic signals carry signal source identification information. A radio frequency (RF) receiver communicates with the first processor for receiving from the guider an encoded RF signal carrying distance and direction information of the guider relative to the tracker to be used for steering the following device toward the object to be followed. [A2597]

"Method and arrangement for controlling deployment of a side airbag"

Arrangement and method for controlling deployment of a side airbag to protect a vehicular occupant during a crash. The presence and/or position of the occupant is/are determined and deployment of the airbag is controlled based thereon. A transducer receives waves from a space above a seat portion of the seat and a signal representative of the presence and/or position of the occupant is generated based on the received waves. The transducer may transmits waves into the space above the seat portion. The transducer may be mounted in a door of the vehicle and possibly adjacent the airbag module. Deployment of the airbag can be suppressed, the time at which deployment of the airbag starts, the rate of gas flow into the airbag, the rate of gas flow from the airbag and/or the rate of deployment of the airbag is/are controlled based on the presence and/or position of the occupant. [A2598]

"Method of manufacturing an enclosed transceiver"

The present invention teaches a method of manufacturing an enclosed transceiver, such as a radio frequency identification ("RFID") tag. Structurally, in one embodiment, the tag comprises an integrated circuit (IC) chip, and an RF antenna mounted on a thin film substrate powered by a thin film battery. A variety of antenna geometries are compatible with the above tag construction. These include monopole antennas, dipole antennas, dual dipole antennas, a combination of dipole and loop antennas. Further, in another embodiment, the antennas are positioned either within the plane of the thin film battery or superjacent to the thin firm batter. [A2599]

"Emergency locator and communicator"

A system and method for instantly summoning assistance to the location of an emergency. A mobile unit providing subscriber communications with an operator or emergency service provider includes a beacon signal generator for directing service providers to the location of the emergency. Subscriber communications are established using an existing personal communication system. The beacon signal generator transmits a wideband spread spectrum that is analyzed at receiving stations to determine the location of the mobile unit. [A2600]

"Radar apparatus for vehicle"

A radar apparatus for use on a vehicle has a radar beam scanning mechanism for scanning a scan area with a radar beam substantially in parallel to a road surface on which the vehicle is running, and an object detector for receiving reflected waves of the radar beam to create a detected object image, based on the reflected waves. The object detector is provided with a ghost determination device for determining whether a detected object image created is a ghost. Therefore, the radar apparatus can eliminate a detected object image determined as a ghost out of detected object images created. [A2601]

"Device for mounting a distance sensor on a motor vehicle"

A device for mounting a distance sensor, in particular a proximity radar device, on a motor vehicle, the distance sensor being accommodated in a closed housing, the housing being moveably attached to a support and the support being attachable in an immoveable manner to the motor vehicle. The device is characterized in that the housing is attachable to the support by at least three screws arranged in an L-shape relative to each other, that the screws, in the installed state of the distance sensor, are able to be screwed from its front side, and that a screw-out protection is provided for at least two of the screws. [A2602]

"Low power radar level transmitter having reduced ground loop errors"

A low power radar level transmitter having reduced ground loop errors and a related method are disclosed. A microwave termination is couplable to a reference voltage such as earth ground and is coupled to a microwave transceiver through at least one low frequency isolator. The microwave transceiver generates a microwave signal along the termination which is reflected by a process product interface. A level calculator is coupled to the microwave transceiver to calculate a level of the process product based upon the received, reflected signal. A process loop communicator is coupled to the level calculator and couplable to a process control loop to communicate the calculated level across the process control loop. A power supply is couplable to the process control loop and provides power to all electrical components of the transmitter with energy received from the process control loop. [A2603]

"FM-CW radar system for measuring distance to and relative speed of target"

An FM-CW radar is provided which may be employed in anti-collision systems or cruise control systems installed in moving objects such as automotive vehicles. The radar analyzes a beat signal in frequency to produce peak frequency components in a modulated frequency-rising range wherein the frequency of a frequency-modulated radar wave transmitted from the radar increases and a modulated frequency-falling range wherein the frequency of the radar wave decreases. If one of peak frequency pairs, each of which is made up of each of the peak frequency components in the modulated frequency-rising range and one of the peak frequency components in the modulated frequency-falling range, lies within a given lower frequency range, the radar identifies the one of the peak frequency pairs as radar data arising from a moving object appearing suddenly in a radar detection zone. [A2604]

"Safety running system for vehicle"

In a safety running system, a transverse travelling distance resulting when a subject vehicle travels to a current position of an oncoming vehicle is calculated based on the vehicle velocity and yaw rate of the subject vehicle, a relative transverse distance of the oncoming vehicle relative to a vehicle body axis of the subject vehicle is calculated based on a relative distance, relative velocity and relative angle between the subject vehicle and the oncoming vehicle detected by a radar information processor. When a relative transverse deviation obtained by subtracting the transverse travelling distance from the relative transverse distance resides within a range and that state continues to exist over a predetermined time period, it is judged that there is a collision possibility of the subject vehicle with the oncoming vehicle, and automatic steering is performed so as to avoid a collision. [A2605]

"Safety running system for vehicle"

In a safety running system, a transverse travelling distance resulting when a subject vehicle travels to a current position of an oncoming vehicle is calculated based on the vehicle velocity and yaw rate of the subject vehicle, a relative transverse distance of the oncoming vehicle relative to a vehicle body axis of the subject vehicle is calculated based on a relative distance, relative velocity and relative angle between the subject vehicle and the oncoming vehicle detected by a radar information processor. When a relative transverse deviation obtained by subtracting the transverse travelling distance from the relative transverse distance resides within a range and that state continues to exist over a predetermined time period, it is judged that there is a collision possibility of the subject vehicle with the oncoming vehicle, and automatic steering is performed so as to avoid a collision. [A2606]

"Method and system for controlling vehicle speed based on vehicle yaw rate and yaw acceleration"

In an adaptive vehicle speed control system, a method and system for controlling the speed of the vehicle while the vehicle is traversing a curved path. The method and system include sensing the yaw rate of the vehicle, determining the yaw acceleration based on the yaw rate, and determining a maximum allowed speed of the vehicle on the curved path based on the yaw rate and the yaw acceleration. The method and system also include limiting the speed of the vehicle on the curved path to a value no greater than the maximum allowed vehicle speed. [A2607]

"FM-CW radar system for measuring distance to and relative speed of a target"

An FM-CW radar is provided which may be employed in anti-collision systems or cruise control systems installed in moving objects such as automotive vehicles. The radar produces a first spectrum using a portion of a beat signal in a frequency rising range wherein the frequency of the radar wave increases and a second spectrum using a portion of the beat signal in a frequency falling range wherein the frequency of the radar wave decreases and moves the second spectrum by frequency shifts which are determined as a function of the speed of a radar-mounted vehicle and corrected for compensating various errors involved in measuring the speed of the vehicle to form spectrum groups each consisting of the frequency components moved by one of the corrected frequency shifts and frequency components in the other of the first and second spectra. The radar selects an optimum one of the spectrum groups for use in determining target data. [A2608]

"Apparatus and method for locating missing persons, animals, and objects"

A micropower transponder operates in conjunction with a constellation of low-to-medium Earth-orbiting communication satellites. The transponder is attached to a person, animal, or object. The location of a missing person, animal, or lost object is ascertained by locating the transponder associated with that person, animal, or object. The transponder may be hidden in the individual's hair, timepiece, jewelry, or article of clothing, may be swallowed by the individual, may be implanted under the individual's skin, or incorporated into an inconspicuous hand-held device such as a cellular telephone, pager, or calculator. The transponder includes a receiver for receiving an interrogation radio signal and a transmitter for transmitting a response radio signal. The transponder transmits the response radio signal in response to the interrogation radio signal if the interrogation radio signal includes a code matching the access code stored in the transponder. The Doppler shift in frequency of the response radio signal is measured and the Doppler shift is used to determine the location of the transponder. [A2609]

"Vehicle control method and vehicle warning method"

In order to occur a collision warning to prevent the collision in accurate by detecting the preceding vehicle or target, a vehicle lane position estimation device comprising a means for measuring a distance between said host vehicle and said preceding vehicle or a oncoming vehicle, a direction angle from said host vehicle, an angular velocity and a velocity of said host vehicle, a means for calculating lateral and longitudinal distance between said host vehicle and said preceding vehicle or said oncoming vehicle, a means for capturing a front stationary object, a means for obtaining movement of the preceding vehicle or position of the oncoming vehicle, and a means to estimate a lane position of said front stationary object from a relationship of the stationary object being captured and the preceding vehicle being obtained and a positional relationship with the oncoming vehicle. [A2610]

"Vehicle running control apparatus, vehicle running control method, and computer program product having the method stored therein"

In a vehicle running control apparatus and method, the change of a difference in frequency between an electromagnetic wave signal transmitted from a vehicle and an electromagnetic wave signal reflected from an object is detected. Information inclusive of a distance between the object and the vehicle and a relative speed of one of the object and the vehicle to the other is generated on the basis of the change in frequency difference. A desired speed is generated on the basis of the generated information and information of the running of the vehicle so that the change in frequency difference is generated. A signal for control of the speed of the vehicle is generated on the basis of the desired speed. [A2611]

"Method for the detection especially of small sea targets"

A method for the detection of a target by a radar in the presence of noise, the detection being performed on M antenna rotations, comprises at least: a first step for the estimation of the Doppler frequency (f) of the target, a detection step, the target being detected if an associated variable Z is greater than or equal to a predetermined threshold S, the variable Z being defined according to the following relationship: ##EQU1## D.sub.t being the time domain [-t.sub.0, t.sub.0], t.sub.0 being fixed as a function of the possible errors of framing of the signals from rotation to rotation, D being the frequency domain .left brkt-bot.f.sub.d -f.sub.0, f.sub.d +f.sub.0.right brkt-bot., f.sub.0 fixed as a function of the possible errors of estimation of the Doppler frequency, z being the signal at the analyzed antenna rotation referenced "0", at the analyzed range gate references "0", z.sub.i.sup.k being the signal obtained by tracking at the rotation i of the signal z, in taking account of the tracking error in any, i.e., offset by k range gates with respect to the estimated range gate, C.sub.z,.sub.z.sub..sub.f .sub..sup.k (t,f,G) being the Cohen transform of the signals z and z.sub.i.sup.k with a kernel G, computed at the time t and the frequency f, C.sub.z.sub..sub.i .sub..sup.k, .sub.z.sub..sub.j .sub..sup.l (t,f,G) being the Cohen transform of the signals z.sub.i.sup.k and z.sub.j.sup.l of the kernel G, computed at the time t and at the frequency f, 2N.sub.d +1 being the number of range gates taken into account, according to the tracking error if any, N (i, k, j, 1) being a standardization. [A2612]

"Transmission system and coding communication method for a transmission system"

The conventional combination cannot realize an efficient road traffic system as a whole. A transmission system has a plurality of modules installed at different positions along a predetermined road. Each of the plurality of the modules includes a receiving section for receiving an input signal and a transmission section for transmitting an output signal on the basis of the input signal according to a predetermined radio scheme. Each of the plurality of the modules receives and transmits a signal, whereby the whole or part of the information contained in the signal is transmitted along the whole or part of the predetermined road. This transmission system can construct an efficient integrated road traffic system as a whole. [A2613]

"Radiometry system with an aperture synthesis type antenna and its application to hyper-frequency imaging"

A radiometry system including an aperture synthesis antenna array type, including plural antenna elements, distributed in an antenna plane relative to at least one axis, according to a determined law. Each antenna element includes first and second coupling probes sensitive to hyper-frequency electromagnetic signals with dual linear polarization in quadrature (arbitrarily referred to as horizontal and vertical polarizations) . The probes are connected two by two with electric receiving circuits to create a synthetic aperture. The horizontal (f.sub.H1 -f.sub.H4) and vertical (f.sub.V1 -f.sub.V4) coupling probes of successive antenna elements (e.sub.A1 -e.sub.A4) are oriented in the antenna plane (At') , along each of the axes (.DELTA.) , such that at least one of the horizontal or vertical probes (f.sub.H1 -f.sub.H4, f.sub.V1 -f.sub.4) presents a 180.degree. phase shift from one antenna element to the other (e.sub.A1 -e.sub.A4) , with the phase shift obtained by a sequential 90.degree. rotation of those probes (f.sub.H1 -f.sub.H4, f.sub.V1 -f.sub.V4) . Further, 180.degree. phase shifts (.PHI..sub.H2, .PHI..sub.V3, .PHI..sub.H4, .PHI..sub.V4) are applied onto the outputs of the horizontal (f.sub.H1 -f.sub.H4) and vertical (f.sub.V1 -f.sub.V4) coupling probes, when one of the orientations of an antenna element (e.sub.A1) is taken as the phase origin reference, in order to compensate for the 180.degree. phase shifts with respect to the corresponding coupling probes (f.sub.H1 -f.sub.V1) of the reference antenna element (e.sub.A1) . [A2614]

"Radar systems"

In a radar system it is necessary to distinguish signals reflected from wanted targets such as aircraft from those reflected from fixed terrain features, known as clutter. The clutter signals can in some cases be significantly stronger than the wanted signals. One method for dealing with land clutter is the use of a high resolution clutter map. The area around the radar is considered to be divided into cells, and an array of background signal estimates is maintained for these cells. Whenever a signal is received by the radar, it is compared with the stored background level for the cell it occupies, and a detection is only reported if the signal exceeds the background by a pre-set threshold. Received signals are also used to modify the stored background levels so that the clutter map adapts to the reflections from clutter which are present over long periods. Clutter maps have so far only been used successfully for radars at fixed locations. In the case of a ship-borne radar near land, a conventional clutter map will not work well. This is because as the ship moves, the positions of land scatterers relative to the ship will not be fixed. Individual terrain features will therefore be moved from one clutter map cell to another. In the cell into which a strong scatterer moves, the land clutter reflections will be reported as targets until the stored background has had time to adapt to the new higher level. Similarly, in the cell which the scatterer has left, the stored background level will be higher than necessary, and may cause actual targets to be suppressed until it has had time to adapt to the new lower clutter level. [A2615]

"Method of moment estimation and feature extraction for devices which measure spectra as a function of range or time"

The computation system of the present invention comprises an improved method of moment estimation for devices which measure spectra as a function of range or time. The preferred embodiment of this system is illustrated as part of an automated meteorological monitoring system for the accurate real time detection of meteorological phenomena, such as winds, wind shear and turbulence. This automated meteorological monitoring system uses a standard weather radar transmitter to scan a predetermined volume of space with a stream of radar pulses to determine the characteristics of meteorological phenomena that are extant in the predetermined volume. The computation system of the present invention utilizes novel signal processing algorithms in the improved method of moment estimation to excise the valid data from the returns echoes, which are corrupted by the presence of contaminating signals. Separating the valid data from the noise in this manner improves the responsiveness and accuracy of the system in which this method is implemented. [A2616]

"Method for correction of a signal of at least one sensor on the basis of which a path curve can be determined, on which the vehicle is moving"

The present invention relates to a method for correction of a signal of at least one sensor, on the basis of which a path curve can be determined, on which the vehicle is moving, with the vehicle having a device by means of which the environment of the vehicle can be identified, and with the correction of the signal of the at least one sensor being carried out in that, at at least one point in time, the object location expected at at least one further point in time of an object which is identified as being stationary is determined on the basis of the vehicle speed and of the signal of the at least one sensor, and in that, at the at least one further point in time, the object location of the object which is identified as being stationary is recorded, with a correction of the signal of the at least one sensor being carried out on the basis of the discrepancy between the expected object location and the recorded object location. [A2617]

"Location finding using a single base station in CDMA/TDMA systems"

A location or position of a wireless mobile unit is determined using only measurements from a single base station. A distance between the wireless mobile unit and the base station is calculated utilizing a roundtrip delay value of an RF uplink signal received from a wireless mobile unit. Thereafter, an angle of arrival of the received signal is determined using measurements of the received signal from each of a plurality of antenna sectors of a multi-sector antenna. The angle of arrival is determined based upon stored antenna signal measurements of the multi-sector antenna, wherein a combination of different sector signal measurements corresponds to a single angle measurement. Using the determined distance and angle of arrival, a position or location of a wireless mobile unit can easily be determined using only measurements of the single base station. [A2618]

"System and method for person or object position location utilizing impulse radio"

A System and Method for Person or Object Position Location Utilizing Impulse Radio, comprising a plurality of reference impulse radios, an object or person to be tracked having a mobile impulse radio associated therewith, an architecture with an associated positioning algorithm associated with said plurality of impulse radio reference radios and said mobile impulse radio, and display means for displaying the position of the person or object whose position is to be determined. [A2619]

"Use of a device in a vehicle, using which the environment of the vehicle can be identified by means of radar beams"

The present invention relates to a method for correction of a signal which is derived from wheel rotation speed signals and represents the vehicle speed, wherein the vehicle has a device by means of which the environment of the vehicle can be identified, and wherein the correction of the signal which is derived from the wheel rotation speeds and represents the vehicle speed is carried out on the basis of the speed at which objects in the environment which are identified as being stationary move relative to the vehicle. [A2620]

"System and method for position determination by impulse radio"

A system and a method for position determination by impulse radio using a first transceiver having a first clock providing a first reference signal and a second transceiver placed spaced from the first transceiver. The system determines the position of the second transceiver. The second transceiver has a second clock that provides a second reference signal. A first sequence of pulses are transmitted from the first transceiver. The first sequence of pulses are then received at the second transceiver and the second transceiver is then synchronized with the first sequence of pulses. A second sequence of pulses are transmitted from the second transceiver. The first transceiver receives the second sequence of pulses and the first transceiver is synchronized with the second sequence of pulses. A delayed first reference signal is generated in response to the synchronization with the second sequence of pulses. A time difference between the delayed first reference signal and the first reference signal is then measured. The time difference indicates a total time of flight of the first and second sequence of pulses. The distance between the first and the second transceiver is determined from the time difference. The direction of the second transceiver from the first transceiver is determined using a directional antenna. Finally, the position of the second transceiver is determined using the distance and the direction. [A2621]

"Method for multi-directional anticipatory arming of vehicle restraints"

A method for multi-directional anticipatory arming of restraint systems in a motor vehicle includes the steps of monitoring outputs from impact radar sensors located on the vehicle. The method also includes the steps of determining whether an impact range is less than a predetermined value, obtaining a closing velocity (CV) , and determining a supervisory time window (STW) . The method further includes the steps of determining whether at least one of the CV and STW are within predetermined limits and setting a velocity arming flag to activation of the restraint systems if the CV and STW are within the predetermined limits. [A2622]

"System and method for distance measurement by inphase and quadrature signals in a radio system"

A system and a method for distance measurement utilizes a radio system. The distance is measured by determining the time it takes a pulse train to travel from a first radio transceiver to a second radio transceiver and then from the second radio transceiver back to the first radio transceiver. The actual measurement is a two step process. In the first step, the distance is measured in coarse resolution, and in the second step, the distance is measured in fine resolution. A first pulse train is transmitted using a transmit time base from the first radio transceiver. The first pulse train is received at a second radio transceiver. The second radio transceiver synchronizes its time base with the first pulse train before transmitting a second pulse train back to the first radio transceiver, which then synchronizes a receive time base with the second pulse train. The time delay between the transmit time base and the receive time base can then be determined. The time delay indicates the total time of flight of the first and second pulse trains. The time delay comprises coarse and fine distance attributes. The coarse distance between the first and second radio transceivers is determined. The coarse distance represents the distance between the first and second radio transceivers in coarse resolution. An in phase (I) signal and a quadrature (Q) signal are produced from the time delay to determine the fine distance attribute. The fine distance indicates the distance between the first and second transceivers in fine resolution. The distance between the first and second radio transceivers is then determined from the coarse distance and the fine distance attributes. [A2623]

"Method and system for determining a regulator object"

A method for determining a control object which is situated in an expected traveling corridor of a vehicle whose distance from the control object is measured and adjusted to a desired distance. The method for reliably determining the control object which enables reliable distance control even in the event of momentary and sudden changes in the traveling corridor of the vehicle determines an object corridor which covers the traveling corridor and is wider than the traveling corridor of the vehicle, control with respect to the control object being effected as long as the latter stays in the object corridor of the vehicle. [A2624]

"Device for acquiring lane path indicative data"

A device for acquiring data indicative of the path of a lane is provided. The device incorporates a lane detection sensing circuit, an object position sensing circuit that detects at least the distance of an object located in front of the vehicle and its directional angle relative to the direction of vehicle motion, and a sensing circuit for the vehicle's own motion. An estimating device is provided that is supplied with lane recognition measurement data, object position measurement data, and measurement data on the vehicle's own motion. As a function of the vehicle's own motion, the estimating device determines the lane curvature and/or the transverse position of an object ahead of the vehicle relative to the lane by estimation, using a presettable estimation algorithm including a dynamic vehicle motion model. The device preferably includes a Kalman filter for this purpose, and is used, for example, in road vehicles. [A2625]

"Interference preventing device for vehicle"

The present invention prevents the interference of vehicles traveling on-coming to each other when a plurality of vehicles are traveling on-coming to each other on a traveling path with a predetermined road width without increase in cost caused by setting a wide course width and without a drop in work efficiency caused by decreasing velocity. If one of the vehicles detects the other vehicle by its obstacle detection means when the vehicles are traveling on-coming to each other, the vehicle which detects the other vehicle begins deceleration to stop itself. At the same time, this vehicle transmits a deceleration control command for stopping the other vehicle to the other vehicle via transmission/reception means, therefore the other vehicle starts deceleration even if this vehicle cannot detect an obstacle. The present invention is also applied when unmanned vehicles using autonomously guidance traveling based on the course data and traveling position data or an unmanned vehicle and a manned vehicle pass each other on the going and coming paths immediately adjacent to each other, where each vehicle has communication means for transmitting traveling position data of the respective vehicle and receiving traveling position data of the other vehicle, an unmanned vehicle has approach detection means for detecting the approach of the other vehicle based on its own traveling position data and position data of the other vehicle, and traveling control means for shifting its own vehicle toward the road shoulder side at detection of an approach. [A2626]

"Method of determining the distance between and object and a device of varying location"

A system and method for determining the distance between an object and a device of varying location, in which a first or second sensor arranged on the device emits a signal which is reflected by the object. The reflected signal is received by the sensor transmitting the signal and by the respective other sensor, and an evaluation device determines the propagation times between the transmission of the signal and the reception of the signal for each sensor and determines therefrom all the possible positions of the objects relative to the device of varying location referred to the sensor. The distance from the motor vehicle being determined from the corresponding positions of the measurements. A highly accurate result of the distance measurement is permitted in conjunction with a minimum evaluation time, the evaluation device determines corresponding positions from the measured data in a first, very accurate evaluation method and subsequently determines further corresponding positions on the remaining unverified measured data in a second, less accurate evaluation method. [A2627]

"Mobile communication apparatus with distance measuring unit"

A first station can communicate with a second station by radio. The second station has a function of repeating a received radio signal. A radio communication apparatus in the first station includes a first device for transmitting a first radio-frequency signal containing a predetermined pseudo-noise code signal toward the second station. In the radio communication apparatus, detection is made as to a first timing at which the first device transmits the first radio-frequency signal. A second radio-frequency signal is received by the radio communication apparatus after the first device transmits the first radio-frequency signal. The second radio-frequency signal is converted into a baseband signal. A memory stors the predetermined pseudo-noise code signal. Calculation is made as to a correlation between the baseband signal and the predetermined pseudo-noise code signal stored in the memory. A second timing at which the calculated correlation peaks substantially is detected. The time interval between the first timing and the second timing is calculated. The distance between the first station and the second station is calculated on the basis of the calculated time interval. [A2628]

"Methods and arrangements for determining the position of an occupant in a vehicle"

Arrangements and method for determining the position of an occupant of a vehicle situated on a seat in the vehicle in which the position of the seat or a part thereof, e.g., the seat portion or back portion, is determined relative to a fixed point of reference to thereby enable an approximation of the position of the occupant to be obtained. The payout of a seatbelt from a seatbelt retractor can be measured and used to better provide the actual position of the occupant. An additional approximation of the position of the occupant can be obtained by receiving waves from the space above the seat in order to improve the determination of the likely, actual position of the occupant. Once the position of the occupant is determined, it can be used in the control of a deployable occupant restraint device such as an airbag. [A2629]

"Follow-up cruise control apparatus"

To maintain a predetermined distance to each of obstacles ahead of own vehicle, a follow-up cruise control apparatus calculates traveling direction target acceleration and deceleration of own vehicle, and treats, as s safe acceleration and deceleration, the product of the traveling direction target acceleration and deceleration and a weight coefficient determined by a distance between the front obstacle and the center line of the course of own vehicle. The follow-up cruise control apparatus selects a front obstacle having a safe acceleration and deceleration with the highest degree of risk of collision, from among all front obstacles ahead of own vehicle. Based on the safe acceleration and deceleration of the front obstacle, the follow-up cruise control apparatus prevents own vehicle from dangerously closely approaching or colliding with the front obstacle by restricting the driving power of own vehicle typically determined by an acceleration operation by a driver or by amplifying the braking power of own vehicle typically determined by a braking operation by the driver. [A2630]

"Range rate aiding in a pulsed radar system"

A timing and control method and apparatus (111) for performing precise range rate aiding includes a range gate delay means (114) for generating an estimate of the range gate delay (135) each pulse repetition interval as a function of the initial range (134) and velocity (133) provided by a processor (104) . The range gate delay (135) is converted into a coarse delay (138) defining the integral number of clock cycles preceding the range gate, and a fine delay (139) for positioning a range gate to within a fraction of a clock cycle. Fine temporal control is achieved using programmable delay lines (117) and (118) , which retard various control signals, including the system clock signal (131) , in accordance with the fine delay (139) . A modified signal (126) then drives a counter means (119) which outputs a signal (128) that defines an analog-to-digital sampling window beginning at the elapse of the range gate delay (135) . The apparatus (111) may further include a rate reducing means (115) for reducing the frequency at which the range gate delay (135) is generated, thereby permitting the delay (135) to be precisely regulated to within a fraction of a nanosecond over a period of multiple pulse repetition intervals. [A2631]

"Obstacle detection system for a vehicle"

An obstacle detection system for a vehicle which is capable of detecting nearby and remote objects successfully by use of a combination of an electromagnetic wave sensors and ultrasonic wave sensors. The system of the present invention includes a plurality of ultrasonic wave sensors each transmitting an ultrasonic wave around the vehicle and receives a reflected wave thereof for detection of nearby obstacles around the vehicle, and an electromagnetic waver sensor which transmits an electromagnetic wave in a forward direction of the vehicle and receives a reflected electromagnetic wave thereof for detection of a remote obstacle. The system includes a vehicle speed sensor is provided for sensing a speed of the vehicle. A detection unit detects a presence of the nearby obstacle based upon the reflected ultrasonic wave when the vehicle speed equals to a predetermined reference speed or less, and detects a position of the remote obstacle relative to the vehicle only based upon the reflected electromagnetic wave when the vehicle speed exceeds the reference speed. The detection unit issues a nearby signal upon detection of the nearby obstacle and issues a remote signal when the position of the remote obstacle is within a predetermined long distance from the vehicle. A warning unit gives warnings respectively in response to the nearby and remote signals. [A2632]

"System and method for projecting storms using NEXRAD attributes"

The subject invention provides an improved system and method for combining data obtained from the NEXRAD.TM. system of the National Weather Service ("NWS") with geographical and topological database information to achieve an improved and informative graphical storm-tracking display able to project the movement of a storm with a single user-operation. The method of projecting storm movement includes the following steps: collecting NEXRAD data attributes from a weather data source, calculating storm position using the collected NEXRAD attributes, calculating projected storm movement using the storm position and the collected NEXRAD attributes, displaying a graphic representation of the projected storm movement. [A2633]

"Hierarchical data matrix pattern recognition system"

The present invention relates to a hierarchical artificial neural network (HANN) for automating the recognition and identification of patterns in data matrices. It has particular, although not exclusive, application to the identification of severe storm events (SSEs) from spatial precipitation patterns, derived from conventional volumetric radar imagery. To identify characteristic features a data matrix, the data matrix is processed with a self organizing network to produce a self organizing feature space mapping. The self organizing feature space mapping is processed to produce a density characterization of the feature space mapping. The self organizing network is preferably completely unsupervised. It may, under some circumstances include a supervised layer, but it must include at least an unsupervised component for the purposes of the invention. The "self organizing feature space" is intended to include any map with the self organizing characteristics of the Kohonen Self Organizing Feature Map. The frequency vector of a CAPPI image that has been derived is a data abstraction that can be displayed directly for examination. In preferred embodiments, it is presented to a classification network, e. g. the standard

CPN network, for classifying the density vector representation of the three dimensional data and displaying a representation of classified features in the three dimensional data. A novel methodology is preferably used for incorporating vigilance and conscience mechanisms in the forward counterpropagation network during training. [A2634]

"Methods of tagging an object having a conductive surface"

A transponder module includes a circuit board having top and bottom surfaces and an inverted-F receive antenna formed on the circuit board. The receive antenna includes a ground plane formed on one of the surfaces and an active element formed above the ground plane. The module also includes a RF engine having an input coupled to the receive antenna, an output and a power supply input. The module additionally includes a RF decoupling network having first and second ports. The first port is coupled to the output of the RF engine. The module further includes an inverted-F backscatter antenna coupled to the second port of the RF decoupling network. The backscatter antenna includes a second ground plane formed on one of the surfaces and a second active element formed above the second ground plane. A method of tagging an object having a conductive surface includes coupling a transponder module including a low profile antenna to the conductive surface such that a ground plane contained in the transponder module is adjacent the conductive surface of the object and transmitting a signal from the low profile antenna to an interrogator, the signal including information relevant to the object. [A2635]

"Vehicle collision warning system"

A vehicle collision warning system includes a distance measuring device for measuring a distance from a subject vehicle to an obstacle in front of the subject vehicle, a speed detecting device for detecting a speed of the subject vehicle, a control device for receiving signals from the distance measuring device and the speed detecting device and estimating a possibility of collision to the obstacle based on the received signals, and an alerting device electrically connected to the control device. When the control device determines that there is a possibility of collision, the alerting device receives a signal from the control device and emits a first alarm to the subject vehicle and provides a second alarm to a following vehicle without awaiting an action of a driver of the subject vehicle. [A2636]

"GPS vehicle collision avoidance warning and control system and method"

GPS satellite (4) ranging signals (6) received (32) on comm1, and DGPS auxiliary range correction signals and pseudolite carrier phase ambiguity resolution signals (8) from a fixed known earth base station (10) received (34) on comm2, at one of a plurality of vehicles/aircraft/automobiles (2) are computer processed (36) to continuously determine the one's kinematic tracking position on a pathway (14) with centimeter accuracy. That GPS-based position is communicated with selected other status information to each other one of the plurality of vehicles (2) , to the one station (10) , and/or to one of a plurality of control centers (16) , and the one vehicle receives therefrom each of the others' status information and kinematic tracking position. Objects (22) are detected from all directions (300) by multiple supplemental mechanisms, e.g., video (54) , radar/lidar (56) , laser and optical scanners. Data and information are computer processed and analyzed (50,52,200,452) in neural networks (132, FIGS. 6-8) in the one vehicle to identify, rank, and evaluate collision hazards/objects, an expert operating response to which is determined in a fuzzy logic associative memory (484) which generates control signals which actuate a plurality of control systems of the one vehicle in a coordinated manner to maneuver it laterally and longitudinally to avoid each collision hazard, or, for motor vehicles, when a collision is unavoidable, to minimize injury or damage therefrom. The operator is warned by a heads up display and other modes and may override. An automotive auto-pilot mode is provided. [A2637]

"System and method for detecting and displaying wind shear"

A computer based method of detecting and displaying rotational wind shear. Radial wind velocities within first and second adjacent gate sweeps produced by a radar system are detected in a predetermined geographic area, and are compared at points of equal radial distance from the radar system. The radial location of gate to gate wind shear at positions between the radar system and the boundary of the radar systems range are identified and compared to a predetermined threshold wind velocity value to determine the location of high priority gate to gate wind shear. The high priority gate to gate wind shear is then graphically displayed relative to its geographic location on a graphical representation of the predetermined geographic area. A computer based system for detecting and displaying rotational wind shear is also disclosed. [A2638]

"Player position detection system"

A system for locating players on a field includes first and second directional scanning antennas located adjacent the field. A transponder carried by the players detects the radiation from each antenna and transmits timing signals. The timing signals are received at a central station and compared to reference timing signals synchronized with the scanning of the antennas to provide an indication of the angular position of each player from the scanning antenna locations. The actual field position of the players can then be computed. The system can also locate the position of a playing object, such as a ball. [A2639]

"Apparatus for evaluating occupancy of a seat"

An apparatus for evaluating occupancy of a seat in which electromagnetic radiation is emitted into a space above the seat, the emitted electromagnetic radiation returning from the direction of the seat is detected, and a processor determines the presence of an occupying item of the seat based on the detected electromagnetic radiation and if an occupying item is present, distinguishing between different occupying items to thereby obtain information about the occupancy of the seat. The electromagnetic radiation may be visible light or infrared radiation. An apparatus for controlling a deployable occupant restraint device in a vehicle to protect an occupant in a seat in the vehicle during a crash includes the evaluating apparatus and the processor further affects the deployment of the occupant restraint device based on the determined presence or absence of an occupying item and the information obtained about the occupancy of the seat. [A2640]

"Safety running system for vehicle"

In a safety running system, a transverse travelling distance resulting when a subject vehicle travels to a current position of an oncoming vehicle is calculated based on the vehicle velocity and yaw rate of the subject vehicle, a relative transverse distance of the oncoming vehicle relative to a vehicle body axis of the subject vehicle is calculated based on a relative distance, relative velocity and relative angle between the subject vehicle and the oncoming vehicle detected by a radar information processor. When a relative transverse deviation obtained by subtracting the transverse travelling distance from the relative transverse distance resides within a range and that state continues to exist over a predetermined time period, it is judged that there is a collision possibility of the subject vehicle with the oncoming vehicle, and automatic steering is performed so as to avoid a collision. [A2641]

"Dynamic monitoring of vehicle separation"

A system for monitoring operation and location of a first moving vehicle relative to a second moving vehicle. A minimum separation distance between the first and second vehicles is estimated, based on the first vehicle velocity, and optionally on the second vehicle velocity, using location determination (LD) signals received from satellite-based transmitters from GPS, GLONASS and LEO satellites, or from ground-based signal sources such as LORAN signal towers, and using ranging signals from SONAR, RADAR or a similar system. The minimum separation distance is compared with the actual separation distance at selected times, and a vehicle driver is advised if the actual separation distance is too small, if the separation distance is decreasing too quickly, or if the second vehicle velocity is decreasing too quickly. The second vehicle may travel in the same traffic lane, in an adjacent lane, or on a road that intersects the road used by the first vehicle. Where the first and second vehicles travel on separate roads that will intersect, the system estimates whether the second vehicle will stop, or will be able to stop, at the intersection. The second vehicle may be a railroad car, such as a locomotive, or a road vehicle. A maximum vehicle clear-view velocity, consistent with vehicle stopping within a selected distance, is estimated. Road conditions are estimated and compensated for in estimating the minimum separation distance and/or the maximum vehicle clear-view velocity. [A2642]

"Method and apparatus for determining the speed and location of a vehicle"

Disclosed is a method and apparatus for measuring the speed of a vehicle by transmitting a wave beam directed at the vehicle, receiving a part of the wave beam reflected by the vehicle, comparing the reflected beam part with the transmitted wave beam and deriving from this comparison the speed of the vehicle, wherein during the speed measurement the position of the vehicle is also determined. A vehicle committing an offense can thus be identified unambiguously in a recording which is made after detection of the speeding offense. The speed of the vehicle can be determined from a difference in wavelength detected during the comparison between the reflected beam part and the transmitted wave beam, while the position of the vehicle is determined from a time lag detected during the comparison between the moment of transmitting and the moment of receiving the reflected beam part. [A2643]

"Method for processing radar signals"

For a radar device arranged above a reflecting surface, a method is suggested for estimating the height of an object above the surface. This method does not require a refined angle resolution for the radar antenna and is based solely on the processing of signals. The invention makes use of the appearance of an interference pattern for the radiation field of the radar antenna, which normally is viewed as a disadvantage, by evaluating the intensity modulation of a signal received from an object moving in radial direction to the radar device within the surveillance range. Together with the measured distance to the object, this is used to estimate a value for the height of the object above the road surface. [A2644]

"Radar method used in a motor vehicle"

The invention relates to a radar method for an automatic intelligent traffic control (AICC) in a motor vehicle. The use of a frequency modulation continuous wave method (FM-CM) is suggested in order to securely detect the distance to, relative speed and angle of a preceding motor vehicle. It is furthermore suggested according to the invention that when using an A/D converter 5 with 8-bit resolution, the necessary dynamics are generated by means of a level switchover, that the R, V information is generated in FFTs [Fast Fourier Transformations] 6 with blocked R and V-FFTs, that the useful signals are separated from the noise in a detection device 7 by means of a R-dependent adaptive CFAR threshold, that in a track formation 8, the detection is directly assigned to the tracks and that the association of a detection i to a track j is in the process computed as probability r (i, j) . [A2645]

"Vehicular front monitoring apparatus"

A vehicular front monitoring apparatus which can reliably recognize a road configuration ahead of an own-vehicle through simpler computation. The apparatus comprises a distance measuring unit for radiating electromagnetic waves or the likes in plural directions, and detecting distances from an own-vehicle to a plurality of objects around the own-vehicle and lateral positions of the objects relative to a running direction of the own-vehicle, thereby measuring object positional data on coordinates defined by the running direction and a transverse direction of the own-vehicle, a road curvature estimating unit for estimating a curvature of a road ahead of the own-vehicle through Hough transform of the object positional data measured by the distance measuring unit, and a vehicle's own lane determining unit for determining whether other vehicles running ahead are in the same lane as the own-vehicle or not based on the curvature of the road estimated by the road curvature estimating unit. [A2646]

"Vehicle with object detection device"

An object detection device for detecting objects in a rear lateral area of a vehicle includes zero-contact radiation-based scanners for scanning such area, and an evaluation unit connected to the scanners. According to the invention, the evaluation unit evaluates the time sequence of the scanning information from two or more strip-shaped portions of the area under observation, with horizontal components that are differently inclined to the lengthwise direction of the vehicle or are offset from one another in the lengthwise direction of the vehicle. The evaluation unit distinguishes objects moving in the travel direction of the vehicle from standing and oncoming objects, based on the response sequence for the portion under observation. [A2647]

"Radar interferometry device"

The invention relates to radar interferometry apparatus comprising at least one emitter satellite (E) and a constellation of receiver satellites (S) . The receivers are accurately synchronous and their orbits have the same eccentricity which is different from that of the orbit of the emitter. During one orbital period, the satellites travel round a relative ellipse (G) over which they are uniformly distributed. The invention provides applications specifically to measuring ocean currents, measuring world topography, and differential interferometry. [A2648]

"Rocket trajectory estimating method, rocket future-position predicting method, rocket identifying method, and rocket situation detecting method"

There is provided a rocket trajectory estimating method comprising the steps of: measuring a GLOS angle of a flying rocket a tracking system, passing the GLOS angle data through a batch filter to reduce noises, estimating a rocket trajectory on the basis of the GLOS angle data, the noises of which have been reduced, passing the resulting rocket trajectory data through a Kalman filter to reduce biases, and estimating the rocket trajectory again on the basis of the corrected GLOS angle data and the positional information of the tracking system. Thus, there is provide a rocket trajectory estimating method capable of reducing observation errors (noises and biases) of a tracking system of a passive ranging system, which does not have need of any laser range finders, to enhance the accuracy of rocket trajectory estimation. [A2649]

"Environmental location system"

A system and method for determining a location. The system employs encoded information devices dispersed through the environment, each having a non-unique code associated therewith. The codes from the encoded information devices are acquired as a reading device passes nearby, and stored. The codes from a proximate set of information devices are correlated with a map or mapping relation to determine one or more consistent positions within the environment. The information devices are preferably passive acoustic wave transponders, and the mapping relation may be a pseudorandom sequence or a defined map. [A2650]

"Scanning apparatus"

Scanning apparatus which scans input radiation from a scene and output radiation is transmitted to a receiver system, for example a millimetre wave imaging camera or a radar receiver by a rotatable reflective plate having an axis of rotation passing through the centre of its surface, secondary reflector and static reflector, wherein the secondary reflector is a second rotatable reflective plate having a common axis of rotation with the first rotatable reflective plate, wherein the common axis of rotation is inclined at a non-zero zero angle .theta..sub.b to the normal to the second reflective plate. The normal to the first rotatable plate is inclined at a small angle to the common axis of rotation, typically a few degrees and forms the secondary reflector. The static reflector may be a polarising roof reflector through which radiation is input to and output from the apparatus. The apparatus also includes a 45.degree. Faraday rotator or a birefringent surface such as a Meander-line. An additional Faraday rotator and an inclined polariser may be included in the apparatus and arranged such that radiation output to the receiver system may be separated from the path of input radiation. Alternatively, the scanning apparatus may include a reflector lens arrangement, such that focused output radiation may be output directly to the receiver system. [A2651]

"Fast acquisition of GPS signal corrupted by doppler or time delay effects"

An RF translator is placed on an artillery shell. The RF translator receives a GPS signal, converts the GPS signal to an S band signal, and then transmits the S band signal. The S band signal is received by a ground antenna and it is converted back to an L1 GPS signal. The transmission of the S band signal to a ground antenna induces two effects which make fast direct P (Y) acquisitions difficult. First, since the artillery shell is moving, a carrier Doppler is induced on the S band signal. Second, the time delay caused by the transmission of the S band signal affects the nominal code phase for acquisition. Acquisition of GPS signals corrupted by second frequency data effects require special compensation if fast direct P (Y) code acquisition is desired. A carrier Doppler and a code phase compensation term allow the GPS ground receiver software to focus its search window for the carrier frequency (code rate) and the code phase (time delay) . By adding in these new compensation terms, small centered searches can be used and fast direct P (Y) code acquisition is possible. [A2652]

"Relative velocity detecting apparatus for automotive vehicle"

In a relative velocity detecting apparatus for an automotive vehicle applicable to an automatic vehicular velocity control system to follow up a preceding vehicle, an inter-vehicle distance detector is provided which is disposed on the vehicle so as to be oriented toward a forward detection zone of the vehicle to detect an inter-vehicle distance to the preceding vehicle which is running ahead of the vehicle, to recognize whether the preceding vehicle has entered the forward detection zone and to derive the inter-vehicle distance value lrn (n=1, 2, . . ., n) whenever a predetermined period of time has passed when recognizing that the preceding vehicle has entered the forward detection zone, a relative velocity calculator is provided to perform a band pass filter calculation for the inter-vehicle distance value lrn, the band pass filter being expressed as: CF0.multidot.S/ (S.sup.2 +CF1.multidot.S+CF0) , wherein CF0 and CF1 denote constants, and to calculate a relative velocity value vr of the preceding vehicle to the vehicle according to the above equation, and an initial value setting section is provided to set a first initial value lr0 of the inter-vehicle distance value and a second initial value vr0 of the relative velocity value in the band pass filter calculation by the relative velocity calculator during a run of the vehicle. [A2653]

"System for processing weather information"

A method for automatically generating weather alerts in disclosed. Weather related data is automatically collected and processed to detect the presence of storm cells, their location, direction and speed. Alerts are automatically generated when necessary. These alerts contain information related to the nature of the storm cell, its location, the specific geographic areas likely to be affected by the storm cell, and the storm cell's expected time of arrival at each specific geographic area. [A2654]

"Underground pipe locating system"

A system for locating and identifying underground pipes, utilizing a ground-probing radar. The ground-probing radar system includes an antenna module and a transmit/receive sub-system. The system also includes a digital signal processing sub-system for processing the received signal to extract data corresponding to detected differences in dielectric constant and a master controller. The system still further includes a positioning sub-system, a display sub-system, a user interface and a data storage mechanism, display data and said operating parameters. [A2655]

"Moving object control system"

A method is provided for controlling two objects relatively moveable with respect to each other. A plurality of receivers are provided for detecting a distinctive microwave signal from each of the objects and measuring the phase thereof with respect to a reference signal. The measured phase signal is used to determine a distance between each of the objects and each of the plurality of receivers. Control signals produced in response to the relative distances are used to control the position of the two objects. [A2656]

"Marine vessel traffic system"

The marine Vessel Traffic System (VTS) is an improved radar harbor surveillance sensor, computer and display system that monitors marine harbor traffic, provides advisories to vessels in areas selected by the system operators, and provide the operators of the system with an early warning of unacceptable traffic conflicts in the confined waterways of the harbor. The VTS collects harbor traffic information from multiple remote sensor collection sites around the harbor and integrates, records, merges and presents the remote site data onto a single operator display, selected from a plurality of operator displays. VTS provides quick accurate computer generated graphic display of the harbor traffic, possible surface and subsurface conflicts, and key vessel identification information and the VTS documents incidents and traffic conditions for the Coast Guard or other waterway authorities. [A2657]

"Apparatus for calculating deflection of central axis of an obstacle detecting apparatus mounted on a vehicle and apparatus for correcting the deflection of central axis, and system for controlling distance to a preceding vehicle traveling ahead"

The present invention aims to facilitate easy correction of the center axis of an obstacle detecting apparatus for a vehicle by calculating deflection of the center axis with respect to the vehicle. Each of most obstacles recognized as moving objects is a preceding vehicle 93, and when the subject vehicle 91 is moving straight, the preceding vehicle 93 is detected in a position straight ahead of the subject vehicle 91. If the optical axis 95 of the transmitting/receiving section 31 is oriented straight ahead of the subject vehicle 91, the preceding vehicle 93 will be detected on the optical axis 95. On the other hand, when the optical axis 95 deviates from the center axis of the vehicle, the preceding vehicle 93 is detected in a position deviated from the optical axis 95 by an angle .theta. m. In this case, the value .theta. of deflection of optical axis 95 is equal to -.theta. m. In addition, by determining whether or not the relative velocity vector component of an obstacle is within a given range, the accuracy of calculation can be bettered with data of vehicles moving in an adjacent lane and data of vehicles moving along a curve being removed. [A2658]

"Sensing apparatus"

An apparatus for determining various physical quantities such as temperature, pressure, stress, strain, distance and the like in a manner such that a change in the physical quantity of interest results in a measurable change in the frequency of oscillation of a signal generated within the apparatus. [A2659]

"Moving body detection system"

A moving body detection system for detecting moving bodies by transmitting and receiving signals between the moving bodies. Each moving body transmits an ID code capable of identifying the moving body itself. A detection side moving body receives the ID code signal based on changes in driving conditions, discriminates the received ID signal, and transmits a detection signal with the ID code and the ID code of the detection side moving body itself added thereto. A non-detection side moving body receives the detection signal, and transmits a response signal with its own ID code and the ID code of the detection side moving body added if the ID code added to the detection signal is the same as its own ID code. Furthermore, the detection side moving body receives the response signal and measures the distance to the non-detection side moving body having the same ID code as the response signal. [A2660]

"Communication module for a means of transportation"

A communication module for a vehicle including an automobile, a vessel or the like, the communication module being disposed on a back side or inside of an identification plate of the means of transportation. The communication module is formed of a millimeter wave integrated circuit section and a plane antenna section. The millimeter wave integrated circuit section has two conductive plates arranged in parallel with each other, and a dielectric stripline and an electric element disposed between the conductive plates. The plane antenna section has two conductive plates arranged in parallel with each other, a dielectric stripline disposed between the conductive plates and a slot made in one of the conductive plates. At least a respective one of the conductive plates of the millimeter wave integrated circuit section and a respective one of the conductive plates of the plane antenna section are integrated in a plane. The identification plate is made of a material which transmits a millimeter wave with a small loss, for example, polycarbonate, polybutylene terephthalate, polypropylene reinforced with glass fiber, ABS resin or the like. [A2661]

"Method for use with analog FM cellular telephones"

A method for determining the location of a mobile unit within a cellular system. A synchronized signal at a common phase is generated at each base station in a system. The mobile unit transmits a signal tone. Each base station compares the phase of the signal tone to the common phase of the synchronized signal to produce a phase offset. A system controller compares the difference between the phase offset of a first base station and the phase offset of a second base station and determines the difference in distance between the first base station and the mobile unit and the second base station and the mobile unit defining a hyperbolic curve of locations. The system controller determines the intersection of the first and second hyperbolic curves thus determining the location of the mobile unit. The mobile station transmits the signal tone on a second channel that is distinct from a first channel over which user information is transmitted. The mobile station switches to the second channel in response to a request by a base station to the mobile station. [A2662]

"Signal processing method in a motor vehicle radar system and radar system therefor"

A signal-processing method for a motor-vehicle radar arrangement is specified, which method provides more extensive information on the traffic situation in observation direction by evaluating echo signals deflected at the road surface. [A2663]

"Method and apparatus for performing three-dimensional alpha/beta tracking"

A computer-implemented method and apparatus for performing alpha-beta tracking, which generate an alpha curve, representing position errors between a predicted three-dimensional position and a reported three-dimensional position of the track of interest at a plurality of times, generate a beta curve, representing velocity errors between a predicted velocity and a reported velocity of the track of interest at the plurality of times, plot the alpha curve and the beta curve in a probability versus error plane, determine an acceleration and a change in acceleration for the track of interest at each of the plurality of times, and perform three-dimensional alpha-beta tracking on the track of interest such that as the three-dimensional alpha-beta tracking moves along the alpha curve and the beta curve in the probability versus error plane in a first direction, when a magnitude of the change in acceleration is negative, the three-dimensional alpha-beta tracking continues to move along the alpha curve and the beta curve in the first direction and when the magnitude of the change in acceleration is positive, the three-dimensional alpha-beta tracking moves along the alpha curve and the beta curve in a second direction, opposite to the first direction. [A2664]

"Transponder system for localization of an object"

A transponder system is provided which presents a light weight portable or mobile system for localization of movable objects, e.g., for surveillance of valuable transports and the like. The small unit constituting the transponder contains a receiver (1) of paging type, a decoder (2) , a logic unit (3) , a transmitter portion (10) , a built-in antenna and power supply (11) . The system is controllable by an existing tested radio system for paging. One advantage of utilizing an already existing paging system is that functionality is well tested and a general covering range is obtained. In addition, costs for building up and operation of a paging system are eliminated. Control information being sent to the transponder includes a number of symbols defining a certain basic function for the built-in marker transmitter (10) and symbols which constitute control code and control data for the specific function. Consequently at least the frequency, transmit power and transmitting sequences of the marker transmitter are controllable. [A2665]

"Transponder modules, RF tagging system, method of operating a transponder module and methods of tagging an object having a conductive surface"

A transponder module includes a circuit board having top and bottom surfaces and an inverted-F receive antenna formed on the circuit board. The receive antenna includes a ground plane formed on one of the surfaces and an active element formed above the ground plane. The module also includes a RF engine having an input coupled to the receive antenna, an output and a power supply input. The module additionally includes a RF decoupling network having first and second ports. The first port is coupled to the output of the RF engine. The module further includes an inverted-F backscatter antenna coupled to the second port of the RF decoupling network. The backscatter antenna includes a second ground plane formed on one of the surfaces and a second active element formed above the second ground plane. A method of tagging an object having a conductive surface includes coupling a transponder module including a low profile antenna to the conductive surface such that a ground plane contained in the transponder module is adjacent the conductive surface of the object and transmitting a signal from the low profile antenna to an interrogator, the signal including information relevant to the object. [A2666]

"Method and apparatus for disabling an airbag system in a vehicle"

Method and apparatus for disabling an airbag system for a seating position within a motor vehicle in which one or more electromagnetic wave occupant sensors are situated in a roof above the seat, the presence or absence of an occupant of the seating position is detected using the electromagnetic wave occupant sensor (s) , the airbag system is disabled if the seating position is unoccupied, the proximity of an occupant to the airbag door is detected if the seating position is occupied and the airbag system is disabled if the occupant is closer to the airbag door than a predetermined distance, i.e., out-of-position. Further, the airbag deployment parameters, e.g., rate of inflation and time of deployment, may be modified to adjust inflation of the airbag according to proximity of the occupant to the airbag door. The presence or absence of the occupant is preferably accomplished using pattern recognition techniques to process the waves received by the electromagnetic wave-occupant sensor (s) . [A2667]

"Apparatus and method for controlling inter-vehicle distance to another vehicle traveling ahead of automotive vehicle equipped with the apparatus and method"

In control apparatus and method for controlling an inter-vehicle distance to another vehicle traveling ahead of the vehicle, an inter-vehicle distance from the vehicle to another vehicle running on a traffic lane at the detected inter-vehicle distance from the vehicle is detected through an inter-vehicle distance detector, a follow-up running control for the vehicle is performed by a vehicular running controller such that the vehicle runs behind the other vehicle, maintaining a predetermined inter-vehicle distance to the other vehicle, and a vehicular velocity variation inhibit command is generated and outputted to the vehicular running controller to maintain a vehicular running state immediately before the inter-vehicle distance detector changes from a first state in which the inter-vehicle distance to the other vehicle is being detected into a second state in which the inter-vehicle distance becomes indetectable is continued for a duration of time until the vehicle passes the traffic lane by the inter-vehicle distance immediately before the inter-vehicle distance detector changes from the first state into the second state. [A2668]

"System for providing Geolocation of a mobile transceiver"

A method and means for locating a transceiver remote from a base station operating in a spread spectrum mode, including determining the angle of arrival of a remote emission from the transceiver and the range of the remote emission and then calculating the geolocation of the remote transceiver therefrom. [A2669]

"Methods for modulating a radiation signal"

A reflector having a mechanically deformable portion of at least one reflective surface is disclosed. By deforming the portion of the reflective surface, discontinuity is introduced in that portion of the reflective surface. The discontinuity in the reflective surface scatters incident radiation signals so as to cause attenuation in the reflected signal. By selectively deforming the portion of the reflective surface, the reflected signal can be modulated to encode data thereon. The mechanically deformable portion of the reflective surface preferably comprises plates integrally formed therein. [A2670]

"Method for detecting a target by means of a high pulse repetition frequency radar system"

The invention particularly relates to the detection of fast-flying targets by means of an HPRF radar system that operates with a plurality of switchable pulse-repetition frequencies (PRFs) . In the method, a high velocity resolution is attained, which permits a reliable detection of a multiple-target situation. At the same time, a precise range determination is attained with a high range resolution by means of a pure transit-time measurement of the pulses. The length of the used range gates is selected to correspond to the anticipated target length. [A2671]

"Vehicle speed detection system"

Correction for compensating for errors caused by the pitching movement of a vehicle is executed with high accuracy at low cost. The ground speed of the vehicle sensed by a Doppler sensor is corrected with angular velocities with respect to the center of gravity of the vehicle. In this correction, the center of rotation of the vehicle and the rotation of the Doppler sensor itself during the pitching movement of the vehicle are taken into account. In order to mount the Doppler sensor at a high level in the vehicle without increasing the output power of the sensor, arrangement is made such that the relationship between the difference between the actual installation level of the Doppler sensor and a reference installation level and the amount of correction of beam depression angle is stored in a look-up table, the beam depression angle corresponding to the actual installation level of the Doppler sensor is calculated through correction with the corresponding correction amount of the table, and the sensed ground speed of the vehicle is corrected with the calculated beam depression angle. [A2672]

"Method and device for determining the probable path to be covered by a vehicle"

A method and a device for determining a future travel-course progression or travel-course range of a vehicle whose traveling speed is controllable as a function of a distance to preceding-traveling vehicles, the future course range being determined at least on the basis of a course progression of one preceding-traveling vehicle. Moreover, a lateral offset is determined for all detected preceding-traveling vehicles. The determined future course range is limited on the basis of detected stationary objects. [A2673]

"Receiver system"

The invention relates to a receiver system for the reception of a series of ultrashort, pulsed electromagnetic signals. Signals of this type usually require an extremely fast-acting receiver, necessarily situated in close proximity to the antenna. According to the invention, the presence of several passive components near the antenna will suffice. [A2674]

"Object detecting device"

An area is divided by a plurality of parallel lines parallel to a vehicle body axis CL of a vehicle V, into fifteen detection areas K1 to K15 each having a width of 1.6 m, and each of the detection areas K1 to K15 is divided by a distance address at a distance of every 0.5 m to define a large number of measure-shaped regions. It is determined whether a target T exists in any of the regions, by adding together received reception level signals of laser beams reflected in the regions and comparing a value resulting from the adding with a threshold value. The widths of the detection areas K1 to K15 assume a constant value irrespective of distance to the target and hence, even when the target T exists at a point closer to the vehicle, the reception level signals of waves reflected from a wider area of the target T can be added together, leading to an enhanced detecting ability. [A2675]

"Sensor mounting"

A mounting for attaching a sensor (10) in a vehicle bumper comprises a housing (12) within which a sensor holder (14) can be angularly adjusted. The sensor holder (14) has a part-spherical surface which is biased against a part-spherical seat (22) within the housing (12) by means of a spring (28) acting through a bearing rest (26) and a bearing cup (24) , these parts being retained within the housing (12) by a thrust washer (30) and a retaining clip (32) . [A2676]

"Surroundings monitoring apparatus for an automotive vehicle"

A surroundings monitoring apparatus for an automotive vehicle, which may readily predict a road geography such as a road radius only by lane information of a vehicle and a relative position, includes a radar head 1 for detecting objects that are present around the subject vehicle and for outputting the positional information of the objects in a predetermined detection coordinate system, a vehicle identifying device (step S3) for classifying the vehicles travelling along the road and objects other than the vehicles out of the objects and a road geography prediction device (step S4) for predicting the road geography based upon the position of the travelling vehicles and the lane information in accordance with an output of the radar head and an output of the vehicle identifying device (step S3) . [A2677]

"Motor vehicle warning and control system and method"

A system and method assist the driver of a motor vehicle in preventing accidents or minimizing the effects of same. In one form, a television camera is mounted on a vehicle and scans the roadway ahead of the vehicle as the vehicle travels. Continuously generated video picture signals output by the camera are electronically processed and analyzed by an image analyzing computer, which generates codes, that serve to identify obstacles. A decision computer mounted in the controlled vehicle receives such code signals along with code signals generated by the speedometer or one or more sensors sensing steering mechanism operation and generates control signals. Such code signals maybe displayed, and as synthetic speech or special sound generating and warning means used to warn the driver of the vehicle of approaching and existing hazards. The system may also use the control signals, particularly through application of fuzzy logic, to control the operation of the brakes and steering mechanism of the vehicle to avoid or lessen the effects of a collision. In a particular form, the decision computer may select the evasive action taken from a number of choices, depending on whether and where the detection device senses other vehicles or obstacles. [A2678]

"Method for vehicle data dependent range measurement from a vehicle"

The invention concerns an ultrasound parking aid system which emits warning signals when an echo signal lying within an audibility window exceeds a given threshold value. Hitherto, an audibility window or the sensitivity of the system was adapted to fixed data of the vehicle and/or the roadway. According to the invention, the sensitivity, audibility window or even the emission response is adapted as a function of varying dynamic data of the vehicle or roadway. [A2679]

"Registration method for multiple sensor radar"

The invention is a method for radar registration by determining initially unknown azimuth and range biases (errors) in a system of multiple, overlapping coverage radars. Track data from multiple radar systems corresponding to a common target are associated into track pairs. Track pair data is then used to calculate state vectors in a multi-dimensional vector space (preferably six-dimensional) , with state vector components corresponding to both position and velocity information. From these state vectors an average normalized statistical distance is calculated, where the averaging is over multiple track pairs. An azimuthal bias parameter (and preferably also a range bias parameter) are then varied to minimize the average normalized statistical distance, thereby finding the best estimates of the corrections required to register the multiple radars. [A2680]

"Swept-step radar system and detection method using same"

An apparatus and method for detecting an object and determining the range of the object is disclosed. A transmitter, coupled to an antenna, transmits a frequency-modulated probe signal at each of a number of center frequency intervals or steps. A receiver, coupled to the antenna when operating in a monostatic mode or, alternatively, to a separate antenna when operating in a bistatic mode, receives a return signal from a target object resulting from the probe signal. Magnitude and phase information corresponding to the object are measured and stored in a memory at each of the center frequency steps. The range to the object is determined using the magnitude and phase information stored in the memory. The present invention provides for high-resolution probing and object detection in short-range applications. The present invention has a wide range of applications including high- resolution probing of geophysical surfaces and ground- penetration applications. The invention may also be used to measure the relative permittivity of materials. [A2681]

"Wide-angle, static and positional anticipatory object detection system"

A wide angle, static, positional anticipatory object detection system includes a transducer device for transmitting a modulated carrier signal and receiving the modulated carrier signal reflected from an object, a detection device for detecting a plurality of Doppler shifted harmonic components from the reflected modulated carrier signal, a range determining device responsive to the amplitudes of at least two of the harmonic components being equal for determining the instantaneous range of the object and, a predetermined distance thereafter, to a predetermined difference between the amplitudes of at least two of the harmonic components. The system also includes a Doppler period measurement device responsive to at least one of the harmonic components for measuring the Doppler periods of that harmonic component and a collision decision device, responsive to the range determining device and the Doppler period measurement device, for indicating that a collision with the object is imminent and the offset of the collision from the detection device before contact is made. [A2682]

"Method of manufacturing an enclosed transceiver"

The present invention teaches a method of manufacturing an enclosed transceiver, such as a radio frequency identification ("RFID") tag. Structurally, in one embodiment, the tag comprises an integrated circuit (IC) chip, and an RF antenna mounted on a thin film substrate powered by a thin film battery. A variety of antenna geometries are compatible with the above tag construction. These include monopole antennas, dipole antennas, dual dipole antennas, a combination of dipole and loop antennas. Further, in another embodiment, the antennas are positioned either within the plane of the thin film battery or superjacent to the thin film battery. [A2683]

"Vehicle position determination system and method"

A vehicle position determination system for determining the position of a moving vehicle having a transponder includes a first and second antennas operable to receive periodic radio frequency data signals from the transponder when the transponder is moving through a first or second predetermined coverage zone, respectively. The first and second coverage zones partially overlap and each have a width that is orthogonal to the travel path of the moving vehicle and a length that is parallel to the travel path of the moving vehicle. A processor counts the number of periodic data signals received by each of the antennas from the transponder during a time period and determines based on the count a probable location of the vehicle. The vehicle location information can be provided to an imaging system to discriminate between transponder and non-transponder equipped vehicles. [A2684]

"Radar device for vehicle"

A radar device for vehicle comprising a means for transmitting electromagnetic waves, a means for receiving the electromagnetic waves reflected by a target object, a signal processing means for obtaining a range, a relative velocity, and receipt intensity of the target object based on an output from the transmitting means and an input in the receiving means, a scanning means for changing directions of transmitting and receiving the electromagnetic waves, and an operating means for calculating a direction of the target object based on the receiving intensity of the target object in a plurality of directions, wherein the amounts of AGC in the receiving means in the plurality of directions are independently controlled, whereby a maximum detectable range as an inherent performance of radar is not deteriorated under any driving situation and a position of the preceding vehicle is securely detected. [A2685]

"Wide area time domain radar array"

A system and method for high resolution radar imaging using a sparse array of time modulated ultra wideband (TM-UWB) radars. Two or more TM-UWB radars are arranged in a sparse array. Each TM-UWB radar transmits ultra wideband pulses that illuminate a target, and at least one receives the signal returns. The signal return data is processed according to the function being performed, such as imaging or motion detection. The TM-UWB radar array operates in several modes. In a first mode, each TM-UWB radar transmits and receives back scattering returns, and at least one TM-UWB radar receives forward scattering returns. In a second mode, each TM-UWB radar transmits but only one of the radars receives signal returns, both back and forward scattering. In a third mode, each TM-UWB radar transmits and receives back scattering signal returns, but neither receives forward scattering returns. TM-UWB radios can be used to perform other functions, such as handling communications between the radars and determining the distance separating one radar from another. [A2686]

"Electromagnetically coupling nonradiative dielectric waveguides"

A device with a nonradiative dielectric waveguide which operates in a microwave band or in a millimeter wave band. The device with a nonradiative dielectric waveguide is, for example, an oscillator, a circulator, a coupler or the like. The device has a pair of parallel conductors, a dielectric strip which is disposed between the conductors and propagates a high-frequency electromagnetic wave in a specified mode, a mounting surface which is formed on one of the conductors, and an end surface which is defined by an end of each of the conductors so as to be vertical to a traveling direction of the electromagnetic wave propagated in the dielectric strip. An end of the dielectric strip is exposed at a corresponding end surface of the device. [A2687]

"Method and apparatus for controller power train of motor vehicle"

The vehicle power train control method and apparatus according to the invention secures both operability and safety by controlling an actual acceleration/deceleration to a target acceleration/deceleration requested by a driver under safe traveling condition, and changing the target acceleration/deceleration so as to take precedence for safe traveling if the driver encounters a dangerous traveling condition. According to the invention, acceleration/deceleration and speed of a motor vehicle are detected, a target acceleration/deceleration is determined, and a road condition such as a road gradient or presence or absence of a forward motor vehicle is detected to decide whether the road condition is dangerous. The target acceleration is changed if the condition is decided to be dangerous. [A2688]

"Vehicle radar system"

A radar system adapted to be installed on a vehicle (1) is operable to detect objects in different fields of view of the system. The system has transceiver means (2, 3, 44, 46) for transmitting a radar signal and receiving the signal after the latter has been reflected from an object to be detected. A reflected signal is sampled by sampling means (12, 66) during a succession of sampling periods each of which is delayed with respect to a corresponding portion of the transmitted signal. The gating of the reflected signal effectively generates range shells, each of which corresponds to the time taken for a transmitted signal to reach an object at the shell, and to be reflected back to the system and is hence related to the delay between the transmission of the signal and the corresponding sampling period. The range shells define the field of view of the system, which can be changed by altering said delay. Such alterations are carried out under the control of control means which is connected to sensor means for detecting a property of the operation of the vehicle, determining a required position of the field of view, and setting the field of view of the system accordingly. The range shell positions, and hence fields of view, can also be changed by selecting alternative transmitters and/or receivers of the transceiver means. There is also shown a motor road vehicle which has a radar system comprising a pair of transmitter antennas at two alternate corner regions of the vehicle and a pair of cooperating receiver antennas of the other two corner regions. Certain embodiments of the system also have the facility to generate range shells which are swept over an area around the vehicle or which track detected objects. [A2689]

"Parking aid for a motor vehicle having sensors with substantially the same detection area"

A parking aid for a motor vehicle, which measures the distance between an object and the motor vehicle in a contactless manner and has a plurality of sensors which are arranged on the motor vehicle, each sensor emitting a signal and receiving the signal reflected from an object located in the direction of the beam, and an evaluation device connected to the sensors determining the distance between the object and the motor vehicle from the signals received. The outlay for electrically synchronizing the sensors is reduced and which nevertheless allows reliable detection of the actual object for accurate measurement of the distance, has three sensors which are arranged directly next to one another to provide approximate coverage of the same detection area, whereby the main beam of each sensor having approximately the same beam angle. [A2690]

"Dynamic optimal sensor employment for searching an area"

A dynamic optimal sensor employment system and method is used for searching an area. Each time the sensor in the search vehicle is activated, the dynamic optimal sensor employment system ("the system") determines which areas were searched at that moment. It does this by using a terrain database, information about the sensor state when it scanned (azimuth, elevation, mode, etc.) , and a line-of-sight algorithm. The system determines this instantaneous coverage not only for the primary search vehicle, designated "ownership", but also for other teammates who report scan information to ownship via digital messages. The system maintains a dynamic history of all areas (e.g. 30 meter by 30 meter square "cells" of ground) that have been searched. Each cell has a counter that indicates how many time it has been scanned, and each time cells are scanned with ownship or team sensors the counter is incremented. Cells that are too steep or otherwise non-trafficable by a land vehicle, such as a lake or a river, are marked ahead of time to indicate there is no need to search them. The system then dynamically determines what sensor activations are required to search the areas that are known to be trafficable but have not yet been scanned by ownship or teammates. Specifically, it determines the time, location, direction, field-of-view, and altitude that best satisfy an optimization criteria, and then automatically activates the sensor to generate this coverage. [A2691]

"Method and system for controlling vehicle speed based on vehicle yaw rate and yaw acceleration"

In an adaptive speed control system for a vehicle, a method and system are provided for controlling a speed of the vehicle while the vehicle is traversing a curved path. The method includes sensing a yaw rate of the vehicle, determining a yaw acceleration based on the yaw rate, and determining a maximum allowed speed of the vehicle on the curved path based on the yaw rate and the yaw acceleration, the maximum allowed speed being capable of varying continuously. The method also includes limiting the speed of the vehicle on the curved path to a value no greater than the maximum allowed vehicle speed. The system includes a sensor capable of sensing a yaw rate of the vehicle, and a controller capable of determining a yaw acceleration based on the yaw rate, and capable of determining a maximum allowed speed of the vehicle on the curved path based on the yaw rate and the yaw acceleration, the maximum allowed speed being capable of varying continuously. The controller of the system is also capable of limiting the speed of the vehicle on the curved path to a value no greater than the maximum allowed vehicle speed. [A2692]

"Parking aid"

The device has a transmitting and receiving device for electromagnetic radiation which is arranged in the region of a bumper and includes an RF circuit arranged on a support plate and at least two substantially planar antennas that interact with the RF circuit. The antennas are fixed on a plastic sheet. A printed circuit board has perforations for the passage of radiation from the RF circuit to the antennas. Spacers having a precise longitudinal extent are inserted into the perforations, and the plastic sheet is bonded onto the underside of the printed circuit board such that the antennas each bear on a spacer. [A2693]

"Vehicle safety sensor"

A vehicle safety sensor allows a vehicle operator such as a truck driver to detect the presence of adjacent objects in order to avoid collision with same. In one embodiment, three detection ranges providing feedback with various lights and sounds can be used with separate sensors, with some sensors automatically made "live" upon reversing or turning of the vehicle, and some sensors being manually activated, such as when a overpass is encountered. [A2694]

"Side impact airbag systems"

A variable inflation rate inflator system for inflating one or more airbags including an inflator for releasing a gas into the airbag (s) , a first anticipatory crash sensor for determining that a crash requiring an airbag will occur based on data obtained prior to the crash and, upon the making of such a determination, triggering the inflator means to release gas into the airbag (s) to thereby inflate the same at a first inflation rate, and a second crash sensor for determining that a crash requiring an airbag will occur or is occurring and, upon the making of such a determination, affecting the inflator such that an additional quantity of gas is released thereby into the airbag (s) to thereby inflate the airbag (s) at a second inflation rate greater than the first inflation rate. Also, an airbag passive restraint system for protecting an occupant sitting in the seat adjacent the side door is disclosed including at least one airbag arranged to be inflated between the occupant and the side door, a sensor for detecting that a crash requiring deployment of the airbag (s) is required, an inflator for releasing a gas into the airbag (s) to inflate the same and which is triggered by the sensor to release gas into the airbag (s) in response to the detection by the sensor of a crash requiring deployment of the airbag (s) , and a system for permitting the occupant to be displaced away from the side door upon inflation of the airbag (s) and thereby increase the space between the occupant and the side door. [A2695]

"Method for discovering the location of a living object and microwave location device for realizing the same"

The method includes radiating an RF signal within a time Tt, receiving a reflected signal within a fixed time Tr equal in duration to the fixed time Tt of the radiated signal plus a delay .tau..sub.d between the end of the signal radiation and the beginning of the reflected signal reception. Once a modulated component is detected, a level of the component is measured and the reception time of the reflected signal is modified. This is carried out until the level of the modulated component decreases relative to that of the initially reflected RF signal and until the signal stops coming in. A distance is further determined from the reception time of the reflected signal with the modulated component. The method can be implemented using a microwave locator comprising a modulator and a transmitter which includes an oscillator, a power splitter and a transmitting antenna. A receiver comprises a receiving antenna, a microwave receiver, a preamplifier/demodulator and a signal processing unit. The modulator is tunable. The apparatus further includes a first pulse modulator in the transmitter and a second pulse modulator in the microwave receiver. The modulator has a control output which is connected to a control input of the second pulse modulator so that the receiver receives the reflected signal with a delay relative to the end of the signal radiation by the transmitter, and the enable time of the microwave receiver is modified. The signal processing unit measures a level of the modulated component. [A2696]

"Quick response perimeter intrusion detection sensor"

An Ultra Wideband (UWB) short-range radar system is used for the detection of targets in clutter. Examples of targets on the ground include human walkers, crawlers and runners, and vehicles. The UWB sensor can also be used to detect small approaching boats in different levels of sea clutter or airborne targets like hang gliders. One of the primary differences between this device and other UWB radar sensors is the manner in which the bias on the threshold detector is set as well as the logic circuitry used to find targets in clutter while maintaining a low false alarm rate. The processing is designed to detect targets in varying degrees of clutter automatically. There may be no front panel controls other than an ON-OFF switch. The system is lightweight, low-cost, and can be easily installed in minutes. [A2697]

"Apparatus for magnetically decoupling an RFID tag"

A resonant circuit tag includes an integrated circuit for storing data and an antenna circuit for generating a first local field and resonating at a first predetermined radio frequency. A second circuit including an inductive coil selectively generates a second local field such that a sum of the first and second local fields approaches zero. The second circuit thus allows the resonant tag to be selectively decoupled from its environment. [A2698]

"Method for determining object movement data"

The velocity vector of a moving object is precisely determined by using radar measurements of the angle to and the radial speed of a moving object. This can be done in a radar system comprising one or more units. The technique also makes it possible to precisely determine the range to a moving object from a single moving radar unit. [A2699]

"Apparatus for detecting relative velocity"

In order to produce relative velocity signals in accordance with the relative velocity between a following and a preceding vehicle, a Doppler signal transmitter, which targets the preceding vehicle, is attached to the following vehicle. The thus obtained Doppler signals impinge on a signal processor which analyzes the frequency spectrum of the Doppler signal. Velocity signals are formed from the frequencies within this frequency spectrum, which frequencies lie outside the range of those frequencies caused by the velocity of the following vehicle moving relative to the surface. [A2700]

"Method of detecting relative direction of motion of a radio frequency (RF) tag"

A method of determining relative motion between a base station and an RF Tag is disclosed, wherein a property of the RF field at the position of the tag is determined at a first time and at a second time and is used to calculate the relative motion. [A2701]

"Automatic curve sensor calibration method for an automotive CW/ICC system"

An improved system for accurately determining the travel path of a host vehicle and the azimuth angle of a target vehicle through an automatic calibration that detects and compensates for FLS mis-alignment and curve sensor drift. Selected FLS tracking data (range and azimuth angle) are transformed to cartesian coordinates and characterized by a second order curve fitting technique to determine both FLS misalignment and curve sensor bias. Successively determined FLS misalignment and curve sensor bias values are averaged and used to correct subsequently supplied azimuth angle and curve sensor data, thereby compensating an underlying control for both sensor misalignment and curve sensor bias. [A2702]

"Method and apparatus for detecting road circumstances around a traveling vehicle and a recording medium for storing a related software program"

The present position of a previously recognized stationary object group (SOp) is estimated based on past position data and the movement of the traveling vehicle during a past time (.DELTA.T) . A clearance (Mwr, Mwl) between a traveling vehicle (Mx) and an adjacent stationary object group (Mxr, Mxl) is obtained based on the estimated position data. A clearance (Twr, Twl) between a preceding vehicle (Tx) and an adjacent stationary object group (Txr, Txl) is obtained based on the estimated position data and the position data of the preceding vehicle. A same lane judgement is performed to judge whether the traveling vehicle (VM) and the preceding vehicle (VT) are traveling on a same traffic lane based on at least one of the detected clearances (Mwr, Mwl, Twr, Twl) . [A2703]

"Pulse doppler target detecting device"

A target detection device of the electromagnetic transmitter-receiver reaction type comprising a radio frequency oscillator which is integral with its radiating system and detector. It incorporates a pulse modulator which drives the oscillator to periods of high power transmission and a signal processing system to reject unwanted data and to effect detonation of the warhead at the optimum point on its trajectory. [A2704]

"Vehicle rearview mirror display system"

A vehicle blind spot detection display system displays indications from a blind spot detector. The system includes a first indicator assembly positioned on the vehicle in the vicinity of an exterior mirror and adapted to producing an indication at least of the presence of an object adjacent the corresponding side of the vehicle. A second indicator assembly is provided on the vehicle interior mirror assembly and adapted to producing an indication at least of the presence of an object adjacent the same corresponding side of the vehicle. In this manner, redundant indications are provided at both the interior and exterior mirrors in order to assist the driver in a premaneuver evaluation of conditions surrounding the vehicle. [A2705]

"Excavator data acquisition and control system and process"

An excavator data acquisition and control system and process for characterizing the subsurface geology of an excavation site, and for utilizing the acquired data to optimize the production performance of an excavator. A geologic imaging system and a geographic positioning system are employed to initially survey a predetermined excavation site or route. A geologic characterization unit may also be employed to enhance the geologic imaging data. The acquired data are processed to provide detailed geologic and position data for the excavation site and utilized by a main control unit to optimize excavator production performance. In one embodiment, the main control unit accesses a geologic filter database, which includes geologic profile data for numerous types of geology, when analyzing unknown subsurface geology. Removing geological filter data content corresponding to known geology from the acquired geologic imaging data provides for immediate recognition of unknown and suspect subsurface objects. The geologic imaging system preferably includes a ground penetrating radar system having a plurality of antennas oriented in an orthogonal relationship to provide three-dimensional imaging of subsurface geology. [A2706]

"Run environment recognizing apparatus"

Described herein is a run environment recognizing apparatus. The run environment recognizing apparatus comprises an imaging device for sensing the direction of traveling of a host vehicle as imaging vision, a radar for detecting the direction of traveling of the host vehicle as a detection range, an image processing device for recognizing traveling lanes, leading vehicles and stationary objects located ahead of the host vehicle, based on the image information sensed by the imaging device and the result of detection by the radar, and a display for displaying the results of recognition by the image processing device. The image processing device includes means for setting vehicle regions indicative of the leading vehicles within the image information, based on the result of detection by the radar. Thus, the influence of the leading vehicles in the process for recognizing the traveling lanes within the image information is eliminated by the vehicle regions. [A2707]

"Spatial interferometry"

An interferometer comprises a non-uniform beam splitter (34) which splits an incoming beam (30) of energy into two beams (36, 38) . The two beams (36, 38) are taken from parts of the incoming beam (30) which overlap. The two beams (36, 38) are fed spacially separated energy feeds (44, 46) and then fed to a comparator to produce sum and difference channels (54, 58) . The sum and difference channels (54, 58) are guided to a means for detecting a difference in phase (60) between the sum and difference channels (54, 58) . [A2708]

"Radar ice sounder with parallel doppler processing"

A radar ice sounder which employs parallel Doppler processing obtains more reliable and accurate radar ice sounding. The invention uses both incoherent and coherent techniques, in the same paradigm, to achieve simultaneously high Signal-to-Noise Ratio, high Signal-to-Speckle standard deviation Ratio, and high Signal-to-Clutter Ratio. [A2709]

"Method of operating a multi-antenna pulsed radar system"

A method for operating a radar system using at least two antennas provides an increased angular resolution for determining the angular position, radial velocity, and/or distance to a reflection object. A plurality of successive measuring phases are carried out in at least one measuring process. In each measuring phase, operation is repeatedly switched between a transmitting operation in which a transmitted signal pulse is emitted, and a receiving operation in which reflection signals are detected as received signals in the pulse pause interval between successive transmitted pulses. In at least one measuring phase, two different neighboring antennas of the radar system are used respectively as the transmitting antenna for emitting the transmitted signal and as the receiving antenna for detecting the reflected signal. In this manner, the respective receiving antenna monitors only the angular range of overlap between the emitted beam of the transmitting antenna and the field of view of the receiving antenna. The information provided by the detected signals in this overlapping angular range achieves an increased angular resolution. The method is particularly suitable for operating a separation distance warning system for a motor vehicle. [A2710]

"System and method for intrusion detection using a time domain radar array"

A system and method for highly selective intrusion detection using a sparse array of time modulated ultra wideband (TM-UWB) radars. Two or more TM-UWB radars are arranged in a sparse array around the perimeter of a building. Each TM-UWB radar transmits ultra wideband pulses that illuminate the building and the surrounding area. Signal return data is processed to determine, among other things, whether an alarm condition has been triggered. High resolution radar images are formed that give an accurate picture of the inside of the building and the surrounding area. This image is used to detect motion in a highly selective manner and to track moving objects within the building and the surrounding area. Motion can be distinguished based on criteria appropriate to the environment in which the intrusion detection system operates. [A2711]

"Method for determining a desired response to detection of an obstacle"

A method is disclosed for responding to the detection of an obstacle in the path of a mobile machine as the mobile machine traverses the path at a work site. The method includes the steps of scanning a field of interest, detecting the presence of an obstacle, and determining a set of parameters as a function of the mobile machine, the obstacle, and the work site. The method also includes the steps of determining a level of predictability of motion of the obstacle, defining ranges of a plurality of zones as a function of the level of predictability and the parameters, and initiating an action in response to the obstacle being in one of the zones. [A2712]

"Enhanced range transponder system"

An identification and telemetry system including an interrogator (1) containing an interrogator antenna (2) for generating at an interrogation frequency, an interrogtion signal. The interrogation signal is adapted to excite over an electromagnetic coupling path (M1) at least one coded label (3) containing a label antenna (4) and a label microcircuit (5) . The coded label is adapted to extract energy from the label antenna and to generate a label reply signal. The label reply signal is adapted to be conveyed to a label reply antenna and, via an electromagnetic coupling path, to a receiver in the interrogator. The label antenna is placed in proximity to a further antenna (6) being a parasitic antenna coupled electromagnetically (M2, M3) with the interrogator antenna and with the label antenna so as to enhance transfer of power between the interrogator and the coded label. [A2713]

"Transponder communication of ORVR presence"

The present invention provides a fuel delivery system capable of controlling a fuel dispenser's vapor recovery system based on the absence or presence of an on-board vapor recovery system on the vehicle. This system includes a fuel dispenser having a vapor recovery system, a controller capable of controlling the vapor recovery system, a receiver and an antenna operating in conjunction with the receiver to receive a signal emitted from a transponder on a vehicle indicative of the absence or presence of an on-board vapor recovery system, in addition to a type of vehicle tank or characteristic thereof. When the controller determines from the transponder signal information relating to on-board vapor recovery and/or tank characteristics, the controller will control its vapor recovery system accordingly. [A2714]

"Focused narrow beam communication system"

A system for establishing and utilizing a wireless communication system using a lens antenna having a dielectric material lens. The lens focuses output radio frequency (rf) signals into narrow beam rf signals which are directed to a specific receiving communication device. The lens focuses input rf signals onto signal processing equipment. A communication system between two or more communication devices which utilizes a dielectric material lens and signal processing equipment can be used for point-to-point or point-to-multipoint communication. [A2715]

"Object recognizing apparatus for vehicle and the method thereof"

A stereoscopic optical system images a stereoscopic picture image, a stereoscopic image processing section calculates a three-dimensional distance distribution from the stereoscopic picture image, and an object recognizing section recognizes objects from the distance distribution information to calculate a relative position of the objects with respect to the vehicle. On the other hand, a travelling amount of the vehicle is detected by a steering sensor and a rear wheel rotation sensor. Then, an object positional information calculating section calcuLates a new relative position of the objects based on the relative position information memorized in a memory section and the calculated travelling amount of the vehicle and the memory section memorizes the new positional information. And, a bumping judgment outputting section judges the possibility of bumping against the objects based on the new relative position of the objects with reference to memorized information about the external shape of the vehicle. If it is judged therein that there is a possibility of bumping, the bumping judgment outputting section outputs a warning signal to an indicating section. [A2716]

"Vehicle control system having obstacle detector"

A vehicle control system having a laser radar for detecting an obstacle present ahead on a course of travel of the vehicle, and control device for operating a brake or an alarm based on an output of the laser radar when a distance from the vehicle to the obstacle is less than a first predetermined value or is less than a third predetermined value. In the system, a millimeter-wave radar, which is inferior to the laser radar in position detection accuracy, but is superior in weather-proof operation, is provided. When the laser radar is inoperative, the control device operates the brake or alarm based on the output of the millimeter-wave radar when the distance is less than a second predetermined value (less than the first predetermined value) or is less than a forth predetermined value (greater than the third predetermined value) , thereby expediting the alarm initiation to alert the vehicle driver at an appropriate time, while ensuring the proper brake initiation, so as not to cause the vehicle driver to experience annoyance. [A2717]

"Methods and arrangements for controlling an occupant restraint device in a vehicle"

Arrangements and method for controlling a deployable occupant restraint device in vehicle, such as an airbag, in which a crash sensor determines whether deployment of the occupant restraint device is required as a result of the crash and an occupant position sensor determines the position of the occupant. Deployment of the occupant restraint device is controlled based on the determination by the crash sensor if deployment of the occupant restraint device is required and the position of the occupant. The position of the occupant is determined preferably by ascertaining the position of the seat or a part thereof, e.g., the seat portion or back portion, relative to a fixed point of reference to thereby enable an approximation of the position of the occupant to be obtained. The payout of a seatbelt from a seatbelt retractor can also be measured and used to better provide the actual position of the occupant. An additional approximation of the position of the occupant can be obtained by receiving waves from the space above the seat in order to improve the determination of the likely, actual position of the occupant. [A2718]

"Arrangement and method for detecting objects from a motor vehicle"

A motor vehicle object-detecting arrangement includes a distance controller having a distance-sensing device for emitting and receiving object-reflected measuring beams in different directions and having an evaluation unit. The measuring beams received by the distance-sensing device are appraised as a function of the geometry of the road on which the vehicle is being driven. for this purpose an appraisal device receives information from the distance sensing device and from a transmitter unit which supplies information on the road geometry of the road. The appraisal device appraises the measuring beams reflected from different directions as a function of the information on the road geometry. [A2719]

"System and method for detecting and displaying wind shear"

A computer based method of detecting and displaying rotational wind shear. Radial wind velocities within first and second adjacent gate sweeps produced by a radar system are detected in a predetermined geographic area, and are compared at points of equal radial distance from the radar system. The radial location of gate to gate wind shear at positions between the radar system and the boundary of the radar systems range are identified and compared to a predetermined threshold wind velocity value to determine the location of high priority gate to gate wind shear. The high priority gate to gate wind shear is then graphically displayed relative to its geographic location on a graphical representation of the predetermined geographic area. A computer based system for detecting and displaying rotational wind shear is also disclosed. [A2720]

"Device for detecting obstacles, for use in vehicles"

A device for detecting obstacles, for use in vehicles, capable of correctly detecting obstacles without driving up the cost. the device includes a signal processing device 3 for detecting an obstacle Z based on reception signals A, B from a plurality of sensor devices 1, 2, wherein the signal processing device includes detection region-setting devices 31, 32 for dividing the region around the vehicle into a plurality of detection regions, probability-of-presence operation devices 33, 34 for operating the in-the-region presence probabilities P, Q of obstacle, a probability distribution operation device 35 for operating the in-the-region presence probabilities for each of the detection regions, and an obstacle detection device 36 for judging the regions S where the obstacles exist based on the in-the-region presence probabilities R in the distribution of presence probabilities, wherein the obstacle detection device judges detection regions exhibiting the in-the-region presence probabilities that are larger than a predetermined threshold value to be the regions where the obstacles exist among the in-the-region presence probabilities in the detection regions in the distribution of presence probabilities. [A2721]

"Apparatus and method for controlling an underground boring tool"

An apparatus and method for determining a location and an orientation of an underground boring tool by employment of a radar-like probe and detection technique. The boring tool is provided with a device which generates a specific signature signal in response to a probe signal transmitted from above the ground. Cooperation between the probe signal transmitter at ground level and the signature signal generating device provided at the underground boring tool results in accurate detection of the boring tool location and, if desired, orientation, despite the presence of a large background signal. Precision detection of the boring tool location and orientation enables the operator to accurately locate the boring tool during operation and, if provided with a directional capacity, avoid buried obstacles such as utilities and other hazards. The signature signal produced by the boring tool may be generated either passively or actively, and may be a microwave or an acoustic signal. Further, the signature signal may be produced in a manner which differs from that used to produce the probe signal in one or more ways, including timing, frequency content, information content, or polarization. [A2722]

"Lens arrangement suited for focusing radar waves"

In a lens arrangement for collimating radar waves for distance sensors, in particular for motor vehicles, several sublenses are arranged integrally next to one another. A lobe enlargement necessary for angular analysis is thereby achieved. The range is only slightly reduced as compared to a lens having a surface area of the same size. [A2723]

"Vehicle data acquisition system"

A data acquisition system is disclosed where a first communication device transmits a transmitted signal to a second communication device. The second communication device encodes the transmitted signal with a code generating a retransmitted signal. The retransmitted signal is then transmitted back to the first communication device. The code can be indicative of an environmental element, such as a traffic sign. The first communication device can determine a distance to the environmental element by monitoring a time for the retransmitted signal to arrive. The first communication device can also encode the transmitted signal with information, such as voice for example. [A2724]

"Super-resolved full aperture scene synthesis using rotating strip aperture image measurements"

A spinning strip aperture imaging radiometer sensor system and data processing method for synthesizing a super-resolved scene estimate (super-resolved scene) from a plurality of image frames acquired by the strip aperture imaging sensor system. One embodiment of the imaging system comprises a rotating strip aperture wide field of view telescope, a two dimensional detector array for detecting images in the focal plane of the telescope, rotation compensation apparatus for preventing rotational smear during the integration time of the detectors, a signal processor for recording a plurality of image frames of a scene that is imaged by the telescope as it rotates around its optical axis, and an estimation processor employing the present method for synthesizing the super-resolved scene estimate from the recorded images. The super-resolved image synthesis method uses a plurality of rotating strip aperture measurements within the strip aperture passband and within the passband of an equivalent bandlimited synthesized full circular aperture to estimate the spatial frequency information outside the total measurement passband, and/or outside the passband of the equivalent bandlimited synthesized full circular aperture, as well as within the equivalent bandlimited passband. Knowledge of the spatial response function of the strip aperture, the spatial response function of the detector array, noise statistics, and the temporal registrations of each of the recorded strip aperture images permits synthesis of the super-resolved full aperture image by the sensor system and image synthesis method. The super-resolved image synthesis method may be employed in the spatial domain, the spatial frequency domain, or both. [A2725]

"Excitation method and ultra-wide bandwidth antenna for ground penetrating radar systems"

A novel method of creating and detecting ultra wide bandwidth signals in a ground penetrating radar context. [A2726]

"Cutting device with elevation regulation"

There is described a cutting device for fabric and similar material which comprises a cutting table on the surface of which a material support is mounted, a cutting tool which is moveable over the table to penetrate and cut material lying on the support, and a control arrangement which measures the distance to the table surface under the support and thereby controls the depth of cutting tool penetration so that it extends a predetermined distance into the support, independently of applied pressure on the cutting tool. [A2727]

"Autonomous vehicle arrangement and method for controlling an autonomous vehicle"

An autonomous vehicle and method for controlling it includes an input unit to receive one or more travel orders, a route planning unit containing at least one position finding device and digital street map, a vehicle path generating a unit, an array of sensors including at least one range sensor for detecting objects and at least one range sensor for detecting the condition features of the route, a collision avoidance unit, a vehicle condition data recognition unit, a vehicle control unit and a unit for controlling the vehicle actuator system based on the signals generated by the vehicle control unit, wherein the array of sensors includes at least two essentially horizontally directed range sensors at the front of the vehicle, at least one range sensor at the rear area of the vehicle, at least one trackable range sensor on the roof of the vehicle and directed at the roadway, ultrasonic sensors and/or microwave radar sensors arranged on each side of the vehicle, and at least one camera located in each of the front and rear areas of the vehicle. [A2728]

"Vehicle operator alert process"

A method is disclosed for analyzing range and range rate data obtained by a vehicle obstacle detection system to determine whether the dynamic situation justifies alerting the vehicle operator of reducing the speed of the vehicle. Assumed values of vehicle and obstacle deceleration are used with known and assumed values of their velocities to calculate limiting warning distances that in turn are used to calculate an estimated warning distance. The estimated distance is compared with the range value as a basis of determining whether an alert is made. [A2729]

"Mobile unit detection system"

A mobile unit detection system or information system in which the existence of a car or other mobile unit which must be paid attention to can be detected only upon receiving a necessary signal. The mobile unit detection system or information system detects a mobile unit through communication between the car and the mobile unit. The car includes a device for judging the operating condition of the car and transmitting a detection signal based on the result. The mobile unit may transmit a response signal upon receiving the detection signal so that the car is able to detect the existence of the mobile unit. [A2730]

"Article tracking system"

System for tracking mobile tags. Cell controllers with multiple antenna modules generate a carrier signal which is received by the tags. Tags shift the frequency of the carrier signal, modulate an identification code onto it, and transmit the resulting tag signal at randomized intervals. The antennas receive and process the response, and determine the presence of the tags by proximity and triangulation. Distance of a tag from an antenna is calculated by measuring the round trip signal time. The cell controllers send data from the antenna to a host computer. The host computer collects the data and resolves them into positional estimates. Data are archived in a data warehouse, such as an SQL Server. [A2731]

"Synthetic aperture processing for diffusion-equation-based target detection"

A method and system for target detection processing transmits energetic pes into a media in which the energetic pulses propagate diffusively. Diffusively propagating reflections of the energetic pulses from a target are transformed into corresponding wave propagating reflections satisfying a conventional wave equation. The wave propagating reflections are then processed in accordance with a synthetic aperture processing technique. [A2732]

"Itinerary monitoring system for storing a plurality of itinerary data points"

Method and apparatus for a base station or interrogator station to monitor the itinerary of one or more vehicles or other movable assets. Each vehicle or other movable object includes a satellite navigation receiver with circuitry for computing the geographic position of the object, and a memory for storing a history of positions computed at a number of different times during the itinerary of the object. Each movable object further includes a radio transceiver which transmits the stored position history to the base station. [A2733]

"Method for estimating gain and phase imbalance using self-calibrating monopulse angle discriminants in a monopulse radar system"

A processing method or algorithm is for use with a monopulse radar system that provides accurate position information in a cross-range direction for ground moving targets detected using the monopulse radar system. The method corrects the phase of each detected moving target on an individual basis, and thus more accurately compensates for the phase error introduced into each target in a random fashion as a result of noise. The direction of angle correction is determined from clutter data. A gain correction factor includes a term for antenna effects to provide for a more accurate gain correction factor calculation. [A2734]

"Passive surface wave sensor which can be wirelessly interrogated"

In a passive surface wave sensor for measured value determination, a measured value is transmitted by radio from a remote measuring location to an interrogation device, which transmits energy by radio to a sensor element as an interrogation pulse. The surface wave sensor is suitable for contactless measured value acquisition. A surface wave configuration is the sensor element and a surface wave reference element is provided for phase discrimination and/or propagation time measurement. As a further development, a sensor operated with chirped transmitting signals and having chirped reflectors is provided, in which the configuration has a reference function in place of the reference element. A sensor constructed in such a way that it has a chirped function has the characteristics of an imminently temperature-compensated sensor for measuring other physical or similar variables. [A2735]

"Process for controlling the operation of a motor vehicle airbag"

The process comprises the determination of the position, particularly the distance between a passenger or driver and the deployment center of the respective airbag and controlling the deactivation of said airbag or a modulation of its deployment as a function of said position or said distance in order to avoid or reduce the risks of accidents due to the inflation of the airbag when the passenger occupies an abnormal position. [A2736]

"Method and apparatus for sensing the orientation of a mechanical actuator"

A system for determining the extended length or orientation of a hydraulic actuator, or of an implement or joint, is disclosed herein. Electromagnetic (EM) bursts such as ultra-wideband or frequency pulses are generated and applied to a transmitter unit attached to a stationary or moveable portion of the actuator. The EM bursts are launched by the transmitter toward a receiver located on the other of the stationary or moveable portion of the actuator. The time for the EM bursts to travel between the associated antennas of the transmitter and the receiver is determined and converted into a position signal representing the distance therebetween. [A2737]

"Antenna system"

A multiface phased array antenna, with each antenna face being provided with a plurality of T/R modules. To preclude the occurrence of crosstalk among the different antenna faces, caused by the steep edges of transmitted RF pulses, these pulses are delayed per T/R module with a delay selected from a predetermined time interval. [A2738]

"Radar device"

A radar device for detecting distances and relative speeds of obstructions such as preceding vehicles has a stationary object identifier for identifying stationary objects such as roadside guard rails and the like and a stationary object eliminator for eliminating data identified as pertaining to such stationary objects. The stationary object identifier detects peak densities in a beat spectrum detected as a difference between transmitted and received frequencies of a radar beam modulated to rise and fall in frequency periodically and identifies peak groups having peak densities above a predetermined value as stationary objects. Therefore, it is possible to detect a stationary roadside object on the basis of peak densities. The stationary object eliminator eliminates data of peak groups identified as stationary objects by the stationary object identifier and thereby removes them as objects of combination processing for pairing rise side beat frequencies with fall side beat frequencies. As a result the amount of processing required for this pairing is reduced and the occurrence of wrong pairings is reduced and it is possible to eliminate the unnecessary calculation of distances and relative speeds of roadside objects. [A2739]

"Modulatable reflectors and methods for using same"

A reflector having a mechanically deformable portion of at least one reflective surface is disclosed. By deforming the portion of the reflective surface, discontinuity is introduced in that portion of the reflective surface. The discontinuity in the reflective surface scatters incident radiation signals so as to cause attenuation in the reflected signal. By selectively deforming the portion of the reflective surface, the reflected signal can be modulated to encode data thereon. The mechanically deformable portion of the reflective surface preferably comprises plates integrally formed therein. [A2740]

"Spaceborne scatterometer"

A scatterometer orbiting around the earth globe comprises a single fanbeam radar antenna which is rotated around a vertical axis, at a slow rotation rate. The antenna foot-print sweeps a circular disc. The slow conical sweep combined with the motion of the satellite on which the scatterometer is mounted results in highly overlapping successive sweeps such that an image pixel is revisited many times during an overpass. The pixels in the radial direction are resolved by range-gating the radar echo. The radar operates in the C-band. The scatterometer is intended, in particular, to determine wind speed and direction over the ocean. [A2741]

"System and method for position determination by impulse radio"

A system and a method for position determination by impulse radio using a first transceiver having a first clock providing a first reference signal and a second transceiver placed spaced from the first transceiver. The system determines the position of the second transceiver. The second transceiver has a second clock that provides a second reference signal. A first sequence of pulses are transmitted from the first transceiver. The first sequence of pulses are then received at the second transceiver and the second transceiver is then synchronized with the first sequence of pulses. A second sequence of pulses are transmitted from the second transceiver. The first transceiver receives the second sequence of pulses and the first transceiver is synchronized with the second sequence of pulses. A delayed first reference signal is generated in response to the synchronization with the second sequence of pulses. A time difference between the delayed first reference signal and the first reference signal is then measured. The time difference indicates a total time of flight of the first and second sequence of pulses. The distance between the first and the second transceiver is determined from the time difference. The direction of the second transceiver from the first transceiver is determined using a directional antenna. Finally, the position of the second transceiver is determined using the distance and the direction. [A2742]

"Method for modeling roadway and method for recognizing lane markers based on the same"

A method for modeling a roadway and a method for recognizing lane markers based on the modeling method. The method for recognizing lane markers of roadway for a vehicle by getting image information about the roadway and information about the speed and steering angle using a camera and a sensor attached to the vehicle, includes the steps of modeling the actual roadway on which the vehicle travels, as a structure having a plurality of rectangular plates linked to each other. The modeled plates are overlayed onto the image information about the actual roadway, photographed by the camera, pixels forming the lane markers are extracted, and linear lane marker information is then obtained from the pixels forming the land markers. Then, the linear lane marker information is overlayed onto the modeled plates to recalculate lane marker information using the plates as a frame, and predetermined limitations of the features of the lane markers are applied to the plates onto which the linear lane marker information has been overlayed, to optimize the lane marker information. Then, the roadway on which the vehicle is traveling, is remodeled using the optimized lane marker information, the information about the speed and steering angle of the vehicle measured by the sensor, and the information about the modeled plates, and the position and orientation of the remodeled plates are calculated. Therefore, roadway recognition can be easily achieved using a modeled structure of the roadway, in which a plurality of rectangular plates are linked. Also, the model roadway is repeatedly mapped onto the actual roadway image, so that reliability in recognition of roadway increases. [A2743]

"Meteorological radar precipitation pattern prediction method and apparatus"

Meteorological radar precipitation pattern prediction methods and apparatus are provided, by which operational costs can be reduced, a series of physical processes in a precipitation region and topographical influences can be considered. The main method has the steps of inputting radar images of a precipitation region storing the input radar images as time-series two-dimensional images, calculating various image-feature quantities with respect to two or more of the stored two-dimensional past images, calculating a spatial-temporal transition of the amount of precipitation using an advection-diffusion equation system which indicates various physical effects relating to precipitation phenomena, with the various image-feature quantities as initial values, predicting transition of a pattern with respect to the precipitation region based on results of the calculation, and outputting predicted results as time-series images. Preferably, the advection-diffusion equation system includes time, advection, diffusion, source, sink, and dispersion terms, and a gray-level at each pixel is supplied to the equation as a variable corresponding to an amount of precipitation. If the advection-diffusion equation system includes an advection term which is a product of an advection vector and the first derivative with respect to a gray-level of a relevant pixel in a precipitation pattern, the amount of precipitation is varied according to transition of advection vectors. [A2744]

"Obstruction detecting apparatus"

In the obstruction detection apparatus incorporated in a vehicle (11) , ultrasonic wave transmitter/receiver (16 to 19 171) for changing a combination of transmitting of ultrasonic waves and of receiving of reflected ultrasonic waves, a CPU (20) calculates a distance between the vehicle (11) and an obstruction and stores data corresponding to the calculated distance into the distance table (23) , and the LC display device (27) displays the obstruction on display bars of a lattice shape corresponding to the data stored in the distance table (23) , and a buzzer (26) sounds an alarm for a driver. [A2745]

"Method and apparatus for rejecting rain clutter in a radar system"

A method and apparatus for detecting the presence of objects in a vehicle operator's blind spots. The apparatus comprises a side-facing Doppler radar system using continuous wave (CW) transmission with frequency modulation (FM) operation from a frequency modulation switching technique. The radar system determines the presence, range and closing rate of detected targets. The radar system detects targets even when operated in adverse weather conditions and will not generate false warnings due to rain clutter caused by wet roads and other wet surroundings. The radar system uses ranging techniques to reject false targets that are detected outside of a predetermined target detection zone. In accordance with the present invention, the radar system indicates that a target is detected if and only if any part of the target is within the detection zone and it: (1) remains in front of the antenna for at least TH1 seconds, (2) is at a range between Range.sub.min and Range.sub.max , and (3) is moving faster than Closing-Speed.sub.min relative to the antenna. By rejecting targets that are closer than Range.sub.min feet to the antenna, false alarms due to rain clutter are dramatically reduced. Also, by rejecting targets that are further than Range.sub.max feet from the antenna, the radar system reduces false alarms caused by wet foliage and other wet "non-road" surroundings. In one embodiment, the radar system uses a patch array antenna oriented into a diamond-shape configuration to effectively create a natural linear amplitude taper that aids in rejecting clutter caused by wet road surfaces. [A2746]

"Monitoring mechanism of obstacle detecting apparatus for vehicle"

A monitoring mechanism of an obstacle detecting apparatus for a vehicle can be applied to various kinds of obstacle detecting apparatuses and is preferable for judging whether good or bad. Accordingly, the obstacle detecting apparatus for a vehicle having an outgoing device (51) for outgoing a medium (Lo) to a traveling direction of a vehicle (B) , an incoming device (52) for incoming a reflected medium (Li) from an obstacle (D) and a calculating device (53) for defining an existence of the obstacle (D) on the basis of a difference between the outgoing and incoming mediums (Lo, Li) is provided with a monitoring mechanism (6) comprising a rotating device (61) integrally supporting the outgoing and incoming devices (51, 52) in a freely rotatable manner, a reflecting device (62) reflecting the outgoing medium (Lo) to the incoming device when a rotating angle (.theta.) of the rotating device is within a predetermined angle range (.theta.1 to .theta.2) , a rotating angle detecting device (63) of the rotating device, and a judging device (65) comparing at least one of the incoming medium (Li) and a distances (E) calculated by the calculating device (53) with standards (L1 to L2, E1 to E2) corresponding to the at least one when the rotating angle (.theta.) from the rotating angle detecting device is within a predetermined angle range (.theta.1 to .theta.2) and further judging an abnormality in the obstacle detecting apparatus. [A2747]

"Adjustable shield for vehicle mounted toll collection identifier"

A holder is provided for the reception and selective shielding of an electronic vehicle identifying device conventionally used in conjunction with automatic toll collection. The holder includes a shielding portion which is manually actuated by the vehicle operator when it is desired to permit communication between the signal of the vehicle identifying transponder and an externally located interrogator which ascertains the presence of the vehicle. [A2748]

"System and method for projecting storms using NEXRAD attributes"

The subject invention provides an improved system and method for combining data obtained from the NEXRAD.TM. system of the National Weather Service ("NWS") with geographical and topological data base information to achieve an improved and informative graphical storm-tracking display able to project the movement of a storm with a single user-operation. The method of projecting storm movement includes the following steps: collecting NEXRAD data attributes from a weather data source, calculating storm position using the collected NEXRAD attributes, calculating projected storm movement using the storm position and the collected NEXRAD attributes, displaying a graphic representation of the projected storm movement. [A2749]

"Object detecting system for vehicle"

An object detecting system for a vehicle detects an object based on output data from a distance sensor mounted on the vehicle. The distance sensor is capable of detecting a distance between the subject vehicle and the object along longitudinal and lateral directions of the subject vehicle. The output data from the distance sensor is associated on XY coordinates having a Y axis indicative of the longitudinal direction of the subject vehicle and an X axis indicative of the lateral direction with the respect to the subject vehicle in a coordinate developing device. The number of output data from the distance sensor which are located in a plurality of cells, defined by dividing the XY coordinates at predetermined distances in the X-axis and Y-axis directions and the XY coordinates for every cell, are output as cell information from a cell dividing device. In an object discerning device, the same labels or identifiers are assigned to the cells adjacent to one another, based on the cell information output from the cell dividing device, and barycentric position coordinates for every label are determined. Thus, it is possible to shorten the time required for a proximity determining process, while avoiding a reduction in accuracy of the coordinates of the object. [A2750]

"Radio frequency identification interrogator signal processing system for reading moving transponders"

An RF/ID interrogator recovers a backscattered data signal from a moving RF/ID transponder by combining the received in-phase (I) and quadrature-phase (Q) components of the signal in a manner that cancels out the amplitude nulls and phase reversals caused by movement of the RF/ID transponder. More particularly, the RF/ID interrogator comprises a radio having a transmitter portion to provide an RF carrier signal and a receiver portion to receive the I and Q signals from the RF transponder. A bandpass filter is coupled to the radio to remove direct current (DC) components from the I and Q. A processor coupled to the radio and the filter executes stored instructions to combine the filtered I and Q signals and recover the original backscattered data signal therefrom. In an embodiment of the invention, the processor estimates a phase angle .beta. (t) between the I and Q signals and the RF carrier by calculating an arctangent of a ratio of the filtered Q and I signals. Thereafter, the processor recovers the backscattered data signal by summing a product of the filtered I signal and the cosine of the estimated phase angle .beta. (t) with a product of the filtered Q signal and the sine of the estimated phase angle .beta. (t) . [A2751]

"Method and apparatus for recognizing stationary objects with a moving side-looking radar"

A radar system including a means for distinguishing signals returned from (i.e., reflected by) objects that are stationary with respect to earth (i.e., "stationary objects") from signals returned from objects that are moving along with a host vehicle (i.e., the vehicle upon which the radar system is mounted) . The system includes a radar antenna having a relatively narrow beam width centered at a "squint" angle .theta.. When the antenna is aimed such that the center of the beam is at a squint angle of .theta.=60.degree., the Doppler frequency of signals that are reflected from targets that are stationary along the roadside is significantly higher than the frequency of signals reflected from targets that are in the blind spot to the right-rear of the host vehicle and which are moving along with the host vehicle. [A2752]

"Random noise automotive radar system"

An automotive radar system for use with an automotive control system such as a collision avoidance or smart cruise control system, for example. A wide-bandwidth, random noise signal generated at an RF frequency that is transmitted by a transmitter and reflected from targets in the vicinity of the system. The random noise modulation is sampled prior to transmission in a noise source sampler and this sampled image of the transmitted noise is stored and passed through a series of delay stages that are formed in a correlator. The noise signal reflected from objects is processed by a homodyne receiver and also sampled in a receiver sampler. The noise samples from the signal return are passed to the correlator where they are cross correlated with the delayed images of the transmit noise. The output from the correlator for each unit of delay (range gate) is processed in a digital signal processor to find the range and closing velocity (Doppler frequency) of objects in the field of view. The output (range gate) of the correlator where the delay of the sampled transmit modulation equals the transmit delay of the signal transmitted from the radar system to the object and back, contains the range and closing velocity of the objects. At delays (ranges) where there are no objects to reflect the signal, the outputs of the correlator contain noise. Output signals from the digital signal processor are coupled to the automotive control system which processes the output signals to control the vehicle to avoid collision with the detected targets. [A2753]

"Excavator data acquisition and control system and process"

An excavator data acquisition and control system and process for characterizing the subsurface geology of an excavation site, and for utilizing the acquired data to optimize the production performance of an excavator is disclosed. A geologic imaging system and a geographic positioning system are employed to initially survey a predetermined excavation site or route. A geologic characterization unit may also be employed to enhance the geologic imaging data. The acquired data are processed to provide detailed geologic and position data for the excavation site and utilized by a main control unit to optimize excavator production performance. In one embodiment, the main control unit accesses a geologic filter database, which includes geologic profile data for numerous types of geology, when analyzing unknown subsurface geology. Removing geological filter data content corresponding to known geology from the acquired geologic imaging data provides for immediate recognition of unknown and suspect subsurface objects. The geologic imaging system preferably includes a ground penetrating radar system having a plurality of antennas oriented in an orthogonal relationship to provide three-dimensional imaging of subsurface geology. [A2754]

"Method and apparatus for recognizing whether traffic drives on the right or on the left"

A method and an apparatus based thereon are described for the automatic recognition of whether, in a traffic situation or in a traffic environment, vehicles are driving on the right or on the left. Said method is used in a motor vehicle as part of adaptive speed control. The prevailing direction of traffic flow is determined on the basis of other vehicles, which are traveling toward the cited vehicle. for this purpose, a frequency distribution is created as a function of a lateral, preferably directional distance y, a center of gravity S of this frequency is determined, and then it is determined on what side of the controlled vehicle this center of gravity S is located. [A2755]

"Frequency hopping spread spectrum passive acoustic wave identification device"

A system and method for interrogating a passive acoustic transponder, producing a transponder signal having characteristic set of signal perturbations in response to an interrogation signal, comprising a signal generator, producing an interrogation signal having a plurality of differing frequencies, a receiver, for receiving the transponder signal, a mixer, for mixing the transponder signal with a signal corresponding to the interrogation signal, to produce a mixed output, an integrator, integrating the mixed output to define an integrated phase-response of the received transponder signal, and an analyzer, receiving a plurality of integrated phase-responses corresponding to the plurality of differing frequencies, for determining the characteristic set of signal perturbations of the passive acoustic transponder. [A2756]

"Device and method for sensing and protection of persons and objects"

An electronic device including a wave transmitter covering a determined spatial sensing field, and a wave receiver for controlling an automatic device, a radiating antenna including a waveguide having lateral faces and slots arranged on one of the lateral faces, wherein the slots radiate in planes substantially perpendicular to a longitudinal direction of the waveguide, and wherein the wave transmitter and the wave receiver are arranged at one end of the waveguide, a matched load arranged at an opposite end of the wave guide, substantially identical reflectors arranged over substantially the whole length of the waveguide, wherein the reflectors extend essentially symmetrically with respect to longitudinal plane of symmetry of the waveguide and making a predetermined angle with one another, and wherein the waveguide and the reflectors are composed of at least one piece. [A2757]

"System and method for distance measurement by inphase and quadrature signals in a radio system"

A system and a method for distance measurement utilizes a radio system. The distance is measured by determining the time it takes a pulse train to travel from a first radio transceiver to a second radio transceiver and then from the second radio transceiver back to the first radio transceiver. The actual measurement is a two step process. In the first step, the distance is measured in coarse resolution, and in the second step, the distance is measured in fine resolution. A first pulse train is transmitted using a transmit time base from the first radio transceiver. The first pulse train is received at a second radio transceiver. The second radio transceiver synchronizes its time base with the first pulse train before transmitting a second pulse train back to the first radio transceiver, which then synchronizes a receive time base with the second pulse train. The time delay between the transmit time base and the receive time base can then be determined. The time delay indicates the total time of flight of the first and second pulse trains. The time delay comprises coarse and fine distance attributes. The coarse distance between the first and second radio transceivers is determined. The coarse distance represents the distance between the first and second radio transceivers in coarse resolution. An inphase (I) signal and a quadrature (Q) signal are produced from the time delay to determine the fine distance attribute. The fine distance indicates the distance between the first and second transceivers in fine resolution. The distance between the first and second radio transceivers is then determined from the coarse distance and the fine distance attributes. [A2758]

"Integrated proximity detector for antennas"

A method and apparatus for detecting the presence of objects such as persons in front of a high-frequency communications antenna comprising a transmitting element connected to a circulator. The circulator is connected to an antenna system which transmits the signal pursuant to a designated communications or other application. The circulator is also connected to a regulator circuit which measures a reflected signal received from the circulator. The regulator circuit thereupon initiates a reduction or termination in power from the transmitting element, and/or initiates an alarm, when the regulator circuit detects a reflected signal having a magnitude indicating the presence of the object to be detected. [A2759]

"Positioning determination using one low-Earth orbit satellite"

A system and method for determining the position of a user terminal (for example, a mobile wireless telephone) in a low-Earth orbit satellite communications system. The system includes a user terminal, at least one satellite with a known position and velocity, and a gateway (that is, a terrestrial base station) for communicating with the user terminal through the satellites. The method includes the steps of determining a range parameter and a range-rate parameter. A range parameter represents a distance between the satellite and the user terminal. A range-rate parameter represents a relative radial velocity between that satellite and the user terminal. The position of the user terminal on the Earth's surface is then determined based on the range parameter, the range-rate parameter, and the known position and velocity of the satellite. [A2760]

"Radar sensor for a vehicle"

A compact, multi-beam motor vehicle radar sensor is described, which is placed in a housing, with an antenna arrangement consisting of a dielectric lens (15) and at least two first antenna feeds (161 to 163, 181 to 183) , which are arranged along a first straight line (20) and form a first row of antenna feeds, wherein at least one further antenna feed (164 to 165, 184 to 185) is provided, which is arranged in such a way that at least one further row of antenna feeds is formed along a further straight line (21) , wherein this further row can be congruently represented on the first row by a rotation around an imagined point of rotation (M) . Such a motor vehicle radar sensor can be very simply and cost-effectively adapted to different installed positions. [A2761]

"Lane change alarm for use in a highway vehicle"

A lane change alarm using data for a highway track. A highway track database provides geographical location points for a track of a highway lane. A differential global positioning system (DGPS) receiver provides a vehicle location. A longitudinal track matching code matches the vehicle location against a track location and provides a longitudinal direction and a transverse distance to an alarm gate. The alarm gate indicates an alarm condition unless a lane change signaler is operated for indicating that the lane change is intentional. The highway track database is created using a similar DGPS receiver by determining and recording highway track location points for a selected highway lane while driving on the highway lane. [A2762]

"Dual mode transmitter/receiver and decoder for RF transponder tags"

An enhanced backscatter RF-ID tag reader system and multiprotocol RF tag reader system is provided. In a multiprotocol mode, the system emits a non-stationary interrogation signal, and decodes a phase modulated backscatter signal by detecting a stronger phase component from quadrature phase representations or determining phase transition edges in a phase of a received signal. The RF tag reader system predicts or follows the phase of the backscatter signal, thereby avoiding interference from nulls in the received signal waveform due to the non-stationary interrogation signal, relative movement or environmental effects. An acoustic RF-ID tag detection system detects the reradiated signal corresponding to respective transformation of a signal in the tag. Detection of either type of RF-ID tags therefore is possible, and the absence of any tag or absence of any valid tag also determined. [A2763]

"Distance indicator system for golf"

A golf distance indicator system provides measurement and display of the distance between a golfer and the pin on the green he is approaching. The system comprises a portable unit carried by the golfer and an target unit located on the pin. With the portable unit, the golfer selects the hole he is playing then activates the system. The portable unit sends a wireless coded message to an intended target unit. When a target unit receives a message, it analyzes the message to see if it should respond. If the target unit determines that it should respond, it sends a coded responding message to the portable unit. When the portable unit receives a responding message, it analyzes the responding message to see if the responding message originates from the intended target unit. If it does, the portable unit calculates a distance based on the elapsed time for the communications and the speed of the communications. The results are displayed on the portable unit. [A2764]

"Method and an apparatus for controlling an oscillator for generating a linear frequency sweep by use of a phase-locked loop"

A method and an apparatus for controlling a radar oscillator for use in the traffic field, in particular for a car radar, for generating a linear frequency sweep. A phase-locked linearization loop generates a linear frequency sweep controlling a phase-locked oscillator loop, which has a considerably broader bandwidth than the linearization loop. [A2765]

"Enhanced impulse radar system"

An impulse radar system useful, for instance, for ground penetration provides three dimensional images of targets. The radar system includes an antenna array with an arrangement of elements that is irregular so that the spacing between elements is different, thereby minimizing redundancy of path geometry between the array elements and the target. This feature reduces unwanted array sidelobes. The radar system incorporates circuitry which permits the utilization of each array element as either a transmitter or receiver antenna element. This dual utilization increases the effective number of elements in the antenna array, providing increased gain and system resolution. The radar system receiver utilizes multiple antenna array receiver elements, each of which is connected sequentially, through a solid state switch, to a single analog to digital converter, thereby providing a digitized signal for processing and display. This arrangement requires only a single analog to digital converter, thereby reducing size, cost, and errors due to analog to digital converter non-linearities. [A2766]

"Apparatus for detecting magnetostrictive resonator and traffic system"

A magnetostrictive resonator detection apparatus includes a transmission section for transmitting a resonance frequency of a magnetostrictive resonator, and a reception section for detecting a resonance frequency oscillated by the magnetostrictive resonator. [A2767]

"Method and apparatus for an autonomous cloud radar"

A cloud radar apparatus is mounted on a portable containerized unit, a number of which may be located at various positions throughout the planet. Cloud radar data from each unit are periodically measured and stored and made available to researchers, upon request, through the Internet or other network. The system comprises two computers operating on different operating systems. A first computer uses a first operating system which allows it to readily interface with various radar equipment using an IEEE 488 interface or the like, to monitor the health of the equipment and operate the equipment. A second computer system uses a second operating system in a multi-user mode which allows it to readily access and manipulate data files and transfer data over the network. Communication between the two computers is achieved by allowing the first computer to log into the second computer as one of the multiple users. The first computer may upload data to the second computer using a FTP protocol or the like. A second user in the second computer may generate cloud radar images and apply calibration data to received data to produce calibrated data. A third user may be logged onto the second computer to handle data transfers to and from the network. By using two computers with operating systems selected for optimum performance with their respective tasks, the system of the present invention allows for completely autonomous operation of a remote radar site with automated collection and distribution of cloud radar data. [A2768]

"Method for range measurement and contour detection by means of microwaves"

A method provides for contactless measurement of the range between a transceiver unit for microwaves in the frequency band from 1 to 100 GHz and an object to be investigated using a pulse principle. The microwaves are focused onto the surface by an antenna to detect the contour of the object. In particular, the surface of a bolt produced using a spray compacting method can be detected. [A2769]

"Meteorological radar apparatus"

A meteorological radar apparatus which calculates a shift of the pulse synchronization of a transmission pulse signal output from a transmission unit and corrects the transmission timing of the transmission pulse signal based on the shift of the pulse synchronization so that the Doppler velocity of a reference target becomes zero, thereby preventing deterioration in the measurement accuracy of the Doppler velocity caused by the shift of the pulse synchronization of the transmission pulse signal. [A2770]

"Warning device for distance between cars"

A warning device for a distance between cars, for measuring a distance between a car and an object in front of the car, judging the possibility of danger on the basis of distance data thus obtained, and generating an alarm in the case where it is judged to be dangerous. The warning device provides a first alarm (a rear-end collision alarm) generated in a condition of alert which necessitates deceleration or braking, and a second alarm (an alarm for a distance between cars) generated in a condition of alert which does not necessitate deceleration nor braking, the first and second alarms, respectively, being judged by separate formulae for determining. Accordingly, it is possible to positively generate an alarm when deceleration or braking is necessitated. Further, the warning device discriminates a kind of an object being measured (a moving body, obstruction, guardrail or the like) to judge danger according to the kind of the discriminated object. Accordingly, it is possible to improve reliability of an alarm and, in particular, to reduce incorrect alarms such as by a guardrail. [A2771]

"Object locating system"

A portable system is provided that is operational for determining, with three dimensional resolution, the position of a buried object or a proximately positioned object that may move in space or air or gas. The system has a plurality of receivers for detecting the signal from a target antenna and measuring the phase thereof with respect to a reference signal. The relative permittivity and conductivity of the medium in which the object is located is used along with the measured phase signal to determine a distance between the object and each of the plurality of receivers. Knowing these distances, an iteration technique is provided for solving equations simultaneously to provide position coordinates. The system may also be used for tracking movement of an object within close range of the system by sampling and recording subsequent positions of the object. A dipole target antenna, when positioned adjacent to a buried object, may be energized using a separate transmitter which couples energy to the target antenna through the medium. The target antenna then preferably resonates at a different frequency, such as a second harmonic of the transmitter frequency. [A2772]

"Method for automatically controlling motor vehicle spacing"

In the method for automatically controlling the spacing of motor vehicles described in the specification, a lane width for a controlled vehicle which is defined for evaluation is varied as a function of transverse velocities of vehicles detected ahead of the controlled vehicle. [A2773]

"Process for measuring distance with adaptive amplification"

A process for determining the distance between a distance sensor and an object, wherein an analog input signal is directed to a transmitter of the distance sensor. The transmitter emits a wave which is reflected by the object. A receiver of the distance sensor receives the reflected wave and thereupon emits an analog output signal whose level is dependent upon the distance and/or the type of object. The output signal is amplified by a subsequently added amplifier. The amplifier signal is directed to an analog/digital converter and is converted into a digital signal. The digital signal is directed to an evaluation circuit for the computation of a distance value. The signal amplification of the amplifier is controlled in an adaptively dependent manner on the level of the output signal and/or in a manner dependent on the signal value of an amplification signal made available by the evaluation circuit which is characteristic of an anticipated distance range. [A2774]

"Oblique scanning ground penetrating radar"

A ground penetrating radar uses an oblique or grazing angled radiation beam to provide improved coupling of radar energy into the earth reducing forward and back scatter and eliminating the need to traverse the surface of the earth directly over the investigated volume. [A2775]

"Doppler radar speed measuring unit"

A Doppler radar speed measuring module, that is self-contained and handheld, is fabricated on a multilayer PCB (printed circuit board) containing at least one antenna array and electronic circuitry. In one embodiment the antenna array is located on a top side and electronic circuitry is located on a bottom side opposite the antenna, with a ground plane layer sandwiched between the antenna array and the circuitry. The electronic circuitry includes a dielectric resonator stabilized oscillator, a microwave amplifier, a microwave mixer, a microwave coupler, voltage regulators, mechanical switches, and a display to indicate the measured speed of a moving target. The oscillator generates a very stable microwave signal which is split with part of the signal fed to a mixer and part fed to a transmit antenna. In one embodiment plated through vias electrically connect the two sides together. A transmitted signal reflects off of a moving target and is received by a receive antenna. The receive signal is electrically conducted from the receive antenna to the opposite side by plated through vias and is mixed with the oscillator signal to produce a low frequency Doppler beat signal. The Doppler signal is amplified, filtered and digitized by the A/D. A microcontroller is programmed to determine the moving target speed from the Doppler signal frequency, and drive a display to show the result. [A2776]

"Ground penetrating radar with synthesized end-fire array"

In a ground penetrating radar system, A-scan images of subsurface targets lying along the antenna boresight axis can be substantially improved and generated in real-time by employing a synthetic aperture, end-fire array, despite the inhomogeneous nature of the subsurface volume. The synthetic aperture, end-fire array is achieved by generating electro-magnetic (EM) ultra-wideband impulses at a number of precise locations along the antenna boresight access, shifting the returned EM signals in the time domain according to the corresponding antenna boresight location, and then integrating the shifted, returned EM signals. [A2777]

"Alarm apparatus for alarming driver of vehicle and method of alarming the same"

An alarm apparatus for alarming a driver of a vehicle is provided. The alarm apparatus includes a first indicator disposed on a front center console inside the vehicle, a second indicator located in a windshield of the vehicle, a radar unit, a vehicle speed sensor and a controller. In operation, when a distance between the vehicle and the one ahead is less than a first alarm distance, the first indicator is activated to display the alarm. Further, when the distance is less than a second alarm distance smaller than the first alarm distance, the second indicator is activated to display the alarm. Even if the driver does not gaze ahead but the instruments, it is possible for the driver to look at the first indicator activated more frequency than the second indicator, thereafter shift his eyes ahead and finally brake the vehicle after confirming the preceding vehicle with composure. [A2778]

"Object detecting system for vehicle"

An object detecting system for a vehicle includes a radar. The radar includes an electromagnetic wave transmitting device for transmitting an electromagnetic wave in a direction of movement of the vehicle and a reflected wave receiving device for receiving a reflected wave from an object which exists ahead of the vehicle in the direction of movement of the vehicle. A determining device determines the presence or absence of an obstacle in the direction of movement of the vehicle based on the result of the detection by the radar. In the object detecting system, the radar can detect objects in a plurality of vertically different detection areas, respectively. In addition, it is clear in which areas the object has been detected. Thus, it is possible to appropriately determine whether there is a possibility that the object is an obstacle to the vehicle. [A2779]

"Predictive impact sensing system for vehicular safety restraint systems"

An improved safety restraint system for a motor vehicle including: safety restraint device such as a seat belt and air bag (s) for protecting an occupant during a crash, a processor for predicting the collision of an obstacle with the motor vehicle and for generating an output signal to activate various actuators, actuators for activating the restraint devices in dependence with an output of the sensors various sensors including a radar microwave or millimeter wave system for generating and propagating electromagnetic radiation waves and to receive reflected waves, the transmitted and received waves being of predetermined frequency, wavelength, spectrum, duration and power to provide a desired sensing range and response. [A2780]

"Predictive collision sensing system"

A relatively narrow beam of either RF or optical electromagnetic radiation is scanned over a relatively wide azimuthal range. The return signal is processed to detect the range and velocity of each point of reflection. Individual targets are identified by clustering analysis and are tracked in a Cartesian coordinate system using a Kalman filter. The threat to the vehicle for a given target is assessed from estimates of the relative distance, velocity, and size of each target, and one or more vehicular devices are controlled responsive to the assessment of threat so as to enhance the safety of the vehicle occupant. In a preferred embodiment, a quantized linear frequency modulated continuous wave RF signal is transmitted from and received by a multi-beam antenna having an aziumthal range of at least +/-100 degrees and an individual beam width of approximately 10 degrees. [A2781]

"Modulated backscatter sensor system"

A radio communication system includes an Interrogator for generating and transmitting a radio signal. One or more Tags contained within the radio communication system receive the radio signal. A Backscatter Modulator modulates the reflection of the radio signal using a subcarrier signal, thereby forming a reflected modulated signal. The Interrogator receives and demodulates the reflected modulated signal. Based upon the characteristics of the demodulated signal, the Interrogator can determine the identity of the Tag, and the relative velocity of the Tag with respect to the Interrogator. The Interrogator can also determine if motion exists in the vicinity of the Interrogator, even when no Tag is present, without the need for a separate motion detection system. The characteristics of the demodulated signal, can also be used to determine the characteristics of motion of the Tag, such as the vibrational frequency. Alternate embodiments allow the Interrogator to transmit a first information signal to one or more tags, specifying which Tags should respond using Modulated Backscatter, so that the characteristics of only particular Tags can be determined. Further alternate embodiments allow the Tag to input analog data, and perform analog to digital conversion of that data. This data may be then transmitted to the Interrogator using Modulated Backscatter. Alternately, this data may be used as input to calculations performed in the Tag in order to analyze the frequency characteristics of the analog input. The Tag can also, based upon the results of these calculations, identify an abnormal condition and notify the Interrogator of the existence of such a condition. [A2782]

"Radio-interrogated surface-wave technology sensor"

Radio-interrogated surface-wave technology sensor, in which the sensitive element (12) is an impedance which is electrically connected as termination to a surface-wave structure (26) of the sensor. [A2783]

"Vehicle on which millimeter wave radar is mounted"

The present invention relates to a vehicle with a millimeter wave radar by which not only a distance and a relative velocity can be measured but also traffic information of other various kinds can be obtained. A reflector (4a) which is installed at a predetermined position (5) near a road along which the vehicle (1) is traveling and changes the reflection intensity of a reflected wave (3b) every predetermined period of time to indicate a road state (X) near the predetermined position (5) and traffic information with the change (N1) , a memory unit (6) which is mounted on the vehicle (1) and in which the change (N1) and an operation command (S1) of the vehicle (1) based upon the change (N1) are stored beforehand, being made to correspond to each other, and a control unit (8) which is mounted on the vehicle (1) , reads the operation command (S1) corresponding to the change (N1) detected by the millimeter wave radar from the memory unit (6) and supplies the read operation command (S1) to a vehicle operating means (7) of the vehicle (1) to operate the vehicle (1) are provided. [A2784]

"Signal processing and systematic phase coding for mitigation of range and velocity ambiguities in Doppler weather radars"

A method for resolving range ambiguities and separating overlaid signals in a Doppler weather radar is proposed. for uniform PRT transmission, it consists of a special deterministic code for phases of the transmitted pulsed, and associated decoding and processing of return signals. In the decoding process when the signal from one range interval is made coherent, the signal from the other range interval has a multiple split spectrum. The multiple spectra have the same shape but are offset from each other. Processing steps to separate the overlaid signals and a procedure to estimate the spectral moments are given. One crucial aspect in this procedure is the magnitude domain deconvolution. The magnitude domain deconvolution is also applied to a staggered PRT transmission scheme whereby it enables the estimation of spectral parameters with much lower standard error than the known methods. Moreover, the magnitude domain deconvolution combined with special spectral processing solves the outstanding problem of ground clutter filtering in the staggered PRT sample sequence. [A2785]

"Radar system for observing weather phenomena with improved radar system parameters"

A radar system and method for observing weather phenomena which sets a weather model corresponding to weather conditions, determines the attenuation of a radio wave due to the atmosphere and particles based on the weather model, calculates a radar range using the attenuation of the radio wave, and determines radar system parameters based on the radar range. [A2786]

"Vehicle position detection system"

A system which accurately detects a position of a vehicle on a road regardless of weather is disclosed. Radio wave reflecting bodies are placed on a road, and transmitter-receiver which can transmit and receive radio waves of wavelength is longer than a millimeter are placed on a vehicle. Based on a ratio of reception strength of the transmitter-receiver in the right and left of the vehicle, a displacement of the vehicle relative to the radio wave reflecting body is detected. The radio wave reflecting bodies have apertures or notches in a predetermined interval so that the radio wave signals reflected thereby has periodicity, and can be distinguished from other objects on the road. [A2787]

"Radio frequency identification transceiver and antenna"

An enclosed transceiver includes an integrated circuit and a battery together laminated between two films. Printed conductors on each film couple operative power to the integrated circuit. Other printed conductors form an antenna coupled to the transceiver for sending and receiving signals. In a preferred embodiment, the integrated circuit has three terminals. The first terminal is connected to a first side of a thin film battery. The second terminal is connected to a first side of a printed loop antenna. The third terminal serves two purposes being connected to the second side of the battery and to the second side of the loop antenna. The enclosing films are treated with silicon nitride for hermeticity. Enclosed transceivers of the present invention are suitable for mass production in web, sheet, and tape formats. Such transceivers are useful as stamps, labels, and tags in object tracking systems including systems for mail delivery, airline baggage tracking, and inventory control. [A2788]

"Periodic probe mapping"

A method and apparatus for processing a time domain reflectometry (TDR) signal having a plurality of reflection pulses to generate a valid output result corresponding to a process variable for a material in a vessel. The method includes the steps of determining an initial reference signal along a probe, storing the initial reference signal as an active reference signal, periodically detecting a TDR signal along the probe in the vessel, and computing the output result using the TDR signal and the active reference signal. The method also includes the steps of determining an appropriate time for updating the active reference signal, automatically computing an updated reference signal at the appropriate time, and overwriting the active reference signal with the updated reference signal for use in subsequent computations of the output result. [A2789]

"System and method for intelligent cruise control using standard engine control modes"

A method for implementing an intelligent cruise control using standard engine control modes includes determining the distance and closing rate relative to a forward object or vehicle and using this information to implement a distance control mode and a speed control mode. The distance control mode maintains a selectable headway range relative to a forward object or vehicle and may include accelerating the vehicle or decelerating the vehicle by defueling, engaging an engine brake, or downshifting the transmission when engine speed permits. The speed control mode maintains a selectable cruising speed if no target vehicle is detected. This cruising speed set point also functions as an upper limit while in the distance control mode. The system and method effect the intelligent cruise control functions utilizing control logic external to the electronic engine control module utilizing the engine speed control mode or engine speed and torque limiting control mode of SAE J1922 or SAE J1939 standards. Alternatively, a cruise control limit speed may be broadcast via SAE J1587 to reduce the vehicle speed upon approaching a forward vehicle so as to reduce the need for driver intervention. The invention may periodically switch between engine control modes to avoid any control mode timeout imposed by some engine manufacturers. [A2790]

"Microwave antenna array for a motor vehicle radar system"

A microwave antenna arrangement, made up of a focusing element and at least one feeder element, in which arrangement, to attain a small size, at least one component support is arranged in a spatial area between the focusing element and the at least one feeder element, electronic or electrical components being located on the component support. The component support has a cut-out to allow passage of the electronic waves. The component support and the electronic or electrical components are provided for processing signals other than those received or emitted by the at least one feeder element. [A2791]

"Radar apparatus installed on vehicle for producing correct detecting result"

A radar apparatus installed on a vehicle includes a transmission section and a reception section. The transmission section has at least a transmission antenna, and emits a transmission wave toward a detection area in a front of the vehicle. The transmission wave may be reflected by a reflector such as a preceding vehicle to produce reflection wave, and the detection area includes a plurality of sub-areas. The reception section has at least a reception antenna, and receives and detects the reflection wave. A detecting unit detects a reflector indication data indicative of a reflector attribute for every sub-area for a current detection cycle based on the detecting result by the reception section. Also, the detecting unit determines whether the detected reflector indication data are correct, by use of the detected reflector indication data, to determine that the detected reflector indication data are final reflector indication data when it is determined that the detected reflector indication data is correct. A correcting unit corrects an incorrect part of the detected reflector indication data to a correct reflection indication data to produce the final reflector indication data, when it is determined that the part of the detected reflector indication data is not correct. A determining unit determines whether there is the reflector in the detection area, based on the final reflector indication data. [A2792]

"Vehicle with millimeter-wave radar"

The present invention relates to a vehicle with a millimeter-wave radar capable of traveling without incurring ground clutter and without the influence of pitching of the vehicle. Accordingly, a millimeter-wave transmitting/receiving antenna (2) fixed on the front surface of the vehicle (1) has an antenna beam width (.theta.) of about 4 degrees, an antenna fixing height (h) measured from a ground surface of about 1 meter to 2 meters, and a horizontal angle (.beta.) of a center (C) of the antenna beam of not less than -4 degrees. This vehicle may also be provided with a storage element (231) for storing course data (A) for the vehicle (1) in advance, an extraction element (232) for extracting a superimposed object (P3) , and an identification element (233) for comparing the superimposed object (P3) with the course data (A) and identifying the superimposed object (P3) . [A2793]

"Terrain bias compensator for doppler navigation systems"

A terrain bias compensator for a Doppler navigation system utilizes an auxiliary beam with each beam of the Doppler system to form Doppler beam pairs. The axis of the auxiliary beam is slightly offset from the axis of the main beam and is positioned so that the two axes are in the same vertical plane. After slant range compensation, the amplitudes of the Doppler spectrum of each beam is averaged over a predetermined time interval. The difference between the mean amplitudes of the two beams is divided by the offset angle to establish an amplitude per degree correction factor which is applied to the main beam signal returns to establish a main beam amplitude corrected Doppler spectrum. [A2794]

"Method for measuring the ground speed of a vehicle by means of radar using reflection of electromagnetic waves from the driving surface"

A method for measuring the speed (V) of a vehicle (1) relative to the ground, of the type using the deviation in frequency associated with the Doppler effect between a transmitted wave (3) sent by radar (2) solidly connected to the vehicle and a reflected wave (4) reflected by the ground, characterized in that radar of the type allowing simultaneous measurement of the relative distance (D) and the relative speed (V) between the vehicle and the ground is used, and that the distance measurement is used to validate the speed measurement. [A2795]

"Moving object high-accuracy position locating method and system"

In an automated roadway system having transponders or data-stations spaced at known positions along the roadway, a vehicle mounted system determines the position of a vehicle moving along the roadway. A vehicle borne transmitter transmits a spread spectrum transmit signal which is pseudo (PN) encoded. The transmitted signal is received by the transponder which emits a reply signal back to a vehicle borne receiver. The receiver also receives a second signal which may be a reply signal from the same transponder or a reply signal from an adjacent transponder. The system then measures a time difference between transmission of the vehicle originated interrogation signal and receipt of its corresponding reply signal to determine the distance between the vehicle and the transponder or reflector. Based on the determined distances, the positions of the transponders and the distance that the vehicle has traveled during its communications, the position of a vehicle is determined using triangulation methods. The interrogation signals may be spread spectrum signals that are pseudo-random (PN) encoded. When the signal is detected by a receiver in the transponder or in the vehicle receiver, the PN code is synchronized to the incoming signal to accomplish maximum correlation. The phase delay between the transmitted PN code and received PN code is used to determine the distances between the vehicle and the transponder. The periodically located transponders produce a reply signal including a PN code and embedded data which represents the transponder identification and its position, or other data which is desirable to transmit between the transponder and the vehicle traveling the roadway. [A2796]

"Information indicator for vehicle"

An information indicating device having an LED and a light transmitting structure is disposed within a line of sight of a vehicle operator so as to transmit light from the LED to the vehicle while the operator is driving the vehicle. A distance sensor measures a distance between a vehicle body and an object near it. An emission control circuit controls the LED based on an output of the distance sensor, thereby indicating predetermined information, such as a distance warning to the operator. An indicating portion is disposed on an end of a corner pole or a fender marker to receive light from the LED and transmit light to the vehicle operator without requiring the vehicle operator to substantially look away from the direction the vehicle is traveling or a mirror showing the driver the vehicle's traveling direction. [A2797]

"Animal body detecting system utilizing electromagnetic waves"

An animal body detecting system adapted to be mounted on a vehicle is capable of simply and accurately detecting whether or not an animal exists, i.e. for detecting a distance to an object in front of the vehicle and for discriminating whether or not the object is an animal at the same time, by utilizing electromagnetic waves. The system is comprised of transceiver devices for emitting a radio wave of a first frequency of 10 GHz and that of a second frequency of 60 GHz whose frequency is higher than the first frequency in the same direction and for receiving reflected waves, and discriminating devices for generating material detection data indicative of whether or not a combination, i.e. a ratio or a product, of receiving levels of the reflected waves of the respective frequencies is a combination of the case when the reflecting object is an animal body. It further comprises a detector for detecting a distance to the reflecting object based on the emitted waves and the received reflected waves. The system utilizes the discrimination result of whether or not the object is an animal and the measured distance thereto when traveling at night, in controlling the distance between vehicles and in controlling a vehicle speed. [A2798]

"System for detection and measurement of atmospheric movement"

A system for the detection and measurement of atmospheric air movement irregularities such as wind velocity vector, wind shear, downdraft, clear air turbulence, aircraft induced vorteces and turbulence, in particular along a glidepath near airports, whereby an air volume under investigation is illuminated by a radio wave transmitter with a beam of coherent electromagnetic energy and a resulting wave field is received and processed in processor means to derive information on the existence of said atmospheric irregularities and furthermore to give specific measurements of related parameters, comprising at least one receiver for said resulting wave field, which is due to scattering in said air volume, positioned at a bistatic location having a selected distance from said transmitter, characterized by acoustic transmitter means located between said transmitter and said at least one receiver, and adapted to emit acoustic waves into said air volume, with frequency and beamwidth of the acoustic waves chosen such that a resulting disturbance of the dielectric constant of air in said air volume, contributes to said scattering. [A2799]

"High performance vehicle radar system"

A radar system is described for use in vehicular applications. The radar system is particularly suited to backup warning systems and side-object warning systems. The radar minimies many of the problems found in the prior art by providing programmable delays and programmable gain. The radar uses a range search algorithm to detect and sort targets at various ranges within the field of view of the radar. Each target range corresponds to a particular delay and gain setting. The radar searches for targets at the various ranges by running a target search algorithm. for each target range, the search algorithm causes the proper time delay and gain setting. Targets within the selected range are detected and catalogued. A display is used to warn the driver of the vehicle of the presence of targets at the various ranges. The warning may be visual and/or audible. [A2800]

"Bathroom fixture using radar detector having leaky transmission line to control fluid flow"

Methods and devices for controlling the flow of fluid in fixtures, such as bathroom, restroom, or kitchen fixtures, using a radar detector with a leaky transmission line and fixtures using such methods and devices are provided. A bathroom fixture, in accordance with one embodiment of the invention, includes a fluid conduit, a radar detector for detecting one or more characteristics of one or more objects in a sensor field based on reflected electromagnetic signals from the one or more objects in the sensor field, and a controller coupled to the fluid conduit for controlling a flow of fluid in the fluid conduit in response to the detected one or more characteristics. The radar detector in particular includes a leaky transmission line for transmitting electromagnetic signals to form the sensor field and receiving the reflected electromagnetic signals. In accordance with one aspect of the invention, the sensor field is restricted from selected areas associated with spurious signals, such as areas of flowing water, areas near other fixtures, etc. The use of a radar detector with a leaky transmission line can, for example, improve the control of fluid flow in fixtures, such as bathroom fixtures. [A2801]

"Systems and methods for determining the distance between two locations"

A distancing system comprising radio frequency transceivers and data processing circuits. The radio frequency transceivers allow data transmission via a high frequency radio signal. The transmission and receipt of these radio signals can be timed to estimate distance. But the data processing circuits operate at local clock frequencies, and one cannot be sure at what point a give radio frequency signal was received to a resolution greater than one-half cycle of the local clock signal. The data processing circuits periodically "skip" to resynchronize with incoming data streams. These skips occur at intervals corresponding to the frequency difference between the local clock frequencies. This frequency difference can be used to pinpoint fairly precisely when a given radio frequency signal was received in a previous half-cycle of the local clock. Distances can thus be calculated based on a coarse timing value generated based on the local clock of one of the distancing units and first and second fine timing values generated based on the skips at one or both of the distancing units. [A2802]

"Vehicle-mounted radar apparatus"

A vehicle-mounted radar apparatus comprises: a transmitting-receiving device 8 including an FM modulator 1 for generating an FM modulation signal, a voltage controlled oscillator 2 for generating an electromagnetic wave subjected to FM modulation by the FM modulation signal, a transmitting antenna 4 for transmitting the FM-modulated electromagnetic wave, a receiving antenna 6 for receiving the electromagnetic wave reflected by a preceding vehicle 5, and a mixer 7 for mixing the FM-modulated electromagnetic wave and the electromagnetic wave from the receiving antenna and for outputting a beat signal, a signal processor 9 for computing a relative velocity and a relative distance with respect to the preceding vehicle on the basis of the beat signal, and a scanning mechanism 12 for rotatively driving the transmitting-receiving device, wherein a modulation period of the FM-modulated electromagnetic wave and a rotation angle range of the scanning mechanism are changed in accordance with the relative velocity and the relative distance with respect to the preceding vehicle. [A2803]

"Dynamic monitoring of vehicle separation"

A system for monitoring operation and location of a moving first vehicle relative to a second vehicle. A minimum separation distance between the first and second vehicles is estimated, based on the first vehicle velocity, and optionally on the second vehicle velocity, using location determination (LD) signals received from satellite-based transmitters from GPS, GLONASS and LEO satellites, or from ground-based signal sources such as LORAN signal towers, and using ranging signals from SONAR, RADAR or a similar system. The minimum separation distance is compared with the actual separation distance at selected times, and a vehicle driver is advised if the actual separation distance is too small, if the separation distance is decreasing too quickly, or if the second vehicle velocity is decreasing too quickly. The second vehicle may travel in the same traffic lane, in an adjacent lane, or on a road that intersects the road used by the first vehicle. Where the first and second vehicles travel on separate roads that will intersect, the system estimates whether the second vehicle will stop, or will be able to stop, at the intersection. The second vehicle may be a railroad car, such as a locomotive, or a road vehicle, such as an automobile, bus or truck. A maximum vehicle clear-view velocity, consistent with vehicle stopping within a selected distance, is estimated. Road conditions are estimated and compensated for in estimating the minimum separation distance and/or the maximum vehicle clear-view velocity. [A2804]

"Fog piercing ranging apparatus and method"

An apparatus and method for accurately determining a target distance in adverse weather conditions utilizing both LASER and RADAR is disclosed. The radar signals are used to determine an approximate range which is then used as a gating window for the determination of which laser reflection is from the actual target as opposed to a reflection from the atmospheric interference. The method basically comprises the steps of initiating a radar pulse in the direction of a target and receiving a reflection, transmitting a laser signal and receiving a plurality of reflections, determining an approximate range based on the radar signals, and using this approximate range to ascertain which of the laser reflections is from the target. This determination is preferably made by generating a gating signal and gate width from the radar signals and passing the set of laser range signals through the gate to eliminate the false signals and select the signal that survives the gate as the accurate target range. [A2805]

"Automatic vehicle identification system capable of vehicle lane discrimination"

A system of vehicle identification with a first interrogator that uses a Lower SideBand (LSB) receiver to receive a modulated signal from a vehicle transponder and a second interrogator that uses an Upper SideBand (USB) receiver to receive another modulated signal. The two interrogators are adjacent to each other at a toll plaza, and operate at different carrier frequencies to force a signal frequency bandgap between communication signals in adjacent vehicle lanes. [A2806]

"Vehicle obstacle detecting system"

A vehicle obstacle detecting system having a combination of different kinds of detectors, such as a laser radar and a millimeter-waver radar, to detect an obstacle present ahead of the course of vehicle travel. The system determines whether the detection output of the laser radar is similar to that of the millimeter-wave radar. When the result is positive, obstacle avoidance control is conducted based on the output of either the laser radar or the millimeter-wave radar. When the result is negative, it is determined that the laser radar (the detector normally of superior performance) is degraded and, based on the output of the millimeter-radar, obstacle avoidance control is conducted. With this, the outputs of the different kinds of detectors are fused and unified optimally, enabling effective obstacle avoidance control. [A2807]

"Surveillance method for wide areas"

A method for monitoring large surface areas. A thermal camera and an electromagnetic radar are rotated about a vertical axis to scan the area. The area is divided into sector-like surface elements. Monitoring criteria are established for each of the surface elements. Movements in the surface area being monitored are detected by the radar. The thermal camera is used to detect objects different, in temperature, from their surroundings. Detected objects are located in a surface element and identified in accordance with the monitoring criteria using at least one of the radar and thermal camera. [A2808]

"Method for determining the precipitation ratio by double polarization radar and meteorological radar for implementing such process"

A method for determining precipitation rate including on the basis of the signals received on the two polarization channels H and V of the radar, in firstly determining an estimate of the precipitation rates R.sub..alpha. in each range gate i along the radar beam for a single polarization, then a first estimated value (I.sub.1) of the integral of the precipitation rates and, finally, on the basis of the attenuated reflectivity coefficient (Z.sub.H.alpha. (r)) , an estimate of the unattenuated differential reflectivity coefficient (Z.sub.DRs (r)) . Furthermore, the measured value of the attenuated differential reflectivity coefficient (Z.sub.DRs (r)) is determined, and the integral (I.sub.2) of the precipitation rates is deduced therefrom, then is compared with the first estimated value (I.sub.1) so as to iteratively adjust a parameter (.alpha.) of the method when applied to the polarization H alone. When .alpha. has been adjusted, corrected values of the unattenuated reflectivity coefficient and the precipitation rate are provided. [A2809]

"Radar sensor for use in motor vehicles"

In order to make the connecting lines from at least one transmitting antenna element and at least one receiving antenna element to a common oscillator as short as possible, the receiving antenna element is arranged outside the radiation pattern of the transmitting antenna element, the transmitting and receiving antenna elements being oriented in different directions. An arrangement deflects the reflected radar beams onto the receiving antenna element and/or deflect the radar beams emitted by the transmitting antenna element in a desired direction. [A2810]

"Phase-comparator-less delay locked loop"

A delay locked loop clock circuit employs an analog control loop for generating picosecond-accurate clock delays. A linear analog comparison circuit operating on integrated DC levels replaces the usual digital phase comparator for substantially improved timing accuracy. In operation, clock pulses from a first delay path are integrated and applied to a loop control amplifier. Clock pulses from a second delay path are integrated and applied to a differencing input of the loop control amplifier. The loop control amplifier regulates the delay in the second delay path to balance the integrated clock pulse voltages against externally applied control voltages. The delay between the first path and the second path is thereby precisely controlled by external voltage inputs. The first and second path clock output timing relationship is directly measured by analog voltage devices, eliminating error-prone high-speed phase comparators employed in prior art approaches. [A2811]

"Method and apparatus for detecting obstacles using multiple sensors for range selective detection"

A method and apparatus is disclosed to detect an obstacle in the path of a mobile machine. The present invention scans a field of interest by each of a plurality of obstacle sensor systems, weights the scanned data received from the obstacle sensor systems, and determines at least one characteristic of the obstacle as a function of the weighted scanned data. [A2812]

"Rangefinder"

For improving the measuring precision, a reference unit (REF) is juxtaposed with a continuous wave radar (DSR) . This reference unit (REF) comprises a surface wave element (OFW) for generating a signal delayed relative to the transmission signal. A mixed signal is formed from the delayed signal and the transmission signal with a mixer (MI2) , this mixed signal being utilized in combination with the measured signal stemming from the continuous wave radar (DSR) for determining the distance. [A2813]

"Vehicle with millimeter-wave radar"

The present invention relates to a vehicle with a millimeter-wave radar capable of accurately detecting stationary objects around the vehicle while positively accepting ground clutter. Accordingly, the vehicle is provided with a millimeter-wave transmitting/receiving antenna (2F) fixed thereto with the center (C) of an antenna beam directed to a road surface (5) , and a discrimination element (6) for classifying detected objects (4) by discriminating between objects (4a) the distance (L) to which varies with a movement of the vehicle and objects (4b) the distance (L) to which does not vary with a movement of the vehicle. [A2814]

"Method of manufacturing an enclosed transceiver"

The present invention teaches a method of manufacturing an enclosed transceiver, such as a radio frequency identification ("RFID") tag. Structurally, in one embodiment, the tag comprises an integrated circuit (IC) chip, and an RF antenna mounted on a thin film substrate powered by a thin film battery. A variety of antenna geometries are compatible with the above tag construction. These include monopole antennas, dipole antennas, dual dipole antennas, a combination of dipole and loop antennas. Further, in another embodiment, the antennas are positioned either within the plane of the thin film battery or superjacent to the thin film battery. [A2815]

"Near-range proximity sensor having a fast-tracking analog"

A proximity sensor having a generator providing a signal of which a small portion is used as a reference signal and the remaining portion is radiated out towards a target. The radiation reflected from the target is equalized and/or normalized relative to the reference signal. The signals are compared in terms of relative phase relationship. This relationship implies the distance of the target from an antenna. An example target may be a rail wheel. A certain part of the wheel is measured in terms of distance from the sensor. This distance may determine wheel wear. Such wear is gauged relative to a threshold signal or reference distance. Also, speed and direction of the rail wheel can be determined from the signal reflected back to the proximity sensor. [A2816]

"Vehicle-mounted radar apparatus"

A variable-scanning-speed mechanical driving unit is provided for providing control in such a manner as to acquire data while continuously changing in a range of a scanning angle the direction of an antenna unit for transmission and reception of radio waves. A so-called warning mode which is primarily aimed at the prevention of a collision is set, and a data updating period is shortened by making the scanning speed for transmitted radio waves and received radio waves so relatively high so as to shorten the data updating period. In a case where a so-called follow-up mode which is primarily aimed at follow-up traveling is set, the scanning speed for transmitted radio waves and received radio waves is made relatively low so as to extend the data updating period. Accordingly, the vehicle-mounted radar apparatus can be used as a following-distance warning apparatus or a following-distance controlling apparatus, to make it possible to obtain such as resolutions of the relative distance and relative velocity and a data updating period which are optimally suited for one's own vehicle and a driver in correspondence with the situation during actual use of the apparatus. [A2817]

"Method for detecting a radar target"

The invention relates to a method of detecting a radar target, especially a sea target, in the presence of clutter caused by ocean waves in particular. To detect a radar target within a predeterminable region, first a measurement window corresponding to this region is formed in the video range of the radar system, and a frequency distribution is determined for all pulse-height values (amplitudes) within the measurement window. The average value and the standard deviation can be determined from the distribution, from these values, a hit-recognition threshold is determined and used to decide whether a pulse-height value is to be associated with a radar target to be detected. [A2818]

"Vehicle-mounted radar apparatus"

Data is acquired by transmitting radio waves or by receiving radio waves by means of a fixed beam provided in a vehicle-mounted radar apparatus, and an antenna unit is provided which has such an antenna gain that a straight line-of-sight distance with respect to each straight line-of-sight angle from a subject vehicle to a preceding vehicle traveling on a subject-vehicle lane is set as a maximum detection distance. Therefore, it is possible to detect a preceding vehicle traveling on a subject-vehicle lane from a subject vehicle, and not detect objects such as vehicles which are present in a longer distance than is necessary, thereby alleviating a burden on signal processing. [A2819]

"Locating system and method employing radio frequency tags"

A locating system and method employs a plurality of radio frequency readers arrayed with respect to a region having a plurality of zones within which a plurality of radio frequency tags are to be located. Each reader identifies those tags present within its coverage area. The coverage areas of all the readers taken together substantially cover the region and at least part of the coverage area of each reader overlaps at least part of the coverage area of at least one other reader. A data processor receives the identification of the tags within the coverage area of each reader and applies a set of locating rules to determine therefrom in which zone within the region each identified tag is located. [A2820]

"Apparatus and method for fleet control when unmanned and manned vehicles travel together"

An apparatus and a method for fleet control when manned and unmanned vehicles travel together, and prevents mutual interference when manned vehicles simultaneously travel with unmanned vehicles on the same traveling course. To this end, in the apparatus, the unmanned vehicle includes an unmanned vehicle position detecting device, an unmanned vehicle transmitter/receiver, and an unmanned vehicle controller. The manned vehicle includes a manned vehicle position detecting device, a manned vehicle transmitter/receiver, a manned vehicle controller) , and an alarm device. The manned vehicle controller compares unmanned vehicle position data and manned vehicle position data, and outputs an alarm signal for avoiding the unmanned vehicle when the unmanned vehicle travels ahead of the manned vehicle and the distance up to the unmanned vehicle is shorter than a predetermined value. [A2821]

"Vehicle mounted radar apparatus"

In a vehicle mounted radar apparatus such as a pulse Doppler radar, electromagnetic waves produced by an oscillator can be prevented from returning therefrom a reception system by means of a transmission system. The vehicle mounted radar apparatus includes the oscillator for generating electromagnetic waves, a transmitter for transmitting the electromagnetic waves generated by the oscillator to a target, a receiver for receiving electromagnetic waves reflected from the target, a switch for connecting the transmitter to an antenna during transmission of the electromagnetic waves, and for connecting the antenna to the receiver during reception of the electromagnetic waves, a signal processor for calculating a distance between the vehicle and the target, and also a relative speed between the vehicle and the target based upon the electromagnetic waves transmitted to the target and reflected from the target, and a power supply interrupter for interrupting the supply of voltage to the transmitter. Accordingly, during reception of the electromagnetic waves, the supply of voltage to the transmitter is turned off by the power supply interrupter, so that transfer of the electromagnetic waves from the transmitter to the receiver can be prevented. [A2822]

"Method and arrangement for avoiding and/or minimizing vehicle collisions in road traffic"

In the method and arrangement for avoiding and/or minimizing collision situations in road traffic described in the specification, a first plurality of sensors provides a representation of the surroundings of the motor vehicle, a second plurality of sensors senses the vehicle operating characteristics and a seat occupancy detector detects seat occupancy in the vehicle. The data relating to the surroundings and the vehicle operating characteristics are supplied to an evaluation unit which is connected to a plurality of vehicle control actuators which are actuated, if necessary, based on seat occupancy in the vehicle to avoid a collision or to produce in the minimum damage in a collision. [A2823]

"Hierarchical data matrix pattern recognition and identification system"

The present invention relates to a hierarchical artificial neural network (HANN) for automating the recognition and identification of patterns in data matrices. It has particular, although not exclusive, application to the identification of severe storm events (SSEs) from spatial precipitation patterns, derived from conventional volumetric radar imagery. To identify characteristic features a data matrix, the data matrix is processed with a self organizing network to produce a self organizing feature space mapping. The self organizing feature space mapping is processed to produce a density characterization of the feature space mapping. The self organizing network is preferably completely unsupervised. It may, under some circumstances include a supervised layer, but it must include at least an unsupervised component for the purposes of the invention. The "self organizing feature space" is intended to include any map with the self organizing characteristics of the Kohonen Self Organizing Feature Map. The frequency vector of a CAPPI image that has been derived is a data abstraction that can be displayed directly for examination. In preferred embodiments, it is presented to a classification network, e.g. the standard CPN network, for classifying the density vector representation of the three dimensional data and displaying a representation of classified features in the three dimensional data. A novel methodology is preferably used for incorporating vigilance and conscience mechanisms in the forward counterpropagation network during training. [A2824]

"Moving subject recognizing system for automotive vehicle"

A moving subject recognizing system for recognizing a subject, such as a pedestrian, moving toward a forward path of a vehicle to avoid a collision against the subject scans a field ahead the vehicle to detect a transverse velocity of a subject moving in a transverse direction and a longitudinal distance of the subject in a direction of the traveling path which are compared with a first and a second threshold value, respectively, and recognize that the subject is in danger of entering the traveling path and hit by the vehicle when the transverse velocity is greater than the first threshold value and the variation of the longitudinal distance is smaller than the second threshold value. [A2825]

"Antenna apparatus"

An antenna apparatus for use as in an automobile collision warning system has a primary radiator for radiating a high-frequency radio wave beam, a reflecting member for reflecting the radio wave beam, an actuating mechanism for actuating the reflecting member, and a lens such as a dielectric lens for converging the radio wave beam reflected by the reflecting member to reduce an angle of divergence of the radio wave beam. [A2826]

"Release device for passenger restraint systems in a motor vehicle"

The invention relates to a triggering control device for occupant restraint systems in a vehicle whose triggering readiness can be influenced as a function of collision-relevant parameters. According to the invention, collision parameter detection comprises object detection, which can detect a collision object before a collision occurs in an area near the vehicle, and can determine at least a relative speed. Whenever a collision object is detected, a signal generator delivers a collision parameter signal that depends on the relative speed determined. In a preferred embodiment the collision parameter detection unit also determines the intrinsic speed of the vehicle and whenever no collision object is detected, the signal generator supplies a collision parameter signal influenced by the intrinsic speed. [A2827]

"Method of protection against impacts between two vehicles by at least on inflatable member and device for implementing it"

A method of protection against impacts between two vehicles by means of an member, in which each of the vehicles includes an inflatable member adapted to be deployed under control of a signal commanding opening of the inflatable member, the method including the steps of detecting from a first vehicle an impending collision of the two vehicles, transmitting from the first vehicle a first signal commanding opening of the inflatable member associated with the first vehicle, receiving the first signal commanding opening of the inflatable member associated with the first vehicle, by the second vehicle, and transmitting to the second vehicle a second signal commanding opening of the inflatable member associated with the second vehicle. A device for implementing the above method is also disclosed. [A2828]

"Device for directional transmission and/or receiving of electromagnetic waves"

In a device for directional transmission and/or receiving of electromagnetic waves, including at least one antenna element and a dielectric lens, there is arranged between them a prefocusing dielectric body for avoiding overradiation of the lens. In order to simplify adjustment, the lens has an extended surface, is preferably pot-shaped, and forms, in conjunction with a baseplate, a hermetically sealed housing for unencapsulated ICs. [A2829]

"Vehicle collision radar with randomized FSK waveform"

An automotive radar incorporates a repetitive randomized equivalent LFM sequence of frequencies for improved immunity to jamming from other automotive radars. Each frequency in the sequence is of sufficient duration to travel round trip over the detection range of the radar. The Doppler shift in the received signal is estimated by performing a spectral analysis on similar frequency components of the received signal, and is then removed from the entire received signal. The received signal is then reordered so as to form an equivalent LFM received signal, and is compared with a similarly reordered image of the transmitted signal so as to estimate the range to the target. The randomization sequence, initial start frequency, or initial start time of the repetitive sequence are varied to minimize the effects of jamming by other radars, and this variation can be directionally dependent. [A2830]

"Method and apparatus for recognizing a vertical misalignment of a clearance sensor"

A method and an apparatus on the basis of which a vertical misadjustment or misalignment of a clearance sensor, which is installed in or on a motor vehicle, can be recognized. Pitch motions of the motor vehicle are determined, for example via sensors, in the form of pitch angles, and are correlated in an analysis and control device with data and/or signals which were generated or prepared by the clearance sensor, and which contain the target detections or target detection losses. [A2831]

"Angular shift determining apparatus for determining angular shift of central axis of radar used in automotive obstacle detection system"

An angular shift determining apparatus is provided which may be employed in an automotive obstacle detection system designed to determine a distance to and angular direction of a target tracked by a radar. The angular shift determining apparatus determines an angular shift of the central axis of radiation of radar waves from the longitudinal center line of a vehicle equipped with the obstacle detection system based on a relative position of the target and removes from the determined angular shift an error component produced when a preceding vehicle traveling with a lateral offset from the system vehicle is tracked as the target and an error component produced when a stationary object located on a curved road is tracked by the radar as the target to mathematically project an actual angular shift of the central axis of radiation of radar waves. [A2832]

"Method and device for the removal of ambiguity in distance, applied especially to frequency-shift keying continuous-wave radars"

Disclosed are a method and a device for the removal of ambiguity in distance. The method computes the distance of the targets detected by the radar using several estimation functions (21, 22, 23) . When the estimation functions give substantially the same result, the targets are defined as being in the field of non-ambiguous distances and when the estimation functions give different results, the targets are defined as being in the domain of ambiguous distances. Application especially to frequency-shift keying, continuous-wave radar for automobile traffic control. [A2833]

"Speedometer assisted patrol speed search for DSP traffic radar"

A digital signal processor (DSP) traffic radar utilizing pulses from the patrol vehicle's electronic speedometer to steer the DSP's search of Doppler return information for the patrol vehicle's radar return signal, to improve target identification and minimize inaccuracies. In moving mode, when the patrol vehicle comes to a stop, no pulses are received by the DSP and therefore the patrol speed is set to zero, eliminating false association with other moving targets. [A2834]

"Vehicle having a scanning system"

A vehicle having a scanning system for zero contact scanning of one or several mutually spaced road areas and having an analyzing system connected behind the scanning system. The analyzing unit is equipped for determining the roll-over angle, the roll-over moment, the vehicle load condition and/or the road condition via measured data detected and supplied by the scanning system. The resulting data is particularly suitable for the early determination of dangerous influences on the driving dynamics of a vehicle. [A2835]

"Obstacle recognition system for automotive vehicle"

An obstacle recognition system for automotive vehicles is provided which is designed to distinguish preceding vehicles from other objects and uses data thereof in intervehicle distance control, for example. The system includes a radar unit and a preceding vehicle determining circuit. The radar unit receives a signal produced by reflection of at least one of transmitted radar signals from an obstacle present in a given obstacle detectable zone to determine a distance to the obstacle and a horizontal and a vertical angle of the obstacle from a preselected reference direction. The preceding vehicle determining circuit includes a two-dimensional shape data producing circuit that produces two-dimensional shape data of the obstacle on a two-dimensional plane in a width-wise and a vertical direction of the system vehicle based on the distance and the horizontal and vertical angles determined by the radar unit and a non-vehicle determining circuit that determines the obstacle as an object other than the vehicle when the two-dimensional shape data of the obstacle lies out of an ordinary vehicle shape range. [A2836]

"Meteorological radar system"

A meteorological radar system that can continuously and detailed observe an object. The search radar section continuously searches for an atmospheric phenomenon as a target within a wide search range while the search radar control section rotatably scans the search radar antenna. The scanning range deciding section decides the scanning range of an observation radar section from the location of an atmospheric phenomenon detected by the atmospheric phenomena detecting section with the data obtained by the search radar section and thus sets the observation radar control section in the observation radar section to the scanning range. The observation radar antenna can continuously observe a narrow scanning area corresponding to an object with narrowed beams while the search radar section continues its searching operation, so that an object can be measured with high space and time resolution. [A2837]

"Method and apparatus for predicting a crash and reacting thereto"

A method and apparatus are described for predicting a crash and reacting thereto. Advantageously, the inventive apparatus is mounted on a vehicle and determines the time-to-impact for approaching obstacles that are within a limited distance from the host vehicle. The sensing distance from the vehicle is set by signal processing of reflected signals and rejection of all responses corresponding to a distance greater than the preset limiting value. The effect of the invention is the projection of a sensing envelope or barrier outwards from that portion of the vehicle provided with the invention. Intrusion into this envelope is sensed for appropriate action, so as to provide a warning of 10 to

40 milliseconds prior to a collision. The invention relies on time-of-flight measurement of preferably short infrared pulses to locate the obstacle. Multiple sensors are used to provide area coverage and to determine size and extent of the obstacle. for each sensor, an algorithm determines if the measured data indicates a collision. An additional algorithm is used to determine if the signals from all sensors collectively warrant a warning signal to vehicle safety systems. The system can be deployed in the front of the host vehicle for warning of frontal impact, and at the sides for warning of side impact. The system can also be used at the rear for backup obstacle warning. Advantageously, the systems for side, front and back are independent. [A2838]

"Method and system for determining position of a cellular mobile terminal"

A method and system are disclosed by which a round-trip calculation is used to determine the distance between a mobile radio station (MS) and a radio base station (BS) using the apparent uplink and downlink signal propagation air-times (e.g., T-up and T-down) . As such, no absolute time reference is required. The MS and BS report to a service node in the mobile network the local departure and arrival times of the uplink and downlink signals, and calculate the apparent air-times, T-up and T-down. The distance, D, between the MS and BS can be calculated as D=c (T-up+T-down) /2, where "c" equals the speed of light. The distances, D1, D2 and D3, to at least three base stations whose locations are known, can be used in a triangulation algorithm to determine the MS's position. [A2839]

"Broadband CDMA overlay system and method"

A spread-spectrum CDMA communications system for communicating data between a plurality of users to a plurality of spread-spectrum units. The spread-spectrum communications system is located within a same geographical region as occupied by an existing FDMA, proposed TDMA or any other mobile-cellular system. The spread-spectrum CDMA communications system includes a plurality of spread-spectrum-base stations and a plurality of spread-spectrum units. A spread-spectrum-base station has a comb filter for notch filtering predetermined channels of the mobile-cellular system, a device for converting the format of the data into a form for communicating over radio waves, a spread-spectrum modulator for spread-spectrum processing the data, and a transmitter for transmitting the spread-spectrum-processed converted data from the spread-spectrum-base station to a spread-spectrum unit. The spread-spectrum-base station also has an antenna, and spread-spectrum detectors for recovering data communicated from the spread-spectrum units. A spread-spectrum unit has an antenna, and a detector, including a spread-spectrum demodulator, coupled to the antenna for recovering data communicated from the spread-spectrum-base station, and the spread-spectrum unit has a spread-spectrum modulator, a transmitter, and a device for converting the format of the data for communicating over radio waves. [A2840]

"Different models for RF signal train generators and interferoceivers"

Interferoceivers are apparatus which use optical fiber loop based radio frequency (RF) signal train generators to store transient pulses and regenerate their identical replicas for analysis. The present invention further advances the art of RF signal train generators and interferoceivers in investigating acoustical, electromagnetic, and optical transient phenomena. The disclosure includes mechanisms for tuning the interferoceivers, and means for forming synthetic images with chaotic pulses or pulses of opportunity. [A2841]

"Active vehicle deceleration in an adaptive cruise control system"

A vehicle adaptive cruise control system having active deceleration control provides for appropriate decelerations consistent with the objectives of preventing the vehicle from violating a desired minimum distance from a preceding vehicle and efficient utilization of road space through minimization of inter-vehicle spacing. [A2842]

"Antenna-shared distributor and transmission and receiving apparatus using same"

An antenna-shared distributor is provided such that a non-conductor section is provided in a part of two conductor planes, a dielectric resonator which resonates in the HE111 mode is disposed between the conductor planes, and first and second dielectric strips whose respective end portions face the dielectric resonator are disposed, forming first and second dielectric lines and further, a voltage-controlled oscillator and a mixer are connected to the first and second dielectric lines, respectively. [A2843]

"Doppler-based traffic radar system"

A Doppler-based radar system used to determine the speed of a selected moving target includes an array of selectable filters and related method for determining the speed of the selected moving target traveling in the same lane as a moving patrol vehicle supporting the radar system independent of the direction of the target relative to the platform. This allows the speed of the target vehicles traveling in the same lane and in the same direction as the patrol vehicle to be monitored without manual assistance from the operator. The radar system is further adapted in a stationary mode of operation to determine the speed of a selected moving target independent of the location of the patrol vehicle. This is accomplished by selectively filtering either all approaching or receding targets depending upon the traffic scenario. [A2844]

"Radar apparatus installed on vehicle for managing reflector information"

A radar apparatus installed on a vehicle includes a transmission section, a reception section and a processing section. The transmission section includes at least a transmission antenna, and emits a transmission wave toward a detection area in front of the vehicle. The transmission wave is reflected by a reflector to produce a reflection wave, and the detection area includes a plurality of sub-areas. The reception section includes at least a reception antenna, and receives and detects the reflection wave. The processing section detects a reflector indication data indicative of a reflector attribute based on the detecting result by the reception section, and then determines whether there is the reflector in the detection area, based on the reflector indication data. Also, the processing section manages the reflector indication data over a management area which is wider than the detection area. [A2845]

"Method and apparatus for directing a pursuing vehicle to a target with intelligent evasion capabilities"

A method and apparatus for directing a pursuing vehicle, such as a torpedo, on an intercept trajectory from a launching vehicle to a target vehicle th evasion capabilities. Models of the pursuing vehicle and evading target provide proposed trajectories based upon various environmental considerations. A guidance system uses estimates of initial operating parameter solutions, such as gyro angle, alertment time and intercept time, to begin a convergent, iterative process that defines final operating parameter solutions from which the guidance parameters are determined and transferred to the pursuing vehicle at launch. During each iteration, the solution determines an alertment time and an alertment bearing from the target vehicle to the pursuing vehicle at the alertment time. A selected evasive strategy includes a turn that is calculated relative to the alertment bearing. [A2846]

"Apparatus and method for imaging with wavefields using inverse scattering techniques"

An apparatus and method for rapid real time imaging with wavefield energy using a C.P.U. programmed to process data derived from wavefield energy that has been transmitted and scattered by an object so as to reconstruct a wavefield image of the object. Electronic signals are propagated and are transduced into wavefield energy waves which in turn are propagated toward the object. Detectors detect the wavefield energy waves scattered by the object. The detected wavefield energy waves are then electronically processed and input into a high-speed digital computer which may comprise a C.P.U. and/or a C.P.U. in combination with an array or parallel processor. Data is also prepared and input to the computer representing the incident field and the computer then reconstructs a high-quality image of the object having high spacial resolution and including actual properties of the object. The media in which the object is embedded may be fluid or solid, homogeneous, or layered (such as stratigraphic layering, or ocean velocity layers, or layering of composites in nondestructive imaging applications) , or may consist of porous material (either sedimentary deposits or composites in nondestructive testing) . [A2847]

"Highway vehicle guidance system"

A radar highway motor vehicle guidance apparatus for guiding a land vehicle along a roadway using a backward looking and a forward looking, lateral position sensing, monopulse tracking radar guidance apparatus which transmits radar pulses backward and forward of the vehicle. The pulses are reflected back to the vehicle by a stripe distributed along the roadway. The stripe is a frequency selective surface which generates retro-reflective grating lobes at an operating frequency of the tracking radar. Operating the radar at two frequencies allows the radar to look at regions spaced at two different distances from the front of the vehicle. Highway related information may be encoded in the frequency selective surface by variations in the shape or dimensions of the frequency selective stripe morphology in order to modulate the reflected signal with highway information which is then also detected at the radar receiver. Target discrimination is enhanced by using pseudo random codes and matching antenna polarization with stripe polarization. [A2848]

"Method and apparatus for sensing piston position"

A system for determining the position of a piston moveable within a cylinder, or of an implement or joint, is disclosed herein. Electromagnetic (EM) bursts such as ultra-wideband or frequency pulses are generated and applied to a transmitter/receiver unit. The EM bursts are launched by the transmitter via a focusing antenna assembly from an end of the cylinder housing towards the piston. The fluid in the cylinder housing is in electrical communication with the piston such that a surface of the piston represents an electrical impedance discontinuity which causes the EM bursts to be reflected back to the receiver. The time for the EM bursts to travel from the transmitter to the piston and for the reflections to travel back to the receiver via the antenna assembly is determined and converted into a position signal representing the piston's position. A compensation signal can be used to compensate the position signal for variations in a parameter of the fluid within the cylinder. The parameter may be the dielectric constant, and the variations may be caused by factors such as temperature, contamination and fluid type. The compensation circuit can include a pulse level analyzer, resonance circuit, mini-dipstick, or a capacitance circuit. [A2849]

"Angle extent estimation method for a motor vehicle object detection system"

A method of operation for a motor vehicle object detection system is described, in which the extent angle of an identified target is accurately determined by applying a point source scatterer identification technique to data at the periphery of a composite return. Return amplitude data from one or more complete scans of the sensor beam are collected and compared with a target threshold to identify objects in the viewing angle, thereby forming an array of amplitude data associated with successive beam positions for each identified object. In each array, the left-most and right-most pair of amplitude data points associated with successive beam positions are selected and individually used to compute the angle of a point source scatterer which would be responsible for that data pair. The computed scatterer angles are taken as the left and right edges of the target and used to determine the angle extent of the identified object, which in turn, enables reliable determination as to whether the identified object is in or out of the vehicle travel path, and what, if any, vehicle response is appropriate to maintain a given headway or avoid a collision with the object. [A2850]

"Spread spectrum localizers"

A network of localizers determines relative locations in three-dimensional space to within 1 cm by cooperatively measuring propagation times of pseudorandom sequences of electromagnetic impulses. Ranging transmissions may include encoded digital information to increase accuracy. The propagation time is determined from a correlator circuit which provides an analog pseudo-autocorrelation function sampled at discrete time bins. The correlator has a number of integrators, each integrator providing a signal proportional to the time integral of the product of the expected pulse sequence delayed by one of the discrete time bins, and the non-delayed received antenna signal. With the impulses organized as doublets the sampled correlator output can vary considerably in shape depending on where the autocorrelation function peak falls in relation to the nearest bin. Using pattern recognition the time of arrival of the received signal can be determined to within a time much smaller than the separation between bins. Because operation of standard CMOS circuitry generates noise over a large frequency range, only low-noise circuitry operates during transmission and reception. To provide the time accuracy necessary for distancing, a high-frequency clock operates during inter-localizer communications. The high-frequency clock uses a phase-lock loop circuit to increase the clock rate and a programmable delay to provide still finer time graduations. A stage in the low-frequency clock uses low-noise circuitry during transmissions and receptions, and standard circuitry at other times. [A2851]

"System for and method of determining the location of an object in a medium"

The depth of a metal object (for example) beneath the ground (for example) is measured by measuring propagation times of electromagnetic radiation travelling in two different paths within the ground, each from a transmission location via reflection from the object to a receiver location. There should be either multiple transmitter locations, multiple receiver locations or both and the spacing in the ground plane between the transmitter and receiver locations is known. By mathematically manipulating the propagation times for reflected signals travelling in different paths, dependence on the permittivity of the ground itself can be eliminated from the calculation of depth. [A2852]

"Antenna cluster for a motor road vehicle collision warning system"

A motor vehicle collision warning system 1 comprises an obstacle sensing system 3 including a plurality of sensors 5 together capable of sensing obstacles around the vehicle 7 and generating obstacle of concern signals when obstacles are sensed, and a warning control system 9 for receiving the obstacle of concern signals and for determining whether a collision warning signal should be generated. The sensing system includes at least one antenna cluster 11 mounted in the region of a corner 13 of the vehicle 7, the antenna cluster 11 comprising a radar transmit antenna 15 and two receive antennas 17 and 19. The transmit antenna 15 is mounted between the receive antennas 17 and 19. Receive antenna 17 faces towards the front of the vehicle and receive antenna 19 faces towards the rear of the vehicle. A trigger means 21 triggers the operation of the transmit antenna 15 and one or both of the receive antennas 17 and 19. [A2853]

"Alarm sensor and antenna arrangement"

A microwave frequency Doppler vehicle intruder alarm comprises an oscillator 3, a mixer 2 and an amplification stage 4, 5 having its output applied to a low-pass filter 7, whose output is split into two branches. A first branch, comprising a rectifier diode and a comparator, provides a signal on its output when a significant level of non-carrier microwave signals is received. This branch is sensitive to signals having Doppler frequencies of 0-200 Hz, which includes the intruder indicative frequencies. A second branch, comprising an amplifier 8, a high pass filter 9, and a comparator 10, provides an output signal on the detection of a significant level of signals in the 40-200 Hz band, which frequencies are indicative of externally generated interference. A logic element 15 mutes the output of the alarm when the second branch indicates the presence of externally generated interference. An antenna arrangement (FIG. 3, not shown) generates a rectangular radiation field which provides optimum coverage of the interior of a vehicle by being mounted in the roof thereof. Steering of the radiation field to provide optimum illumination when the arrangement is mounted off-center on the roof is achieved by the use of a shunt capacitor to effect a phase difference in signals applied to respective ones of first and second antennae. [A2854]

"Advanced signal process for a material storage measuring device"

An advanced signal processing technique accurately discriminates and estimates a small sinusoidal signal in close proximity from one or more large sinusoidal signals. The technique involves using digital processing techniques to accurately estimate the frequency (96) , amplitude (94) and phase (98) of the one or more large sinusoids and then using this estimate to obtain an accurate estimate of the small sinusoidal signal by subtracting the large sinusoid from the data to obtain a residual and reprocessing the residual. [A2855]

"Method and apparatus for precise noncoherent doppler tracking of a spacecraft"

A method and apparatus are disclosed for making precise velocity measurements of a spacecraft using a two-way noncoherent Doppler tracking system. The received uplink and transmitted downlink frequencies on-board the spacecraft are compared with the resulting information being included in the downlink signal and used to cancel spacecraft oscillator drift rate effects in the two-way Doppler measurement made by the ground station. The information can also be used to characterize the drift rate of the spacecraft oscillator, thus permitting periods of accurate one-way Doppler tracking by the ground station. To improve accuracy, the times at which the measurements comprising the information would have been observed on the ground are inferred from the measurement of a signal generated by the spacecraft, e.g., the telemetry frame start times, made by the ground station. [A2856]

"Wake filter for false alarm suppression and tracking"

A processing technique suitable for use with a search radar system which minimizes the false detection of targets. Rather than rely on a predetermined target trajectory, such as a straight line trajectory in range time space, the processing technique in accordance with the present invention is not based on a target dynamics model. The system in accordance with the present invention relies on past detections and assigns a confidence level to detections which are in the wake of a previous detection. A wake function is used to determine the amount by which each detection recursively accrues confidence based on a limited record of past detections. A detection is declared when the confidence level exceeds a predetermined threshold. As detections are encountered in range time space, such detections are used to form wakes based on the wake function which are used to assign confidence levels for future detections. [A2857]

"Radar angle determination with music direction finding"

An apparatus and method for target-angle determination using lower-frequency radars having compact non-moving antennas over broad viewing sectors. Use of direction finding (DF) in place of beam forming and scanning eliminates the need for conventional, physically large phased-array antenna systems. The described DF algorithm advances the art over previously described least-squares DF by allowing numerically efficient and robust resolution of multiple targets at closely spaced angles. When used with coastal HF ocean surface current and wave monitoring radars where sea echo is the target, the method extracts complex current patterns. The high degree of singularity of the antenna signal covariance matrix is exploited and used as the basis for extracting angles with minimal averaging. More receive antenna elements can be added at convenient locations to handle more complex target angle scenarios. [A2858]

"Method and apparatus for detection of a moving speed of a mobile terminal in mobile communication"

In accordance with the present invention, there is provided a method and apparatus for detecting a moving speed of a mobile terminal in a mobile communication utilizing time division multiple access system, wherein a measurement is made for a variation in delay of a burst radiowave received from the mobile terminal with reference to a transmission burst signal before a calculation of a moving speed of the mobile terminal is made on the basis of the measured variation in the delay. [A2859]

"Process for measuring the distance between a motor vehicle and an object"

In the case of a process for measuring the distance between a motor vehicle and an object, in the vehicle, in the case of a short distance of the object, the output signals of a first measuring device with a corresponding measuring range and, in the case of a longer distance of the object, the output signals of a second measuring device with a correspondingly longer measuring range are taken into account in a dominating manner. The measuring devices are constructed as analysis devices. The output signal of a single receiver for a single distance generator is supplied to the analysis devices as an input signal. The analysis devices analyze this input signal via an analysis process which is characteristic of the shorter or the longer distance range. [A2860]

"Object detecting system for vehicle"

In an object detecting system for a vehicle to detect an object in accordance with the result of a search operation of the radar, and to allow detection of a deviation of the radar search direction irrespective of the vehicle traveling condition. The stationary object decision unit detects whether or not an object recognized by the object recognition unit as a result of the search operation of the radar is a stationary object. The moving locus of the object, which was determined to be stationary, relative to the vehicle is predicted by the locus prediction unit based on the detected value produced by the motion state detection unit. The actual moving locus of the object, determined as a stationary object, as observed from the vehicle is calculated by the actual locus calculation unit. The predicted value produced by the locus prediction unit and the calculated value produced by the actual locus calculation unit are compared by the comparison device. Based on the result of this comparison, the improper state decision unit decides whether the radar is in an improper state or not. [A2861]

"GPS vehicle collision avoidance warning and control system and method"

GPS satellite (4) ranging signals (6) received (32) on comm1, and DGPS auxiliary range correction signals and pseudolite carrier phase ambiguity resolution signals (8) from a fixed known earth base station (10) received (34) on comm2, at one of a plurality of vehicles/aircraft/automobiles (2) are computer processed (36) to continuously determine the one's kinematic tracking position on a pathway (14) with centimeter accuracy. That GPS-based position is communicated with selected other status information to each other one of the plurality of vehicles (2) , to the one station (10) , and/or to one of a plurality of control centers (16) , and the one vehicle receives therefrom each of the others' status information and kinematic tracking position. Objects (22) are detected from all directions (300) by multiple supplemental mechanisms, e.g., video (54) , radar/lidar (56) , laser and optical scanners. Data and information are computer processed and analyzed (50,52,200,452) in neural networks (132, FIGS. 6-8) in the one vehicle to identify, rank, and evaluate collision hazards/objects, an expert operating response to which is determined in a fuzzy logic associative memory (484) which generates control signals which actuate a plurality of control systems of the one vehicle in a coordinated manner to maneuver it laterally and longitudinally to avoid each collision hazard, or, for motor vehicles, when a collision is unavoidable, to minimize injury or damage therefrom. The operator is warned by a heads up display and other modes and may override. An automotive auto-pilot mode is provided. [A2862]

"Road monitoring device"

A device for improving vehicle driving safety and comfort is disclosed. The main road sign information encountered during a journey is transmitted to the vehicle, the position of the vehicle on the driving surface is continuously monitored, and the road surface is checked for the presence of foreign matter such as mud, snow, ice, etc. A set of transmitting-receiving sensors (C1, C2) suitably arranged on the vehicle and facing the driving surface continuously observes changes in the reflective properties of the observed areas within the sensitivity range thereof. Markings defining lanes and shoulders lined with grassy, gravelly or sandy areas are sensed by the sensors (C1, C2) as soon as the vehicle approaches or drives over them. The signals from the sensors (C1, C2) are processed by an electronic unit (1) controlling an on-board signalling system (2) linked to an alarm system (3) for warning the driver of road hazards and possible unsafe driving (straying off-course, speeding, etc.) . By reacting instantly, the driver thus informed can avoid a potential accident. [A2863]

"Method and apparatus for hazard detection and distraction avoidance for a vehicle"

A system for detecting hazardous conditions during operation of a vehicle. In one embodiment, the system includes a plurality of sensors that monitor a plurality of conditions and transmit condition signals each representing a measure of a condition. A plurality of rate determination circuits is coupled to the sensors and continually receives the condition signals, wherein each rate determination circuit calculates rates of change for the condition, including a baseline rate of change, and outputs a potential hazard value representing a deviation of a rate of change from the baseline rate that exceeds a predetermined threshold value. An evaluation circuit receives the potential hazard value, calculates a new potential hazard value using the potential hazard value and a rate of change for at least one associated condition and determines whether an actual hazard exists by comparing the new potential hazard value with a stored value that corresponds to the condition. [A2864]

"Vehicle obstruction detection system"

A vehicle obstruction avoidance system particularly for reversing a vehicle towards obstructions not visible in the wing mirrors. A radar head is mounted on the rear bumper, the head including a scanner and sensor. The total range of interest is only a few meters and provides very little time for processing echoes from all range cells in the range. The invention provides a system in which only one range cell is processed with each pulse transmission and the range cell is stepped on for the next pulse. [A2865]

"Method and apparatus for calibrating azimuth boresight in a radar system"

A method and apparatus for calibrating azimuth boresight in a radar system. Antenna boresight misalignment can cause radar systems to inaccurately determine the position of targets relative to a platform vehicle. These errors can be corrected by detecting and accurately measuring a boresight offset angle defined as the angle between the radar antenna boresight and the direction of travel of the host platform vehicle. Several antenna boresight calibration techniques are described. A first technique calculates the boresight offset angle by obtaining target range and azimuth angle measurements at two instants in time. The boresight offset angle is determined by the geometric relationship of the offset angle, target range and azimuth values obtained at two successive time instants. A refined approach obtains target range and azimuth values at several successive time instants, calculating interim boresight offset angles at each time instant. The boresight offset angle is computed by averaging the interim boresight offset angles. In second and third calibration techniques, the boresight offset angle is estimated from the azimuth of qualified calibration targets that are substantially aligned with the host vehicle's heading. Several restrictions are imposed upon the potential calibration targets to suppress the erroneous qualification of adjacent vehicle traffic. In accordance with one embodiment of the present invention, the calibration techniques are implemented by software instructions executed by a microprocessor within the radar system. Once the boresight offset angle is detected and calculated, it can be used to calibrate the antenna boresight using either a mathematical or physical calibration approach. [A2866]

"Scanning mechanism for vehicle- mounted radar"

A scanning mechanism for vehicle-mounted radar comprises a first noncircular gear attached to an input shaft, a second noncircular gear meshed with the first noncircular gear, and a connecting link having one end connected to an eccentric pin provided on the second noncircular gear and another end connected to an antenna transmission/reception section, thereby allowing the antenna transmission/reception section to effect swinging motion. Angular accuracy in a frontal direction is improved by delaying the scanning velocity in the frontal direction. [A2867]

"Apparatus for detecting moving ball"

A system is provided with a directional antenna having first and second antenna patterns oriented around an antenna boresight direction. The antenna boresight is oriented in a direction corresponding to a play determinative line on a playing field. Signals are emitted firm a playing object, used as a ball and detect using the two antenna patterns. Comparison of the detected signals provides an output indication when the playing object crosses the play determinative line. [A2868]

"Method and equipment for weather image prediction"

An equipment for weather image prediction comprising: a field extracting portion, which calculates the velocity fields of the local echoes with respect to time and space from a plurality of time sequential frames of weather radar images for a plurality of frames therein, and which segments and extracts a field possessing similar velocities with respect to time and space as one precipitation field from said plurality of frames of weather radar images by employing said calculated velocity fields, a moving velocity estimating portion, which estimates the moving velocity of a precipitation field by obtaining the amount of movement, among the neighboring frames, of the precipitation field segmented and extracted by said field extracting portion, and a forecast image generating portion, which extrapolates a plurality of precipitation fields by employing a distance taken by multiplying the moving velocity of the precipitation field estimated by said moving velocity estimating portion by a desired forecasting time, and which generates a forecast radar image by synthesizing the resulting image. [A2869]

"CDMA communications and geolocation system and method"

A spread-spectrum CDMA communications system for locating remote units, and for communicating message data between a plurality of remote units and a base station. The spread-spectrum CDMA communications system includes a plurality of base stations and a plurality of remote units. A base station has a spread-spectrum modulator for spread-spectrum processing the message data, and a transmitter for transmitting the spread-spectrum processed-message data, combined with a generic-chip-code signal, from the base station to a remote unit. The base station also has an antenna, and spread-spectrum detectors for recovering message-data communicated from the remote units. A remote unit has an antenna, and a detector coupled to the antenna for recovering data communicated from the base station. The detector includes a spread spectrum demodulator. Also, the remote unit has a device for converting the format of the data into a form suitable for communicating over radio waves, a spread spectrum modulator and a transmitter. The base station has a range circuit, which comparers the generic-chip-code signal generated at the base station with the generic-chip-code signal received from the remote unit, for determining a range between the remote unit and the base station. [A2870]

"Partial probe mapping"

A method for processing a time domain reflectometry (TDR) signal having a plurality of reflection pulses to generate a valid output result corresponding to a process variable for a material in a vessel. The method includes the steps of determining a background signal for a probe and detecting a sample TDR signal for the probe in the vessel. At least one transition point is established on the sample TDR signal and the background signal. A portion of the sample TDR signal on one side of the at least one transition point is combined with a portion of the background signal on the other side of the at least one transition point to establish an initial boundary signal, and the initial boundary signal is stored. The method also includes the steps of detecting the TDR signal and calculating the output result using the initial boundary signal. [A2871]

"Enhanced microburst detection system"

A weather radar system (21) utilizing enhanced fuzzy logic processing (300) to detect atmospheric microburst events. In addition to the wind shear likelihood (250) , low level surface reflectivity likelihood (252) , and clutter likelihood (254) used by existing fuzzy logic based microburst detection systems to generate a combined microburst likelihood, one enhancement includes using reflectivity measurements of high level storm activity to generate an independent high level aloft reflectivity likelihood image (310) that corresponds to and confirms the findings of the low level surface reflectivity likelihood (252) . Another enhancement includes using a series of combined likelihoods saved over time (635) for N successive scans of the weather radar system (21) to generate a history likelihood (620) that eliminates spurious detections from one scan to the next. Another enhancement includes generating a microburst strength determination (330) based on the wind speed loss an aircraft would experience when flying through a microburst. [A2872]

"Intelligent walking stick"

A portable safety mechanism housed in a cane, a walking stick or a belt-carried housing. In each of such embodiments, the portable safety mechanism includes a processor, a transmitter, a receiver, and an outside image sensor or scanner, a warning device such as an audible warning device or warning light. The scanner may, for example, sense the shape of a traffic signal or the color of a traffic signal. [A2873]

"Personal messaging system and method"

A pager device received paging messages. The user reads a paging message, selects one of a set of stored, predetermine reply messages, and transmits the selected reply message from the pager. The reply signal is received by one of a set of local cellular receivers, which sends the received signal to a computer for interpretation. The computer initiates an action based on interpretation of the received reply signal. The communication system communicates with large numbers of pagers in a time and energy efficient manner. The pagers are associated with items located in a communication region that is interrogated by an interrogator on a one-to-many basis using broadcast commands, on a one-to-one basis using directed commands or on a combination basis using both methods. Messaging occurs through organized transmission and reception of signals between the pagers and the interrogator. A batch collection protocol uses a combined one-to-many and one-to-one communication system that effectively resolves communication contentions. The batch collection protocol employs a plurality of collection periods which communicate with large or unknown numbers of portable pagers. [A2874]

"Method and apparatus for control of vessel maneuvering"

An improved method and apparatus provide a control of the vessel maneuvering by a determination and displaying of the dangerous relative course zones, wherein the end of the vessel speed-vector should not be located for the object evasion tactic maneuvering and/or collision avoidance maneuvering and should be located for the object pursuit and/or interception tactic maneuvering. The apparatus comprises an object disposition evaluator, a control system, a dangerous criteria setting system, an initial data processor, at least one display and a dangerous relative course zone determiner, including an interface-signal distributor, a logic processor and signal distributor and a data processing system, comprising a trigonometric function processor, a summator, a multiplier-divider and a data processor. The dangerous relative course zones are displayed on at least one indicator, proving the operator with the possibility to evaluate the danger approach situation and instantly select the anti-collision maneuver for collision preventive maneuvering and/or select an optimal maneuver for the assigned vessel tactic maneuvering execution. [A2875]

"Phase difference measuring apparatus and method"

A phase difference measuring apparatus obtains a first receive signal by transmitting and receiving a to-be-measured material in a reference state and a second receive signal by transmitting and receiving a signal wave to and from that material in a measured state. The apparatus finds a reference phase difference .theta..sub.1 from the transmit wave and first receive signal and an apparent phase difference .theta..sub.2 ' from the transmit wave and second receive signal. The apparatus adds the apparent phase difference .theta..sub.2 ' to a product of the number of rotations, n, the apparent phase difference .theta..sub.2 ' passes through a given reference point and an angle of 360.degree. to find a true phase difference .theta..sub.2. The apparatus varies the number of rotations, n, to n+1 when the apparent phase difference .theta..sub.2 ', while being increased, passes through the reference point and that number of rotations, n, to n=n-1 when the apparent phase difference .theta..sub.2 ', while being decreased, passes through the reference point. [A2876]

"Three dimensional beamformed television"

The system provides three-dimensional real time imaging, with features that serve to control acoustic effects that cause interference. Systems are disclosed for medical imaging and other applications in fields that utilize radiated wave signals. The system includes visualization methods to enable guidance of surgical instruments as well as general medical diagnostic usage. The present invention uses a beamformed television method which achieves visual format imaging. Beamformed television includes orthogonal arrays to efficiently resolve two dimensions of a scene with measures to control grating lobes. Beamformed television also includes a method that reduces the time to transmit and receive signals by use of a single burst transmission of multiple frequency codes from each transducer which causes multiple, coded transmit beams that are radiated simultaneously. The addition of step chirp operations achieves highly precise range resolution which makes visual format imaging possible at selected ranges. It also enables a variety of visualization capabilities. The step chirp operation involves repeating the burst transmission at sequentially stepped frequencies. Thus, the frequency codes, that enable the transmit beamforming process, are shifted as a group for each frequency step of the stepped chirp. Frequency domain to time domain conversion using an FFT method efficiently yields range resolved signals. [A2877]

"Radar system, in particular motor vehicle radar system"

In a radar system, which is used particularly in motor vehicles, the angle at which a detected radar target is located are determined by providing that echo signals of the radar target are picked up via at least two reception channels, and their amplitudes are standardized and compared with standardized values, stored in memory, of a duplex antenna graph of the radar system. [A2878]

"Automatic sensor azimuth alignment"

This disclosure relates to a system for automatically measuring and compensating for any angle of misalignment of a forward-looking sensor of a vehicle. The sensor provides data representing the azimuth angle and the range of a target such as another vehicle. for each angle and range reading of the sensor, the location point of the target is estimated, after a series of such readings, the trajectory line of the target is estimated. The angle of misalignment is estimated from the angle between the trajectory line and the path of travel of the host vehicle. In subsequent readings of the sensor, the estimated angle of misalignment is subtracted from the measured azimuth angle to produce an accurate azimuth angle of the target. The accurate azimuth angle is provided for use by another unit such as a collision warning system and/or an intelligent cruise control. [A2879]

"Control equipment for difficult to see or blind spot areas around vehicles, and related method"

A control device for vehicles includes a sensor mounted to the vehicle for detecting an object in a monitored zone adjacent the vehicle and providing a responsive output signal when an object is detected in the monitored zone, a signaling device mounted to the vehicle for providing a speed output signal indicative of a speed of travel of the vehicle, a control unit mounted to the vehicle for receiving sensor output signals and speed output signals, and a warning device mounted to the vehicle for providing a warning signal to a driver of the vehicle, the control unit controlling the warning device to provide the warning signal responsive to the sensor output signal and the speed output signal so that the warning device provides a warning signal only when the sensor detects an object in the monitored zone and the signaling device provides a speed output signal indicating that the speed of the vehicle is below a predetermined value. A related vehicle and method are also disclosed. [A2880]

"Method and system for tracking multiple regional objects by multi-dimensional relaxation"

A method and system for real-time tracking of objects is disclosed. A region is repeatedly scanned providing a plurality of images or data sets having points corresponding to ojbects in the region to be tracked. Given a previously determined track for each object in the region, an M-dimensional combinatorial optimization assignment problem is formulated using the points from M-1 of the images or data sets, wherein each point is preferably used in extending at most one track. The M-dimensional problem is subsequently solved for an optimal or near-optimal assignment of the points to the tracks, extending the tracking of the objects so that a response to each object can be initiated by the system in real-time. Speed and accuracy is provided by an iterative Lagrangian Relaxation technique wherein a plurality of constraint dimensions are relaxed simultaneously to yield a reduced dimensional optimization problem whose solution is used to formulate an assignment problem of dimensionality less than M. The iterative reducing of dimensions terminates when exact solutions are determined for two-dimensional cases. A recovery procedure is used for determining a higher dimensional assignment problem solution from a problem having one less dimension. The procedure is useful when the reduced dimensional optimizational problem has two constraint dimensions. [A2881]

"Method and apparatus for in path target determination for an automotive vehicle using a gyroscopic device"

The present invention concerns a method, an apparatus and an article of manufacture that satisfies the need for determining whether or not an obstacle vehicle is in the path of a host vehicle. Specifically, the present invention satisfies the above stated regardless of whether or not the host vehicle is moving in a straight path or along a curved path. Preferably, input data ("input") is collected from instruments mounted to a host vehicle. The input is used to calculate for the host vehicle the average turn rate, the radius of curvature of the path being traveled, the velocity, and a range from the host vehicle to a obstacle vehicle. Additionally, the input is used to determine the deviation of an obstacle from a 0.degree. reference azimuth extending through the center of a radar beamating from a radar unit mounted to the host vehicle. An obstacle azimuth angle .varies..sub.i is calculated and used to determine whether or not the obstacle is in the path of the host vehicle. After a determination is made as to whether or not the obstacle is in the path of the host vehicle, the results of that determination are sent to and displayed by sensors and displays which designate the results. [A2882]

"Measuring distance"

An object in a storage area or moving vehicle is monitored by attaching an electronic tag to the object. An electronic device detects the presence of the object by communicating with the tag while the object is in storage or is being moved by the vehicle. The tags may also determine the location of an attached object and may reroute the object if it deviates from a given shipping schedule. A group of objects is monitored by two electronic tags, each attached to an object in the group. Each tag has circuitry for communicating information relating to an object in the group to a second tag. Each tag also includes a memory connected to the circuitry that is capable of storing the information, and a controller connected to the memory and the circuitry. A distance is measured by transmitting multiple symbols from one object to another object, having the symbols returned such that the symbols' measured round-trip times are not all identical, and calculating the distance using the measured round-trip times. [A2883]

"Method and apparatus for tracking of organized storms"

A method and apparatus for tracking of organized storms using weather radar images. An image filter approximating the envelope of the organized storm radar image is used to improve tracking of the large scale storm features. The image filter is repeatedly rotated to different orientations at each point in the weather radar images to produce filtered images. The filtered images are provided to an image tracker to generate an array of track vectors. Application of the array of track vectors to the unfiltered image generates a predicted weather radar image. [A2884]

"Scan-type radar apparatus for a vehicle to accurately detect an object in a lane of the radar equipped vehicle"

A scan-type radar apparatus for a vehicle which determines whether an object detected by the radar exists in the lane in which the radar equipped vehicle is moving with a high accuracy while restricting an increase of the manufacturing cost of the radar apparatus. A scan-type radar detects objects existing in a detectable range, the scan-type radar apparatus assuming a vehicle moving lane area corresponding to a vehicle moving lane in which the vehicle is moving based on an operating condition of the vehicle, the vehicle moving lane area being assumed within the detectable range. An actual direction of each of the objects is detected by the scan-type radar with respect to the radar equipped vehicle. A delay direction is calculated when the actual direction detected by an object direction detecting arrangement is changed with respect to time, the delay direction indicating a direction of a virtual position of each object with respect to the vehicle by being provided with a predetermined time delay with respect to a change in the actual direction. It is determined whether each object exists within the vehicle moving lane based on the delay direction. [A2885]

"Semiconductor module having antenna element therein"

A semiconductor module having a compact antenna element capable of providing desired directivity therein has been disclosed. When an electromagnetic-wave radiation window has the capability of a lens, directivity can be set arbitrarily. for improving directivity, a convergent lens for converging millimeter waves or quasi millimeter waves is employed. for impairing directivity, a divergent lens is employed. In the case of the convergent lens, a direction in which radio waves are radiated or received by the antenna element can be set by deviating the center axis of the lens from the center of the antenna element. [A2886]

"Ground penetrating radar with synthesized end-fire array"

In a ground penetrating radar system, A-scan images of subsurface targets lying along the antenna boresight axis can be substantially improved and generated in real-time by employing a synthetic aperture, end-fire array, despite the inhomogeneous nature of the subsurface volume. The synthetic aperture, end-fire array is achieved by generating electro-magnetic (EM) ultra-wideband impulses at a number of precise locations along the antenna boresight access, shifting the returned EM signals in the time domain according to the corresponding antenna boresight location, and then integrating the shifted, returned EM signals. In addition, an incremental, reverse-coherent integration technique is provided. This incremental technique allows for a more rapid generation of the A-scan image. The reverse-coherent integration technique eliminates unintended, stationary targets from the A-scan image, which are caused by coherent noise/clutter sources. [A2887]

"Multiple-beam radar system"

A multiple-beam radar system, in particular for motor vehicle applications. More transmission elements than reception elements are present. The transmission elements present can be activated both individually and also in any desired simultaneous combination. An observable angular region can thereby be widened, in economical fashion, as compared with known radar systems. [A2888]

"Method and system for producing images of an object"

A method and system are provided to produce images of an object. A receiving station is positioned in view of a range-coded signal emitting satellite and the object. The receiving station is sensitive to direct transmission of the range-coded signal and reflections of the range-coded signal from the object. Both range from the receiving station to the object and a Doppler frequency shift history between the receiving station and the object is determined using the direct transmission and reflections of the range-coded signal. An image is formed using the two-dimensional record provided by the range and the Doppler frequency shift history. [A2889]

"Mobile station position determination in a wireless communication system"

Methods and apparatus for determining mobile station position in a wireless communication system are disclosed. A mobile station of the wireless system includes a silent echo generation circuit which receives a transmit time stamp transmitted in a sync channel from a base station, and processes the transmit time stamp to generate a receive time stamp. The silent echo generation circuit transmits the receive time stamp back to the base station on a spurious-like echo carrier which is offset from a data carrier of the wireless system. The base station processes the transmit and receive time stamps to compute a first ranging value, receives corresponding second and third ranging values computed by two other system base stations which receive the echo carrier and its time stamp, and processes the first, second and third ranging values to determine a position vector indicative of the position of the mobile station. The base station then further processes the position vector to determine a bearing for the vector, and converts the result into latitude and longitude coordinates of the mobile station position. The silent echo generation circuit provides mobile position determination capability in the wireless system without significantly increasing the cost, size, weight and power consumption of the mobile station, without requiring a multilayer user interface, and without degrading system voice quality. [A2890]

"Radiotelephone proximity detector"

A radiotelephone proximity detector including a first proximity unit having a receiver and a second proximity unit having a transmitter, wherein the units can be coupled together and the coupling can be detected. One of the units is associated with a radiotelephone and the other with a user. When the units are coupled, they are responsive to the detection of their uncoupling, whereupon the transmitter of the second proximity unit transmits a proximity signal to the receiver of the first unit. The first proximity unit estimates the proximity of the radiotelephone and the user on the basis of the received proximity signal. Thus the two units operate together such that, when coupled, at least one of the units enters a standby mode, and when uncoupled, at least one of the units sends a proximity signal to the other unit. [A2891]

"Multichannel heterodyning for wideband interferometry, correlation and signal processing"

A method of signal processing a high bandwidth signal by coherently subdividing it into many narrow bandwidth channels which are individually processed at lower frequencies in a parallel manner. Autocorrelation and correlations can be performed using reference frequencies which may drift slowly with time, reducing cost of device. Coordinated adjustment of channel phases alters temporal and spectral behavior of net signal process more precisely than a channel used individually. This is a method of implementing precision long coherent delays, interferometers, and filters for high bandwidth optical or microwave signals using low bandwidth electronics. High bandwidth signals can be recorded, mathematically manipulated, and synthesized. [A2892]

"Method of moment estimation and feature extraction for devices which measure spectra as a function of range or time"

The computation system of the present invention comprises an improved method of moment estimation for devices which measure spectra as a function of range or time. The preferred embodiment of this system is illustrated as part of an automated meteorological monitoring system for the accurate real time detection of meteorological phenomena, such as winds, wind shear and turbulence. This automated meteorological monitoring system uses a standard weather radar transmitter to scan a predetermined volume of space with a stream of radar pulses to determine the characteristics of meteorological phenomena that are extant in the predetermined volume. The computation system of the present invention utilizes novel signal processing algorithms in the improved method of moment estimation to excise the valid data from the return echoes, which are corrupted by the presence of contaminating signals. Separating the valid data from the noise in this manner improves the responsiveness and accuracy of the system in which this method is implemented. [A2893]

"Obstacle detecting apparatus and vehicle occupant protecting device using the same"

An obstacle detecting apparatus which detects the distance between an obstacle and a vehicle by two distance measuring sensors, comprising collision angle calculating device in which a plurality of positions of the obstacle is calculated by way of triangulation on the basis of the distance information from the two distance measuring sensors, and a collision angle, which is formed between the obstacle and the vehicle, is calculated by the locus of the obstacle which is calculated by the calculated plurality of positions of the obstacle. [A2894]

"Traffic monitoring system"

A traffic monitoring system has a common housing for a Doppler radar transceiver, a video camera, and a digital computer for processing the Doppler signal. The system also includes a video cassette recorder, a high-speed photographic camera, and a laptop computer for downloading control settings and a program from a diskette or memory card to the digital computer. The digital computer performs an initial self-test by injecting a calibration signal in lieu of a Doppler signal into an electronic interface between the radar transceiver and the digital computer. The radar transceiver generates a Doppler signal having two channels, and the phase between the channels indicates whether a vehicle is approaching or receding from the radar transceiver. The two channels are recorded on the left and right audio channels of the video cassette. Recorded with the video signal is a push-down stack of speeds of vehicles detected on the system, in order to present a record of prevailing traffic conditions when prosecuting a speed violator. The recorded picture may also include a series of successive speed measurements for each vehicle. Although an operator could listen to the Doppler signal, it is preferred that the digital computer activates an audio annunciator to emit a click sound when the system detects a vehicle, and a warbly sound when a detected vehicle exceeds a specified speed limit. [A2895]

"Signal discriminator and positioning system"

A system is described for discriminating between a transmitted signal and background noise comprising a transmitter adapted to transmit a signal including first and second pulses, separated by a predetermined time interval, and a receiver including a pulse detector to detect pulses received from the transmitter, a delay circuit adapted to delay transmission of the first pulse for a predetermined period of time in communication with the detector to receive a pulse therefrom, and an and gate having an output, a first input in communication with the delay circuit and an second input in communication with the detector, the time of transmission between the pulses equaling the time delay of the delay circuit, whereby the and gate allows transmission of a signal only when simultaneously receiving pulses from the detector and the delay circuit. The system can be used in the determination of the distance between two points, or in the location of an object within an area, based upon calculation of the time between transmission of an initial signal and receipt of a return signal. [A2896]

"Vehicular radar apparatus"

Vehicular radar apparatus which enhances the accuracy of detection of a preceding vehicle and the reliability in tracking, by performing operations that use a normal distribution. for the purpose of obtaining a distance between one's own vehicle, on which the radar apparatus is mounted, and a target object, and obtaining a relative velocity from input data based on transmission and reception electromagnetic waves, this radar apparatus provided with a signal processing unit which has operation devices for performing an operation by applying normal distributions to frequencies of detection of the distance and the relative velocity and a target object recognition device for recognizing a target object on the basis of results of an operation to which the normal distributions are applied. The operation device is operative to establish a window corresponding to each target object, and obtain the frequencies of detection of the distance and the relative velocity correspondingly to each of plural data widths or sections of a probability density on a normal distribution curve, and establish a next window from data representing detected frequencies. The target object recognition device is operative to recognize target objects, each of which corresponds to a distance and a relative velocity that are within a same window, as different objects, but recognize target objects, each of which corresponds to a distance and a relative velocity that are not within a same window, as different objects as an identical object. [A2897]

"Method and system for detecting an in-path target obstacle in front of a vehicle"

A method and system for detecting a target obstacle in front of a vehicle traveling on a road includes a radar positioned at a center of the vehicle for transmitting radar waves ahead of the vehicle for use in determining a first position of the objects in front of the vehicle relative to the radar. A lane position measurement device determines a lateral deviation between the center of the vehicle and a lane boundary of the road. Control logic then determines a curvature of the road based on the lateral deviation, independent of the traveling path of the vehicle. The control logic then determines a second position of the objects based on the curvature of the road and the target obstacle based on the second position of the objects. [A2898]

"System for determining the spatial position of a target"

A system for determining the spatial position of a target having an active target adapted to emit energy in response to an active signal and a passive target adapted to reflect energy impinging upon such passive target from an active energy source. A common energy detector is provided for detecting both the energy emitted by the active target and the energy reflected by the passive target. A common processor is provided for determining the spatial positions of both the passive and active targets in response to the energy detected by the common detector. During a sensor cycle the spatial position of the active target is determined and during a sensor cycle the position of the passive target is determined. The sensor cycles may be interspersed or may be the same cycle to enable simultaneous determination of both the active target and the passive target during a single sensor cycle. The system also enables the determination of the spatial position and angular orientation of both a rigid object having affixed thereto active targets and/or another rigid object having affixed thereto passive targets and/or an object having affixed thereto both an active and passive targets. [A2899]

"Altimetric type measurement method for use on a satellite"

An altimetric type measurement method for use on a satellite transmits a pulse towards the surface of the sea and carries out frequency transformation on the return signal resulting from the reflection of this pulse at the surface of the sea. This produces a spectral signal of samples successively comprising: (a) --a first zone with a low amplitude level, (b) --a second zone with a sharply increasing slope ending at a peak, and (c) --a third zone of decreasing slope. Samples of the spectral signal are selected within a selection zone that corresponds to the first and second zones for a predetermined maximal level of the height of the waves at the surface of the sea and maximum likelihood processing is applied only to the selected samples. [A2900]

"Terrain bias compensator for doppler navigation systems"

A terrain bias compensator for a Doppler navigation system utilizes an auxiliary beam with each beam of the Doppler system to form Doppler beam pairs. The axis of the auxiliary beam is slightly offset from the axis of the main beam and is positioned so that the two axes are in the same vertical plane. After slant range compensation, the amplitudes of the Doppler spectrum of each beam is averaged over a predetermined time interval. The difference between the mean amplitudes of the two beams is divided by the offset angle to establish an amplitude per degree correction factor which is applied to the main beam signal returns to establish a main beam amplitude corrected Doppler spectrum. [A2901]

"Digitally-controlled pulse shaper for pulsed radar systems and radar wind profilers"

A digitally-controlled pulse shaper (DCPS) is provided which precisely controls the shape of the leading and trailing edges of a transmit pulse in a radar wind profiler, or pulsed-radar. In the case of pulse coding, where phase transitions are used to segment an otherwise longer pulse, the intra-pulse phase transitions are also shaped. [A2902]

"FMCW radar and method for estimating distance and relative velocity"

A relative distance and relative velocity to a target object is accurately estimated even if an error in slopes of the triangular wave modulation, that is unbalanced upward and downward slopes, or error in absolute values in an FMCW radar exists. A first distance estimator estimates a distance up to the target object based on a sum of a beat wave frequency generated between the upward and downward slopes of the triangular wave and an absolute value of an average frequency modulation factor which is a mean value of frequency modulation factors for the upward and downward slopes of the triangular wave, and a first velocity estimator estimates a relative velocity to the target object based on a time difference of the calculated distance. A tentative frequency modulation factor estimator estimates an absolute value of a tentative frequency modulation factor based on the calculated distance and velocity, and then estimates a more accurate relative velocity to the target object based on the estimated absolute value of the tentative frequency modulation factor and the distance calculated by the first distance estimator. [A2903]

"Automatic horizontal and vertical scanning radar with terrain display"

A weather radar and terrain map display system for aircraft with the terrain elevation and weather information displayed in an easy to read and comprehend presentation. The system includes an antenna for transmitting and receiving radar signals, a receiver for digitizing the reflected radar signals, and a computer for storing the signals and calculating the latitude and longitude coordinates of the locations from which the reflected radar signals were reflected, and for storing terrain elevation data. A display simultaneously shows a plan view image and vertical views of contoured terrain elevation data and the weather conditions found by the radar. The terrain and weather displays are superimposed over one another to enable quick and efficient location of critical terrain and weather conditions. The system can also calculate the latitude and longitude coordinates of the radar echoes without antenna stabilization. [A2904]

"Vehicle-mounted radar apparatus"

An arrangement is provided such that a time counter 5 starts counting an elapsed time after the lapse of a fixed time from the time the output of a beam reference-position detecting means 3 is turned on, such that an angle output value calculated by an angle-calculating means becomes 0 when the direction of a beam emitted from a radar head unit 2 has coincided with a frontal direction of the vehicle. [A2905]

"Radar based highway safety warning system"

A system for transmitting messages, such as safety hazard warning messages, to vehicles causes alerts to be generated in conventional radar detectors and more detailed messages to be provided to drivers with message capable radar receivers. The transmitted radar signal is modulated in frequency or phase or swept in frequency in different directions or at different rates to define the logical state of each bit of the message. A continuous wave (CW) maker signal may also be transmitted to assure detection by a conventional police radar detector and to allow a receiver capable of decoding messages to make adjustments that center an intermediate frequency (IF) generated from the received signal in the receiver IF passband. A message capable receiver decodes the modulated signal to communicate to the vehicle operator the contents of the transmitted message or a stored message corresponding to a transmitted code. The signal modulation is such that conventional radar detectors do not reject the signal but cause an alert to be generated, indicating to the driver the need to reduce vehicle speed to accommodate upcoming road conditions or obstacles. [A2906]

"Vehicles tracking transponder system and transponding method"

A vehicle-tracking radio transponder used in stolen vehicle recovery systems and in which the same transponder is also synergistically accessed for panic or emergency operator activation and for sensed unauthorized moving or starter circuit tampering independently of and without interfering with the stolen vehicle recovery command signal control of the transponder. [A2907]

"Ultra high resolution ranging unit"

A low cost, real time, remote sensor device for accurately measuring distance to an object with a resolution of 1 millimeter or better using phase information from either electromagnetic or acoustic energy. The device repetitiously transmits a swept frequency and decodes the resulting echo to produce a phase gate which is then converted to an accurate measurement of the range from each sweep. A method for measuring the time between two known phase points on a return signal is employed to determine the range measurement. Since the phase of the signal is used to determine range, the resolution is not dependent on bandwidth. [A2908]

"Vehicle steering force correction system"

A system for correcting the steering force of a vehicle having a steering wheel whose rotary motion exerted by a vehicle driver is converted into a turn motion of the steering wheels of the vehicle through a steering mechanism. The system is provided with sensors including a CCD camera for detecting the condition of the road ahead having at least one traffic lane on which the vehicle is traveling and a position of the vehicle with respect to the traffic lane. In the system the desired steering force is determined to be generated by the steering mechanism necessary for keeping the detected position of the vehicle with respect to the traffic lane based on the detected parameter and the steering mechanism is biased such that the steering mechanism generates the desired steering force. Conditions on the next adjacent lanes are monitored and the degree of danger is estimated to determine the biasing force. The system can be realized on muscular-energy steering systems or power-assisted steering systems. [A2909]

"Frequency domain processing of Doppler signals in a traffic monitoring system"

Frequency domain processing is used to determine rapidly whether false signals are present, and to improve the accuracy of speed measurements by rejecting speed measurements that could be inaccurate due to the presence of false signals. A Doppler signal responsive to speed of a moving vehicle is generated by a Doppler radar transceiver. A digital computer transforms the Doppler signal into a frequency domain signal such as an energy spectrum, and the speed of the moving vehicle is computed from the weighted arithmetic mean of the energy spectrum. The mean value, however, is rejected as an indication of speed if the variance of the energy spectrum from the mean exceeds a threshold, or if a differential of the spectrum with respect to frequency exceeds a threshold. The frequency domain processing of the present invention can also be used to reject certain bands of frequencies in the Doppler signal, such as bands of frequencies that differ from the mean value by more than a threshold, and the mean value can then be recomputed to provide an even better indication of the speed of the moving vehicle. Moreover, speed samples computed from successive frames of spectrum can be averaged, and the average value can be rejected as an indication of speed if the variance of the speed samples about the average value exceeds a threshold, or if the difference between successive speed samples exceeds a threshold. [A2910]

"Ground penetrating radar with synthesized end-fire array"

In a ground penetrating radar system, A-scan images of subsurface targets lying along the antenna boresight axis can be substantially improved and generated in real-time by employing a synthetic aperture, end-fire array, despite the inhomogeneous nature of the subsurface volume. The synthetic aperture, end-fire array is achieved by generating electromagnetic (EM) ultra-wideband impulses at a number of precise locations along the antenna boresight access, shifting the returned EM signals in the time domain according to the corresponding antenna boresight location, and then integrating the shifted, returned EM signals. [A2911]

"On-vehicle radar"

When a transmitted and received radio wave is scanned, even if, for example, a large vehicle is running on an adjacent lane, a preceding vehicle running on the same lane as an own vehicle can be sensed and tracked continually. An on-vehicle radar comprises a transmitter receiver 6 for transmitting and receiving a radio wave with a relatively high frequency, and a signal processor 10 calculating a relative distance to an object and a relative velocity of the object on the basis of a radio wave transmitted by the transmitter receiver, reflected from the object, and received by the transmitter receiver. The transmitter receiver controls the power of a transmitted radio wave so that when a radio wave is to be transmitted in any transmission direction other than a specified transmission direction, the power of the transmitted radio wave will be made lower than that of a radio wave to be transmitted in the specified transmission direction, or even if the power of a received radio wave is larger than a given value, the power of the transmitted radio wave will not be decayed, and that when a radio wave is to be transmitted in the specified transmission direction, if the power of a received radio wave is larger than the given value, the power of the radio wave transmitted by the transmitter receiver will be decayed. [A2912]

"Radio scanning system using acoustical surface waves (SW radio scanning system)"

A radio scanning system using acoustical surface waves (SW radio scanning system) includes a transceiver unit and sensor elements defining at least one parameter to be scanned. The transceiver unit has a transmitter transmitting question signals to the sensor elements and a receiver receiving and evaluating answer signals transmitted back by the sensor elements. The transmitter and the sensor elements are constructed in such a way that the question signals and the answer signals are chronologically inverse to one another. The sensor elements have different SW transit times. [A2913]

"System for displaying the characteristics, position, velocity and acceleration of nearby vehicles on a moving-map"

Proximity radar mounted in a vehicle determines the location of other vehicles. Other vehicles detect their own positions and broadcast those positions to all surrounding vehicles. Vehicle position data is plotted on a moving map so the driver can see the location of other vehicles, in some cases with an icon color which matches vehicle color (s) . A driver can open a communication link with drivers who are projected to constitute a collision threat. A fixed radar unit can be positioned at blind intersections and broadcast vehicle location information for vehicles not equipped with the ability to track their own locations. [A2914]

"Vehicle radar safety apparatus"

A vehicle radar safety apparatus employs a radar for detecting an object in front and/or to the rear and sides of a vehicle and for producing an indication of the distance and closing speed between the vehicle and the detected object. A signal processing unit sums the vehicle speed and the closing speed between the vehicle and detected object and compares the summed output with a signal corresponding to the distance between the vehicle and the detected object to provide an output to a display indicating the vehicle's capability of stopping prior to colliding with the detected object. The output from the signal processing unit is optionally applied to an accelerator and/or brake control circuit to automatically slow down the vehicle. A brake pedal override switch is connected to the accelerator and brake controls to override the accelerator and/or brake controls when the vehicle operator depresses the vehicle brake pedal. The radar includes a horn antenna having a plano-convex dielectric lens mounted at an exterior end. The lens has an exterior convex surface shaped to reduce side lobe generation of the transmitted radar wave so as to transmit a radar wave of a minimal beam width at a specified operating frequency and effective radar antenna diameter. [A2915]

"Electromagnetic wave, reflective type, low cost, active proximity sensor for harsh environments"

An electromagnetic, reflective type, active proximity sensor includes a transmitter, the transmitter including a voltage controlled oscillator circuit, a transmitter circular waveguide and a transmitter polarization circuit. The voltage controlled oscillator circuit generates an output signal which is modulated such that the frequency of the output signal varies over time between a range of frequencies. The frequency varying, output signal is provided to the transmitter circular waveguide and propagated to the transmitter polarization circuit where it is circularly polarized in a first circular direction. The circularly polarized, frequency varying, output signal is radiated by the transmitter to the target, where it strikes the target and reflects back toward the sensor to form return signals. The return signals, upon being reflected, rotate in a second circular direction opposite to the first circular direction. The return signals also respectively exhibit one of the frequencies corresponding to the range of frequencies associated with the circularly polarized, frequency varying, output signal. The active proximity sensor also includes a receiver, the receiver including a receiver circular waveguide, a receiver polarization circuit and a detector. The receiver circular waveguide receives the return signals reflected from the target and the receiver polarization circuit circularly de-polarizes the return signals. Next, the detector receives and averages the return signals and generates an output signal which corresponds to the return signals. The active proximity sensor also includes an analog processor/driver circuit for processing the output signal provided by the detector. [A2916]

"Apparatus and method for detecting a location and an orientation of an underground boring tool"

An apparatus and method for determining a location and an orientation of an underground boring tool by employment of a radar-like probe and detection technique. The boring tool is provided with a device which generates a specific signature signal in response to a probe signal transmitted from above the ground. Cooperation between the probe signal transmitter at ground level and the signature signal generating device provided at the underground boring tool results in accurate detection of the boring tool location and, if desired, orientation, despite the presence of a large background signal. Precision detection of the boring tool location and orientation enables the operator to accurately locate the boring tool during operation and, if provided with a directional capacity, avoid buried obstacles such as utilities and other hazards. The signature signal produced by the boring tool may be generated either passively or actively, and may be a microwave or an acoustic signal. Further, the signature signal may be produced in a manner which differs from that used to produce the probe signal in one or more ways, including timing, frequency content, information content, or polarization. [A2917]

"Micro motion sensor"

A microwave motion sensor for detecting multiple levels of motion of a target is disclosed. The motion sensor includes a transceiver for broadcasting a signal into a predetermined area and receiving a reflected signal with a receiver for producing first and second directional signals. A signal conditioning circuit is provided for amplifying the first and second directional signals and digitizing the directional signals. The signal conditioning circuit includes a micro motion amplifier for separately amplifying one of the directional signals and producing a micro motion signal. A processor is provided for receiving the first and second directional signals transmitted by the signal conditioning circuit, and for receiving the micro motion signal. The processor includes a circuit for analyzing the directional signals, and a circuit for comparing the micro motion signal to a threshold. The processor is capable of adaptively switching between a first mode for detecting a threshold level of motion, a second mode for detecting a level of motion which is less than the threshold level of motion, and a third mode for detecting a level of motion which is greater than the threshold level of motion. [A2918]

"Method and apparatus for detecting the presence of a child seat"

Method and system for detecting the presence of the child seat on a seat in which information about contents of the seat is obtained and a signal is generated based on any contents of the seat, a different signal being generated for different contents of the seat when such contents are present on the seat. The signal is analyzed in order to determine whether the contents of the seat include a child seat, and in a preferred embodiment, a child seat in a rear-facing orientation. Another system within the vehicle may be affected or controlled based on the determination of whether a child seat is present on the seat. The analysis of the signal is preferably by pattern recognition techniques that can recognize and thus identify the contents of the seat. [A2919]

"Method and apparatus for sensing piston position using a dipstick assembly"

A system for determining the position of a piston moveable within a cylinder, or of an implement or joint, is disclosed herein. Electromagnetic (EM) bursts such as ultra-wideband or frequency pulses are generated and applied to a transmitter/receiver unit. The EM bursts are launched by the transmitter along a transmission guide from an end of the cylinder housing towards the piston. The transmission guide can be a dipstick mounted within the cylinder housing or the cylinder housing itself. The dipstick or cylinder housing is in electrical communication with the piston such that a surface of the piston represents an electrical impedance discontinuity which causes the EM bursts to be reflected back to the receiver. The time for the EM bursts to travel from the transmitter to the piston and for the reflections to travel back to the receiver is determined and converted into a position signal representing the piston's position. A compensation signal can be used to compensate the position signal for variations in a parameter of the fluid within the cylinder such as dielectric constant caused by factors such as temperature, contamination and fluid type. The compensation circuit can include a pulse level analyzer, resonance circuit, capacitance circuit, compensation dipstick, or second transmitter/receiver circuit configured to measure the piston's position from the opposite end of the cylinder. [A2920]

"Ultra wideband receiver with high speed noise and interference tracking threshold"

An UWB receiver utilizing a microwave tunnel diode as a single pulse detector for short pulse, impulse, baseband or ultra wideband signals. The tunnel diode detector's bias point is set at system start-up, through an automatic calibration procedure to its highest sensitivity point relative to the desired bit error rate performance (based upon internal noise only) and remains there during the entire reception process. High noise immunity is achieved through the use of a high speed, adaptive dynamic range extension process using a high speed, Gallium Arsenide (GaAs) voltage variable attenuator (VVA) whose instantaneous attenuation level is determined by a periodic sampling of the ambient noise environment. Microprocessor-controlled detector time-gating is performed to switch the tunnel diode detector to the receiver front end circuitry for reception of an incoming UWB pulse, and alternately to ground through a resistor to discharge stored charge on the tunnel diode detector. In a second embodiment, two tunnel diode detectors are utilized in parallel, one biased for data detection and the other biased for noise detection, such that data detection can be interpreted based on simultaneous comparison to both a data threshold and a noise threshold. [A2921]

"Imaging radar suitable for material penetration"

A ground penetrating impulse radar system provides three-dimensional images of targets. A moving array of transmitting and receiving antennas provides narrow beamwidths and high gain by real and synthetic aperture beam processing. Narrow pulsewidth impulse signals are utilized to obtain high resolution. Round trip time is calculated for each three-dimensional pixel in a search volume, and is used to process three dimensional imagery. Analog to digital conversion can be utilized, so all signal processing is accomplished digitally. The radar system is applicable to detecting small objects near the surface by using very narrow pulses, and also can be applied to detect large, deep objects by wider pulses. [A2922]

"Observation instrument and remote control handle assembly"

A velocity/speed measurement radar unit incorporates a handle assembly for detachment from a base unit to allow for convertibility from a hand-held unit to a remote controlled radar unit. The removable handle assembly controls the operating parameters and secondary functions of the radar unit in a simple and user friendly manner. The operating parameters are established using multifunctional switches incorporated in the handle assembly, such as a trigger-type switch, rocker switches, and push button switches. The secondary functions are similarly controlled using a rotary encoder/push button switch combination. A microprocessor in the handle assembly receives inputs from the multifunctional switches and generates a corresponding control signal for transmission to the base unit. The handle assembly and base unit communicate via infra-red transmitters and receivers. The handle assembly is ergonomically designed to insure ease of use. The base unit is independently mounted when converted to the remote mode of operation. [A2923]

"Electromagnetic target generator"

The electromagnetic target generator of this invention is used to simulate radar target for the purpose of testing and experimenting on a variety of weapon systems radars. The weapon system radar being tested emits a radar signal which is received by the target generator. The target generator delays, doppler shifts, and reemits the signal for receipt by the weapon system antenna. The simulated target presented to the radar system under investigation has digitally controlled range, radial velocity, coordinated doppler and radar cross section. This provides a realistic radar target return without requiring real targets. The radar system is exercised in inflight and tactical operational configuration and no part of the weapons system radar is bypassed. Delayed radar target replicas are indistinguishable from real target waveforms. The electromagnetic target generator may be used in locations which preclude the use of real radar targets, such as anechoic chambers, and also may be used in the field. [A2924]

"Sensing with active electronic tags"

An object in a storage area or moving vehicle is monitored by attaching an electronic tag to the object. An electronic device detects the presence of the object by communicating with the tag while the object is in storage or is being moved by the vehicle. The tags may also determine the location of an attached object and may reroute the object if it deviates from a given shipping schedule. A group of objects is monitored by two electronic tags, each attached to an object in the group. Each tag has circuitry for communicating information relating to an object in the group to a second tag. Each tag also includes a memory connected to the circuitry that is capable of storing the information, and a controller connected to the memory and the circuitry. A sensor is used to detect the condition of an object and communicate the condition to a tag. [A2925]

"Radio frequency automatic identification system"

A radio frequency automatic identification system detects targets which include solid resonators resonating at several frequencies, attributing information to the frequencies at which the target resonates. Preferred resonators are quartz crystals, which may be made by a process of heating quartz to soften it and cutting crystals to approximate size and resonant frequency. Resonators produced by such a process are measured to determine their actual resonant frequency, and preferably the crystals are sorted into predetermined frequency windows in accordance with their measured resonant frequency. A set of resonators having frequencies corresponding to predetermined data is selected from the sorted groups of resonators and incorporated into a target. The preferred target is an ink-like material having a plurality of resonators disposed in a matrix which is radio frequency transparent at the frequency of interest. Targets are preferably detected by repetitively sweeping the frequency of the interrogating signal through a range which includes the information-bearing range of the system. [A2926]

"Method and apparatus for improved ranging"

A high resolution ranging method is described utilizing a novel modulated waveform, hereafter referred to as coherent burst modulation. In the coherent burst method, high frequency modulation of an acoustic or electromagnetic transmitter, such as a laser, is performed at a modulation frequency. This modulation frequency is transmitted quasi-continuously in the form of interrupted bursts of radiation. Energy from the transmitter is directed onto a target, interacts with the target, and the returning energy is collected. The encoded burst pattern contained in the collected return signal is detected coherently by a receiver that is tuned so as to be principally sensitive to the modulation frequency. The receiver signal is processed to determine target range using both time-of-flight of the burst envelope and phase shift of the high frequency modulation. This approach effectively decouples the maximum unambiguous range and range resolution relationship of earlier methods, thereby allowing high precision ranging to be conducted at arbitrarily long distances using at least one burst of encoded energy. Performance of such method and apparatus is significantly improved through use of phase alternation methods that compensate for non-ideal behavior of the ranging apparatus or of the target and its environment. Such phase alternation methods may be achieved by varying the phase of the transmitter or receiver channels. Moreover, methods for reduction of potential uncertainty in absolute range measurement are taught that make use of coherent signal components at twice the nominal modulation frequency. [A2927]

"Diode receiver for radio frequency transponder"

A passive radio frequency transponder (RF tag) having a diode rectifier receiver circuit outside the tag power rectification circuit, the tag power rectification circuit supplying power to the electronics of the RF tag. An additional innovative low current circuit protect the signal capacitor from overvoltage produced by the signal diode. An innovative circuit also clips the signal and sharpens it. An innovative low current circuit is used as a comparator to sharpen the signal pulses. [A2928]

"Doppler-based radar system self test circuit and related method"

A Doppler-based radar system used in monitoring the speed of moving vehicles includes a self test circuit and related method for independently and remotely testing the operability of the entire radar system including the critical microwave components. The self test circuit includes a low frequency modulation diode positioned adjacent the antenna horn. The modulating diode causes a change in the voltage standing wave ratio seen by the radar system (s) , thereby modulating the energy of the reflected radar test signal. The modulated test signal is compared to the original test signal and a resultant control signal is generated. The radar system is combined with a retarder system controller and a control system computer to provide an industrial control application, such as for controlling railway cars in a hump yard. Any number of additional radar systems/retarder system controllers can be added to expand the application. [A2929]

"Submerged object detection and classification system"

A detection and classification system for underwater objects uses a transting unit and a receiving unit. The transmitting unit comprises a waveform generator, a power amplifier, and a transmitting antenna. The receiving unit comprises a receiving antenna, a pre-amplifier, a first harmonic suppressor, a digitizer, and a computer. The transmitting unit radiates an analog electromagnetic wave signal into a conductive medium such as seawater which the receiving unit detects and analyzes by a differential spectral analysis after conversion of the signal into binary code. The system uses a signal-processing method which includes the steps of determining the size of the underwater object to be detected, transmitting an electromagnetic wave with a wavelength proportioned to the size of the object, performing a spectral analysis of the received signal, performing a spectral analysis at a different time or different location, comparing the two spectra performed, and analyzing the difference between the two spectra. [A2930]

"Process for monitoring traffic for automatic vehicle incident detection"

A process for monitoring traffic for automatic vehicle incident detection using radar waves to detect the vehicles, their instantaneous speed and their distance. The process consists in correlating the information obtained regarding vehicles in one and the same distance bracket during two consecutive processing time intervals, so as to determine, at each instant, the acceleration of each vehicle and a prediction of its speed, and in then detecting an incident in a distance bracket by detecting the passing of the speed of a vehicle below a given speed threshold. The advantages of the process resides in rapid incident detection in regard to a road or motorway network, with a view to informing the users rapidly. [A2931]

"Ultra-wideband impedance sensor"

The ultra-wideband impedance sensor (UWBZ sensor, or Z-sensor) is implemented in differential and single-ended configurations. The differential UWBZ sensor employs a sub-nanosecond impulse to determine the balance of an impedance bridge. The bridge is configured as a differential sample-and-hold circuit that has a reference impedance side and an unknown impedance side. The unknown impedance side includes a short transmission line whose impedance is a function of the near proximity of objects. The single-ended UWBZ sensor eliminates the reference side of the bridge and is formed of a sample and hold circuit having a transmission line whose impedance is a function of the near proximity of objects. The sensing range of the transmission line is bounded by the two-way travel time of the impulse, thereby eliminating spurious Doppler modes from large distant objects that would occur in a microwave CW impedance bridge. Thus, the UWBZ sensor is a range-gated proximity sensor. The Z-sensor senses the near proximity of various materials such as metal, plastic, wood, petroleum products, and living tissue. It is much like a capacitance sensor, yet it is impervious to moisture. One broad application area is the general replacement of magnetic sensors, particularly where nonferrous materials need to be sensed. Another broad application area is sensing full/empty levels in tanks, vats and silos, e.g., a full/empty switch in water or petroleum tanks. [A2932]

"Informational/training video system"

The present invention provides a video-based, combined informational/training system for user activity related applications. In one embodiment, the system (2) includes a video recording assembly (10) and a measuring device (4) located at a user activity site (6) such as a tee box of a golf driving range. A video tape (60) , including activity specific information on a first, pre-recorded portion thereof, is provided to the user for use in the video recording assembly (10) at the user activity site (6) . The video tape (60) is cued for recording user specific information on a second portion of the video tape (60) during a practice session. The sensor (4) determines corresponding parameter information, such as estimated golf ball carry distance, for display on video tape (60) . The video tape (60) and video recording assembly (10) cooperate to provide a mechanism for preventing or discouraging use of unauthorized tapes and to ensure proper usage of the system (2) . [A2933]

"Vehicle steering control system including corrections for map position and detected obstacles"

An azimuth change quantity .theta. of a road during traveling of a vehicle for a time .delta.t is calculated based on road data provided by a navigation system and a vehicle speed provided by a vehicle speed sensor (at step S3 in FIG. 2) . On the other hand, an azimuth change quantity .THETA. of the vehicle is calculated by integrating a yaw rate .gamma. obtained from a yaw rate sensor over the time .delta.t (at step S5) . A deviation D between the azimuth change quantity .theta. of the road and the azimuth change quantity .THETA. of the vehicle is calculated (at step S6) . When the deviation D becomes equal to or larger than a reference value .beta., it is determined that there is a possibility that the vehicle will depart from the road (at step S9) , and a predetermined steering torque is applied to a steering device, so that the deviation is converged into zero (at steps S10 and S11) . [A2934]

"Vehicle steering control system including corrections for map position and inter-vehicle distance"

An azimuth change quantity .theta. of a road during traveling of a vehicle for a time .delta.t is calculated based on road data provided by a navigation system and a vehicle speed provided by a vehicle speed sensor (at step S3 in FIG. 2) . On the other hand, an azimuth change quantity .THETA. of the vehicle is calculated by integrating a yaw rate .gamma. obtained from a yaw rate sensor over the time .delta.t (at step S5) . A deviation D between the azimuth change quantity .theta. of the road and the azimuth change quantity .THETA. of the vehicle is calculated (at step S6) . When the deviation D becomes equal to or larger than a reference value .beta., it is determined that there is a possibility that the vehicle will depart from the road (at step S9) , and a predetermined steering torque is applied to a steering device, so that the deviation is converged into zero (at steps S10 and S11) . [A2935]

"Noise pair velocity and range echo location system"

An echo-location method for microwaves, sound and light capable of using incoherent and arbitrary waveforms of wide bandwidth to measure velocity and range (and target size) simultaneously to high resolution. Two interferometers having very long and nearly equal delays are used in series with the target interposed. The delays can be longer than the target range of interest. The first interferometer imprints a partial coherence on an initially incoherent source which allows autocorrelation to be performed on the reflected signal to determine velocity. A coherent cross-correlation subsequent to the second interferometer with the source determines a velocity discriminated range. Dithering the second interferometer identifies portions of the cross-correlation belonging to a target apart from clutter moving at a different velocity. The velocity discrimination is insensitive to all slowly varying distortions in the signal path. Speckle in the image of target and antenna lobing due to parasitic reflections is minimal for an incoherent source. An arbitrary source which varies its spectrum dramatically and randomly from pulse to pulse creates a radar elusive to jamming. Monochromatic sources which jigger in frequency from pulse to pulse or combinations of monochromatic sources can simulate some benefits of incoherent broadband sources. Clutter which has a symmetrical velocity spectrum will self-cancel for short wavelengths, such as the apparent motion of ground surrounding target from a sidelooking airborne antenna. [A2936]

"Multi-sensor anticipatory object detection system"

A multi-sensor anticipatory object detection system for detecting the instantaneous range, relative velocity, collision angle and point of impact of a colliding object includes a plurality of transducer devices angle a fixed distance in which each said transducer device transmits a modulated carrier signal and receives the reflected modulated carrier signal from an object, a detection device for detecting a plurality of Doppler shifted harmonic components from each said reflected signal, a range determining device, responsive to the amplitudes of said harmonic components, for determining the instantaneous range of said object from each said transducer device, a velocity measurement device, responsive to the frequency of said harmonic components, for determining the relative instantaneous velocity of said object, and an impact decision device, responsive to said range determining device and the velocity measurement device, for determining where, if at all, impact with the object will occur and the angle of the impact prior to impact with the object. [A2937]

"Removing buoy motion from wind profiler moment"

The present invention provides an apparatus and method for correcting buoy motion in Doppler moment estimates. In the present invention, it is assumed that the buoy is stationary over short periods of time, 0.5 seconds for example. The average pitch and roll angles are measured for the 0.5 second period. A short-term Doppler spectrum for a particular beam is computed and stored along with the corresponding average pointing angle. This short-term Doppler spectrum must be averaged with many others to be able to detect the clear air signal. To correct for motion broadening, the present invention shifts each short Doppler spectrum some number of velocity bins before averaging them together. This shifting scales the measured radial velocity at some measured pointing angle to the radial velocity that would have been measured if the antenna was pointing at some initial pointing angle, typically the steering angle if the antenna was level. The wind velocity derived from the average 30 second Doppler spectrum without shifting is used as a first guess. The equations are solved iteratively until spectral width is minimized. [A2938]

"Level gage waveguide process seal having wavelength-based dimensions"

A waveguide assembly for a process sealed level gage includes first and second waveguide portions, a process sealing cavity and a mechanical barrier. The first waveguide portion has a first waveguide bore. The second waveguide portion is fastened to the first waveguide portion and has a second waveguide bore which is axially aligned with the first waveguide bore for communicating microwave signals at a waveguide wavelength .lambda..sub.G between the waveguide bores. The process sealing cavity is formed at an interface between the first and second waveguide portions. The mechanical barrier includes a first shaft section positioned within the first waveguide portion, a second shaft section positioned within the second waveguide portion and a raised annular shoulder positioned at the interface, within the process sealing cavity. The raised annular shoulder has a width, which is measured radially outward from an outside diameter of the shaft sections, of approximately 1/2 .lambda..sub.G and a height, which is measured axially between the first and second waveguide portions, of approximately 1/4 .lambda..sub.G. [A2939]

"Moving target indicator with no blind speeds"

A moving target indicating system wherein a pulse source which generates radiofrequency drive pulses at a predetermined pulse repetition frequency is connected to the inputs of a pair of channels. The first channel includes a phase-dispersive filter having a first phase-slope dispersion characteristic, while the second channel has a phase-dispersive filter having a phase-slope dispersion characteristic which is the negative of that of the first filter. A pulse group comprising the output of the first and the second channels is transmitted periodically as each drive pulse is applied. The pulse repetition frequency is sufficiently low that when transmitted, echos of only one pulse of each group are received at a time. Due to the "matched" or "conjugate" phase-dispersive characteristics of the filters in the respective channels, the first channel operates in reception upon the reflected pulse originally generated in the second channel and compresses it thus resynthesizing or reconstituting a short duration pulse like the original, while the second channel operates in reception upon the reflected pulse generated in the first channel, compressing it to reconstitute a short duration pulse like the original. A canceler is switched between the outputs of the first and second channels to receive the two resulting reconstituted pulses of each group. In the usual application, fixed target information is cancelled out and moving target information is derived for application to a display device. [A2940]

"Method and system for determining a modulus of speed of a carrier of radar"

A method and system for determining a modulus of a speed of movement of a carrier of radar, including (a) illuminating a same zone on the ground laterally, with radar of the carrier, at times t.sub.1 and t.sub.2 , (b) measuring respective distances D.sub.1 and D.sub.2 of the carrier to the same zone at the times t.sub.1 and t.sub.2, and Doppler frequency shifts F.sub.d1 and F.sub.d2 of respective echoes returned by the same zone during the times t.sub.1 and t.sub.2 , and (c) deducing the modulus .vertline.V.sub.h .vertline. of the speed of movement of the carrier based on a relationship ##EQU1## with .lambda. being a wavelength of a radar wave transmitted by the radar. The method and system require neither the locking of the radar to the carrier nor a course drift of the carrier. In this way, precision is improved and it possible to obtain accurate imaging radar modes having images in which distances can be measured with precision. The method and system can use results obtained during radar imaging for calculating the modulus of the speed of movement of the carrier. [A2941]

"Digital synchronization of broadcast frequency"

A dynamic, self adjusting synchronization system for real time control of the frequency and bandwidth of a modulated signal includes a voltage controlled oscillator for generating a carrier signal to be modulated having a predetermined frequency and bandwidth. There is an adjustment device having a center frequency adjustment circuit for providing a voltage level to the voltage controlled oscillator. A modulation generator generates a modulation signal for modulating the carrier signal to produce a modulated carrier signal and a co-generated measurement signal synchronized with the modulation signal. There is a device for selectively inhibiting the modulation signal. A measurement device includes a counter device to selectively count the pulses of the modulated carrier signal for a first predetermined period of time and counting the pulses of the carrier signal for a second predetermined period of time while the modulation signal is inhibited and a measurement circuit, responsive to the co-generated measurement signal, to synchronously define the first predetermined period of time during which the modulated carrier pulses are counted and is responsive to a timing signal to define the second predetermined period of time during which the modulation signal is inhibited for counting the carrier pulses. The adjustment device is responsive to the measurement device, for varying the voltage applied to the voltage controlled oscillator to maintain the predetermined frequency of the carrier signal, and is responsive to the measurement device for varying the voltage applied to the voltage controlled oscillator to maintain the predetermined bandwidth of the modulated carrier signal. [A2942]

"Common transmit module for a programmable digital radio"

A common transmit module of a programmable digital radio has a digital submodule which receives a bit stream and produces a modulated IF signal, and an analog submodule which receives the modulated IF signal and converts the modulated IF signal to a frequency corresponding to a specific type of radio function. The digital submodule includes (a) a sequential/parallel instruction set processor for signal processing and control, (b) a reconfigurable format unit, and (c) a modulator which receives the output signals of the reconfigurable format unit and produces the modulated oscillation signal. The analog submodule includes (a) a tunable local oscillator that produces a tunable local oscillation signal, (b) fixed local oscillators that produce fixed local oscillation signals, and (c) a mixing unit that receives the modulated IF signal, the tunable local oscillation signal and the fixed local oscillation signals, selectively mixes the fixed local oscillation signals with the modulated oscillation signal to produce non-final IF signals, and mixes a non-final IF signal with the tunable local oscillation signal to produce a final converted signal for transmission at the frequency corresponding to the specific type of radio function. [A2943]

"Incremental phase and distance measurement through digital phase signature comparison"

A displacement measuring method that measures phase changes between a reference and a phase-shifted signal from -.infin. to .infin. degrees (limited by the size of counters) in precise incremental steps using a method referred to as Digital Phase Signature Comparison. Digital Phase Signature Comparison uses an n-bit digital pulse train synchronized to a reference signal to sample a binary phase-shifted signal of a known duty cycle. This n-bit sampling creates a unique phase signature which is stored in a memory device. One digital n-bit phase signature is created for each synchronized pulse train. Each stored phase signature is compared with the previous phase signature to determine whether the phase of the phase-shifted signal has changed, the magnitude of that change, and the direction of displacement. Error detection can protect against unknown phase signatures and phase signature transitions, thus ehminating accumulated or incident inaccuracies. [A2944]

"Swept-step radar system and detection method using same"

An apparatus and method for detecting an object and determining the range of the object is disclosed. A transmitter, coupled to an antenna, transmits a frequency-modulated probe signal at each of a number of center frequency intervals or steps. A receiver, coupled to the antenna when operating in a monostatic mode or, alternatively, to a separate antenna when operating in a bistatic mode, receives a return signal from a target object resulting from the probe signal. Magnitude and phase information corresponding to the object are measured and stored in a memory at each of the center frequency steps. The range to the object is determined using the magnitude and phase information stored in the memory. The present invention provides for high-resolution probing and object detection in short-range applications. The present invention has a wide range of applications including high-resolution probing of geophysical surfaces and ground-penetration applications. The invention may also be used to measure the relative permittivity of materials. [A2945]

"Vehicle travel aiding device"

A vehicle travel aiding device for sensing running conditions of the vehicle and outputting vehicle travel supporting information, which is featured by detecting ambient circumstances and road conditions on which the vehicle is and operating driver's brake operation response on accelerator release response and changing the outputting timing or the content of the supporting information according to the detection results. [A2946]

"Method and apparatus for controlling the approach of a vehicle to an obstacle"

In a first distance range to the obstacle, the velocity of the vehicle is limited by the control of the power of the drive unit of the vehicle. In a second distance range which is less than said first distance range, the braking force at the wheel brakes is built up. [A2947]

"Poly-frequency CW doppler radar system with leakage cancellation and method"

A single antenna poly-frequency Continuous Wave (CW) Doppler radar system having leakage cancellation. The system provides for transmitting a plurality of carrier frequency signals and receiving the return signals by means of a single antenna coupled to an antenna interface through which a portion of the transmitted signal may leak. The signal appearing on an output port of the antenna interface is then down-converted to an intermediate frequency (IF) signal by a stable mixing signal. The IF signal is coupled to an adder which in turn is coupled to an output. The IF signal is further split into a pair of cancellation loops for each carrier frequency signal. Each cancellation loop includes a correlator and provides for processing the IF signal with an in-phase or a quadrature-phase signal associated with the carrier frequency signal so that each pair of cancellation loops outputs a feedback signal representative of and equal to the amplitude of the leakage signal only, which feedback signal then being subtracted from the IF signal with the resultant return signal less the leakage signal then being transmitted for further processing. Preferably, a second order linear feedback circuit and phase compensation circuit is provided in each cancellation loop for processing of the IF signal. The disclosed system does not require high precision, high cost oscillators and has particular application in military radars, navigation radars and vehicular collision warning radars. [A2948]

"Common receive module for a programmable digital radio"

A digital submodule is included in a software programmable common receive module for receiving IF signals and producing a serial bit stream. The digital submodule is programmable based on a selected application of a plurality of radio applications and, if present, a selected function of a plurality of functions of the selected radio application. The digital submodule may include an analog to digital converter for converting IF signals received from an analog submodule into digital signals. The digital signals are supplied to a programmable signal processing unit which is configured, according to the selected radio application and, if present, the selected function, to perform control functions, processing and analysis of the digital signals and generate output signals. The output signals are then formatted by a formatting unit producing formatted digital signals. The formatted digital signals are then supplied to a system bus. The programmable signal processing unit may include a digital downconverter for selective use depending on the selected application of radio communication, for generating a base signal. Additionally, a central processing unit is included to perform further signal processing for selected radio application. [A2949]

"Motor vehicle display system and ranging device"

The state of motion of a motor vehicle is indicated to a driver of a following vehicle by employing an array of lamps. The state of motion is determined by sensing vehicle velocity, deceleration being measured either directly via a transducer or being derived from measured velocity. When the subject vehicle is determined to be stationary, the lamps are illuminated in a time dependent sequence to produce an animated visual display in which the lamps are illuminated and selected pairs of lamps are sequentially de-actuated to provide a pattern cyclically moving outwardly from the center to both left and right ends of the array. The approach of the following vehicle to within a pre-set distance of the stationary vehicle is sensed and triggers a change in the display to a static visual display in which an outer pair of lamps remain illuminated. During deceleration, the level of deceleration is indicated by illuminating progressively more lamps with increasing deceleration. [A2950]

"Vehicle steering control system using navigation system"

An azimuth change quantity .theta. of a road during traveling of a vehicle for a time .delta.t is calculated based on road data provided by a navigation system and a vehicle speed provided by a vehicle speed sensor (at step S3 in FIG. 2) . On the other hand, an azimuth change quantity .THETA. of the vehicle is calculated by integrating a yaw rate .gamma. obtained from a yaw rate sensor over the time .delta.t (at step S5) . A deviation D between the azimuth change quantity .theta. of the road and the azimuth change quantity .THETA. of the vehicle is calculated (at step S6) . When the deviation D becomes equal to or larger than a reference value .beta., it is determined that there is a possibility that the vehicle will depart from the road (at step S9) , and a predetermined steering torque is applied to a steering device, so that the deviation is converged into zero (at steps S10 and S11) . [A2951]

"Sensor fusion apparatus and method"

The invented apparatus fuses two or more sensor signals to generate a fused signal with an improved confidence of target existence and position. The invented apparatus includes gain, control and fusion units, and can also include an integration unit. The integration unit receives signals generated by two or more sensors, and generates integrated signals based on the sensor signals. The integration unit performs temporal and weighted spatial integration of the sensor signals, to generate respective sets of integrated signals supplied to the gain control and fusion units. The gain control unit uses a preprogrammed function to map the integrated signals to an output signal that is scaled to generate a gain signal supplied to the fusion unit. The fusion unit uses a preprogrammed function to map its received integrated signals and the gain signal, to a fused signal that is the output of the invented apparatus. The weighted spatial integration increases the fused signal's sensitivity to near detections and suppresses response to detections relatively distant in space and time, from a detection of interest. The gain control and fusion functions likewise suppress the fused signal's response to low-level signals, but enhances response to high-level signals. In addition, the gain signal is generated from signals integrated over broad limits so that, if a detection occurred near in space or time to a detection of interest, the gain signal will cause the fused signal to be more sensitive to the level of the detection of interest. [A2952]

"Vehicle occupant position and velocity sensor"

An occupant position sensor utilizing either ultrasonic, microwave or optical technologies, or seatbelt spool out and seat position sensors, are used as inputs to the primary vehicle crash sensor circuit to permit the longest possible sensing time before the occupant gets proximate to the airbag and is in danger of being injured by the deploying airbag. The sensor further disables the inflatable restraint system if the occupant is in danger of being injured by the system deployment. Separate systems are used for the driver and passenger to permit the optimum decision to be made for each occupant. [A2953]

"Velocity detecting system"

A velocity detecting radar unit that is easy to operate and to view so as to minimize distraction to the operator, particularly when in use in a moving vehicles includes a spotlight unit having a housing with a lens, a light source within the housing and a control wand pivotally mounting the housing for rotation about an axis and including an elongated tube adapted to extend through the windshield pillar of a vehicle. A radar antenna is mounted in the housing to be movable therewith and has a radar transmitting and receiving end extending from the housing oppositely of the spotlight lens. A display module is adapted to display velocity data and other information and is adjustable mounted to the tube at a location thereon remote from the spotlight housing. Similarly, an input or control module including function switches for providing function commands to a controller for the unit is provided and is adjustable mounted to the tube at a location thereon remote from the housing. [A2954]

"Electronic baffle and baffle controlled microwave devices"

Microwave devices incorporate at least one photosensitive baffle that is selectively illuminated changing the baffle's electronic characteristic from being transparent to being reflective of microwave energy. The baffle serves as a gate, tuning element, reflector and the like. Various forms of photosensitive baffles and microwave devices are presented. [A2955]

"Vehicle data acquisition system"

A data acquisition system is disclosed where a first communication device transmits a transmitted signal to a second communication device. The second communication device encodes the transmitted signal with a code generating a retransmitted signal. The retransmitted signal is then transmitted back to the first communication device. The code can be indicative of an environmental element, such as a traffic sign. The first communication device can determine a distance to the environmental element by monitoring a time for the retransmitted signal to arrive. The first communication device can also encode the transmitted signal with information, such as voice for example. [A2956]

"Optical identification and monitoring system using pattern recognition for use with vehicles"

A vehicle interior monitoring system to identify, locate and monitor occupants, including their parts, and other objects in the passenger compartment and objects outside of a motor vehicle, such as an automobile or truck, by illuminating the contents of the vehicle and objects outside of the vehicle with electromagnetic, and specifically infrared, radiation and using one or more lenses to focus images of the contents onto one or more arrays of charge coupled devices (CCD arrays) . Outputs from the CCD arrays, are analyzed by appropriate computational means employing trained pattern recognition technologies, to classify, identify or locate the contents or external objects. In general, the information obtained by the identification and monitoring system is used to affect the operation of some other system in the vehicle. When system is installed in the passenger compartment of an automotive vehicle equipped with an airbag, the system determines the position of the vehicle occupant relative to the airbag and disables deployment of the airbag if the occupant is positioned so that he/she is likely to be injured by the deployment of the airbag. [A2957]

"Electronic equipment for prevention of collisions between vehicles"

An electronic encoder/transmitter encodes acoustic and visual signal pulses for transmission to other vehicles. A device transmits alarm signals instantaneously when the vehicle self collides, becomes blocked in the road, or when the vehicle is on a collision course with another vehicle. The device receives signals from sensors and enters a function to send an encoded radio signal via an antenna. A manual switch may also be used. Signals received by the decoder/receiver may be visualized by colored LEDs placed at a front panel. The transmitted signal is sent to all vehicles driving in the immediate area. The present invention includes acoustic and visible pulses to warn of risks and collisions which may happen in a short distance and not be visible between the vehicles. The present invention also includes an alarm placed on all four sides of the vehicle and connected to an automatic hydroelectric brake system for reducing the speed of the vehicle. An automatic horn is also included, as well as a manual alarm for crossroad proximity. [A2958]

"Traveling-path deduction apparatus and method for vehicles"

A traveling-path temporary-setting unit 21 sets a plurality of temporary traveling paths with different curvatures, and a calculation unit 22 calculates distances between the temporary traveling paths and preceding vehicles detected by a radar unit 1. In case of a properly-set temporary traveling path, the path and running loci of the preceding vehicles are on a concentric circle. In this case, the preceding vehicles are running along this temporary traveling path, and a time change amount of calculated distances is approximately "0". A traveling-path determination unit 23 determines, one temporary traveling path having the minimum time change amount in the distances, as a traveling path of the vehicle. [A2959]

"Identification mark operating with acoustic surface waves"

An identification mark operating with acoustical surface waves includes at least one reflector having higher reflectivity than a reflectivity of other reflectors. [A2960]

"System and method for intelligent cruise control using standard engine control modes"

A system and method for implementing an intelligent cruise control using standard engine control modes includes a distance sensor to determine the distance and closing rate relative to a forward vehicle and use this information to implement a distance control mode and a speed control mode. The distance control mode maintains a selectable headway range relative to a forward vehicle and may include accelerating the vehicle or decelerating the vehicle by defueling, engaging an engine brake, or downshifting the transmission when engine speed permits. The speed control mode maintains a selectable cruising speed if no target vehicle is detected. This cruising speed set point also functions as an upper limit while in the distance control mode. The system and method effect the intelligent cruise control functions utilizing control logic external to the electronic engine control module utilizing the engine speed control mode or engine speed and torque limiting control mode of SAE J1922 or SAE J1939 standards. Alternatively, a cruise control limit speed may be broadcast via SAE J1587 to reduce the vehicle speed upon approaching a forward vehicle so as to reduce the need for driver intervention. The invention may periodically switch between engine control modes to avoid any control mode timeout imposed by some engine manufacturers. [A2961]

"Motor vehicle display system and ranging device"

A display system for motor vehicles provides an array of lamps at the rear of a subject vehicle to provide an indication of the state of motion of the subject vehicle to the driver of a following vehicle. In a first mode of operation, the display indicates a level of warning dependent upon the rate of deceleration of the subject vehicle, the level of warning being determined by deceleration thresholds which are variable in dependence upon the measured speed of the subject vehicle. In a second mode of operation, the lamps provide an indication of the subject vehicle being stationary or near stationary as determined by comparing the measured speed with a threshold speed. An animate display is created by illuminating the lamps and sequentially deactuating selected pairs of lamps to create a pattern cyclically moving semetrically outwardly from the center of the row. The display is discontinued when the speed of the subject vehicle exceeds a second threshold defined independently of the first threshold speed. In a third mode of operation, the display indicates that the subject vehicle is stationary or near stationary in a manner which has less prominence, fewer lamps being illuminated, and in response to detection of a following vehicle being in close proximity to the subject vehicle. [A2962]

"Transmission-reception time correction system"

The invention relates to a transmission-reception system. A transponder receiver unit contained in the key bow of an ignition key has a power circuit that receivers, rectifies and smoothes the carrier wave signal transmitted together with a time reference signal and an enquiry signal from the transmission-reception ECU of a motor vehicle. A microcomputer in the transponder becomes active when the output voltage of the power circuit reaches a predetermined level or higher. When activated, the microcomputer measures the time length of the received reference time signal using the clock signal generated by an oscillation circuit, and calculates a ratio, as a correction coefficient, between the measured time length and a stored reference time value. The microcomputer decodes the enquiry signal while correcting the time information included in the time series pulse signal forming the enquiry signal, using the correction coefficient. [A2963]

"System for preventing rear end collisions"

A system for preventing rear end collisions is provided including a warning light housing with a transparent panel mounted to a rear of the vehicle. A distance detector is directed toward a rear of the vehicle. The distance detector is adapted to detect a distance from a following car. A bulb is provided for illuminating upon the actuation thereof.

Finally, control circuitry is connected between the distance detector, bulb, a speedometer, and a battery of the vehicle. The control circuitry is adapted for receiving a speed of the vehicle from the speedometer and further to calculate a distance per speed value, whereby the control circuitry actuates the bulb only upon the distance per speed value being lower than a predetermined value. [A2964]

"Anti-theft system for a motor vehicle"

An anti-theft system for a motor vehicle includes a transceiver disposed in a motor vehicle and a portable transponder. If a magnetic alternating field of the transceiver is turned on, energy signals are transmitted inductively to the transponder, where they charge an energy storing device. As soon as the alternating field is turned off, a transponder oscillating circuit oscillates at its resonant frequency. This oscillation is transmitted inductively back to the transceiver. In the process, the resonant frequency is measured. Then, the exciter frequency of the alternating field is adapted to the resonant frequency of the transponder, so that the inductive energy transmission is as effective as possible in subsequent charging operations. [A2965]

"Mines having tuned passive electromagnetic reflectors to enhance radar detection"

Metal structures that are resonant to electromagnetic waves are combined h land mines to make them easier to detect using Ground Penetrating Radar. Knowledge of the resonant characteristics in the metal structures enhances detection and identification. [A2966]

"Optical identification and monitoring system using pattern recognition for use with vehicles"

A vehicle interior monitoring system to identify, locate and monitor occupants, including their parts, and other objects in the passenger compartment and objects outside of a motor vehicle, such as an automobile or truck, by illuminating the contents of the vehicle and objects outside of the vehicle with electromagnetic, and specifically infrared, radiation and using one or more lenses to focus images of the contents onto one or more arrays of charge coupled devices (CCD arrays) . Outputs from the CCD arrays, are analyzed by appropriate computational means employing trained pattern recognition technologies, to classify, identify or locate the contents or external objects. In general, the information obtained by the identification and monitoring system is used to affect the operation of some other system in the vehicle. When system is installed in the passenger compartment of an automotive vehicle equipped with an airbag, the system determines the position of the vehicle occupant relative to the airbag and disables deployment of the airbag if the occupant is positioned so that he/she is likely to be injured by the deployment of the airbag. [A2967]

"Ultra wideband ground penetrating radar imaging of heterogeneous solids"

A non-invasive imaging system for analyzing engineered structures comprises pairs of ultra wideband radar transmitters and receivers in a linear array that are connected to a timing mechanism that allows a radar echo sample to be taken at a variety of delay times for each radar pulse transmission. The radar transmitters and receivers are coupled to a position determining system that provides the x,y position on a surface for each group of samples measured for a volume from the surface. The radar transmitter and receivers are moved about the surface, e.g., attached to the bumper of a truck, to collect such groups of measurements from a variety of x,y positions. Return signal amplitudes represent the relative reflectivity of objects within the volume and the delay in receiving each signal echo represents the depth at which the object lays in the volume and the propagation speeds of the intervening material layers. Successively deeper z-planes are backward propagated from one layer to the next with an adjustment for variations in the expected propagation velocities of the material layers that lie between adjacent z-planes. [A2968]

"Roadway ground penetrating radar system"

A roadway ground penetrating radar system is provided for generating a continuous profile of the pavement structure. The profile shows individual layer and sub-surface anomaly depth and thickness. Radar signals are transmitted into the structure using a surface-coupled transmitter antenna and reflected waves are received by an array of surface-coupled receiver antennas located at different known spacings from the transmitter antenna. The different signal travel times are measured. An accurate measure (.+-.5%) of signal velocity through each pavement layer can be calculated using the surface-coupled assembly spacing and travel time information. With the velocity accurately known at each sounding point, using conventional calculations one can determine interface depth and layer thickness, to an accuracy in the order of .+-.5%. In a preferred embodiment, an air-launched "horn" antenna assembly is used in conjunction with the surface-coupled antenna assembly. The horn antenna assembly gives good resolution for layer thicknesses of about 50-100 mm, the surface-coupled antenna assembly gives good resolution for layer thicknesses greater than about 100-150 mm, and gives greater penetration depth. The system can be wheel mounted for advancing continuously along the roadway and the radar data can be synchronized with roadway location. [A2969]

"Method and apparatus for crash sensing using anticipatory sensor inputs"

Anticipatory crash sensors mounted on the front of a vehicle or optionally on the sides sense the speed of approach to an obstacle. A signal processing algorithm determines the ratio of the speed to a threshold and multiplies the output of an accelerometer with the ratio. This enhanced acceleration signal is input to a single point crash sensor algorithm to reduce the time to generate a trigger signal. [A2970]

"Vehicle interior identification and monitoring system"

This invention is a system to identify and monitor contents and/or parts of the passenger compartment of a motor vehicle, such as an automobile or truck, by processing the signal received from the contents or parts using one or more techniques, including neural networks or other pattern recognition systems, and technologies including ultrasonic and electromagnetic radiation. The received signal may be a reflection of a transmitted signal, the reflection of some natural signal within the vehicle, or may be some signal emitted naturally by the object. Information obtained by the identification and monitoring system is then used to affect the operation of some other system in the vehicle such as the airbag, entertainment system, heating and air conditioning system, or the system to darken portions of the mirrors or windshield, among others. [A2971]

"Vibration detection"

The present invention describes a method and device to use radar to measure vibrations of a target object. The invention employs a radar system in which a signal equivalent to an echo from the object when it is not vibrating is subtracted from the actual returning echo signal before that echo signal is detected by the system's receiver so that the signal then actually received by the receiver consists only of that very much smaller component of the echo which is due to the displacements of the vibrating object from its rest position. This echo component is then amplified, and displacements of the object are determined from the amplified signal. The present invention utilizes long wavelength radar signals that can penetrate the ground to buried pipes and objects and permits detection of the effects of vibration on the reflected signals that are unmeasurable by known means. The present invention allows detection of vibrations of an object without making physical contact with it. Thus, measurement of vibrations, for example, of a water distribution pipe buried below ground may be detected. Such pipes vibrate (to produce a typical "hissing" sound) when they leak, and the present invention permits detection of leaks by sensing this vibration in the manner described herein. [A2972]

"Motor vehicle display system and ranging device"

A vehicle display system has a stationary detector and an indicator, which form a stationary vehicle detection apparatus being operative to produce an indicator signal which is indicative of the vehicle being stationary. The vehicle display system also has a vehicle deceleration detector and an indicator. The vehicle deceleration detector measures the magnitude of deceleration of a vehicle and generates a signal to drive the indicator and thereby generate a display indicative of the magnitude of vehicle deceleration. The vehicle deceleration detector is independent of the vehicle braking system. In one embodiment, the indicator is an array of lamps and the stationary vehicle indicator signal is an inanimate display. One embodiment has an additional ranging device that detects a trailing vehicle within a predetermined distance of the vehicle employing the ranging device. The ranging device may be used to initiate a change of the display generated by the vehicle display system. [A2973]

"Vehicle steering device"

A vehicle steering device has a steering inhibition portion that enables the steering device to be switched between a steering inhibition application mode and a steering inhibition release mode--regardless of whether or not the vehicle is being steered by a driver. This arrangement avoids the need to determine whether or not the vehicle is being steered before determining whether or not to inhibit steering. [A2974]

"Anticipatory collision sensor system"

An anticipatory object detection system includes a transducer device for transmitting a modulated carrier signal and receiving the reflected modulated carrier signal from an object, a detection device for detecting a plurality of Doppler shifted harmonic components from the reflected modulated carrier signal, a range determining device responsive to the amplitude of at least two of the harmonic components for determining the instantaneous range of the object, a velocity measurement device, responsive to the frequency of at least one of the harmonic components, for determining the relative, instantaneous velocity of the object. [A2975]

"Automatic vehicle seat adjuster"

An automatic seat adjustment system for a motor vehicle having a passenger compartment with a seat in which an occupant sits. The seat has power mechanisms for moving the seat relative to the passenger compartment from an initial position to an adjusted position, and control mechanisms connected to the power mechanisms for controlling the power mechanisms. Generally, the system includes measurement devices for measuring at least one morphological characteristic of the occupant and generating a first signal representative of the magnitude of that morphological characteristic, a processor including computational means for determining an adjusted seat position based on that measured morphological characteristic and which generates a second signal corresponding to the adjusted seat position, a first input device coupled to the measurement devices and to the processor for inputting the first signal into the processor, and a second input device coupled to the processor and the control mechanisms for inputting the second signal into the control mechanisms. In this manner, the control mechanism is able to affects the operation of the power mechanisms to move the seat to the adjusted position. [A2976]

"Modulating reflector circuit"

A modulating reflector circuit arrangement comprising a transistor configured by means of a feedback arrangement upon operation within a linear region of the transistor's current/voltage characteristic to reflect an incoming amplitude modulated signal with an increased amplitude and a modulator operable to modulate power to the transistor with a periodic waveform in which the reciprocal of the period of the periodic waveform is the required sideband frequency of the reflected signal and the waveform is selected such that the arrangement reflects a substantially single sideband signal. [A2977]

"Apparatus and method for detecting an underground structure"

An apparatus and method for locating an underground object or structure by employment of a radar-like probe and detection technique is disclosed. The underground structure is provided with a device which generates a specific signature signal in response to a probe signal transmitted from above the ground. Cooperative action between the probe signal transmitter at ground level and the signature signal generating device provided on the underground object provides for accurate detection of the subsurface object, despite the presence of a large background noise signal. The depth and, if desired, orientation of the underground object may also be determined using the signature signal generated by the signature signal generating device mounted to the underground object. Orientation information may be encoded on the signature signal or transmitted as an information signal separate from the signature signal. The probe signal may be microwave or acoustic. The signature signal produced by the signature signal generating device mounted to the underground object may be generated either passively or actively. Further, the signature signal may be produced in a manner which differs from the probe signal in one or more ways, including phase, frequency content, information content, or polarization. Also, the signature signal generating device may produce both location and orientation information, without the need for a separate orientation detecting device. Alternatively, orientation and location information may be produced by independent orientation detection and signature signal generating devices. [A2978]

"Modulated retroreflection system for secure communication and identification"

A modulated retroreflection system for secure two-way communication and identification includes a transceiver at a first location and a transponder at a second location. The transponder receiving, modulating, and reflecting the signal back to the transceiver includes a retroreflector having a at least one reflective surface coated with an electro-responsive material. The electro-responsive material modulating the reflection coefficient of the reflective surface thereby modulating signals reflected by the surface. The transponder further includes a modulator electrically connected to the electro-responsive material for applying a modulated bias voltage thereby modulating the refractive index and consequently the electrical phase, and/or amplitude of the reflected signal. [A2979]

"Interferometric moving vehicle imaging apparatus and method"

An interferometric moving target radar imaging system includes a plurality of simultaneously operating apertures, receivers and processing channels which together coherently process RF return signals to image a moving vehicle. The system corrects for the different phase centers of the apertures and interferometrically combines the return signals from different apertures to attenuate the energy from stationary objects. The true azimuth location of the moving vehicle within main beam clutter spread is then determined which facilitates distinguishing between slow moving and stationary objects to detect the moving objects which are then tracked and imaged in the range doppler domain. [A2980]

"Long range RF tag"

A long range identification system is disclosed for utilizing a radio frequency (RF) signal sent by a calling location, such as a mass transit vehicle, as the energy source to power response apparatus at a responding location, such as a route stop of the transit vehicle. The responding signal is then broadcast within the transit vehicle as audio or as a video display of a signal from a character generator, or as both audio and video. The long range identification system includes a RF transmitter at the calling location, a receiver at the responding location for receiving the signal and passively generating RF voltage in response to a particular RF signal of a predetermined frequency, a rectifier, capacitors connected to the rectifier to store charge, a voltage regulator connected to the capacitors and operating when a sufficient charge has developed in the capacitors, a digital code generator identifying the responding location, a transmitter for broadcasting a signal carrying the identifying code, and a receiver and decoder located at the calling location, or elsewhere. [A2981]

"Automotive anti-collision and alarm system"

An estimated travelling curve La (radius Rea) of a system vehicle is obtained based on a first group of sampling data (X1, Y1) through (X5, Y5) . Alarm area WA1a is set as a region surrounded by a pair of circular arcs parallel shifted from curve La by .+-.1 m and a pair of straight lines (Y=Y1 and Y=Y5) . Similarly, an estimated travelling curve Lb (radius Reb) is obtained based on a second group of sampling data (X3, Y3) through (X5, Y5) . Alarm area WA1b is set as a region surrounded by a pair of circular arcs parallel shifted from curve Lb by .+-.1 m and straight lines (Y=Y1 and Y=Y5) . At the entrance and exit of a curved road, values of radii Rea and Reb are differentiated. Hence, the collision judgement is performed by using different alarm areas WA1a and WA1b. [A2982]

"Modulation compensated clamp circuit"

A radio frequency identification (RFID) tag includes a tank circuit for receiving a power signal transmitted on a radio frequency (RF) carrier by a remote interrogator unit. Information is conveyed from the tag to the interrogator by varying a resistive load placed across the tank circuit as a function of data read from memory. Corresponding variations in the reflected signals are then detected by the interrogator. An overvoltage circuit cooperates with a modulation circuit for providing transmission of data even during an overvoltage condition, thus avoiding masking of the signal under such conditions. [A2983]

"Planar array antenna and phase-comparison monopulse radar system"

A planar array antenna comprises a plurality of antenna elements disposed in a predetermined matrix pattern. Feeders extend from a feed to the antenna elements. High-frequency switches cooperatively open or close the feeders connected to antenna elements of at least one row of the matrix pattern located at both a right-end and a left-end regions of an antenna surface. Switching signals are supplied to the high-frequency switches from switching terminals for alternately activating the associated antenna elements, thereby providing two time-divisional array antennas offset in position by a distance corresponding to the width of at least one row of the antenna elements controlled. [A2984]

"Combined speed measuring device detector, speed measuring device and printer for verifying vehicle speed"

The disclosed device enables the user to verify the speed of their vehicle responsive to sensing that a speed measuring device has been used to measure their speed. The device includes a speed measuring device detector designed to sense operation of a speed measuring device. When the detector senses such operation, it activates a speed measuring device mounted on the vehicle which instantaneously measures the vehicle speed and then stores the measured speed for later display and for printing a permanent record, if desired. [A2985]

"Transmission of frame-to-frame reversed polarity signals in a two-way cable TV conversion system"

A bidirectional cable television system provides for transmission of signals from cable subscribers downlink in the same direction as the ensemble of television channels which the cable television system is already constructed to deliver. The subscriber signals may be transmitted over the cable in the blanking intervals of a cable television channel, using the T-NET technique described in U.S. Pat. No. 4,750,036. Alternatively, the signals may be carried over a dedicated channel, or transmitted cochannel along a cable television channel carrying ordinary programming by adding the subscriber information to alternating video frames in alternating polarity to achieve visual cancellation. The subscriber signals are collected after the last distribution line amplifier in the cable downlink. The collected signals are transmitted to a central receiver via wireless or other customary means such as a modem. The collected signals may alternatively be transmitted over the air to the central receiver in the blanking intervals of a broadcast television channel using the T-NET technique. [A2986]

"Method and system for calculating a user account balance in a recognition system"

A system and method in which a transponder (14) is operable to transmit an original user account balance to an interrogator (12) , which in turn calculates a revised user account balance and transmits the revised user account balance to the transponder (14) . In one embodiment of the invention, the transponder (14) is further operable to transmit a verification user account balance back to the interrogator (12) , which then compares verification user account balance to the revised user account balance that was earlier calculated and stored in an interrogator memory. [A2987]

"Method for remotely determining sea surface roughness and wind speed at a water surface"

Transmitted signals are used to remotely assess sea surface roughness and nce wind speed at a water surface. A signal is transmitted from a signal source as it moves either through air or space. A land- or sea-based antenna receives the signal directly from the signal source and indirectly from the signal source by way of reflection of the signal from the surface being examined. The sum of the directly and indirectly received signals form an interference pattern as the signal source is moved. The interference pattern has peak-to-null signal values that are characteristic of the surface conditions being analyzed. Reference interference patterns are then generated for known surface conditions, each of the reference patterns exhibiting "known" characteristic peak-to-null signal values. The peak-to-null signal values of the reference interference patterns are then compared to the peak-to-null signal values generated from the surface being examined. The reference interference pattern having known peak-to-null signal values most closely resembling the peak-to-null signal values generated from the surface being examined is determined. The known surface conditions of this reference interference pattern are then equated with the unknown surface conditions of the surface being examined. By using this technique one can determine the surface conditions of a sea surface as well as the wind speed present at such a surface. [A2988]

"Object detecting process in vehicle"

In a vehicle including a distance sensor capable of detecting longitudinal and lateral distances from a subject vehicle to an object, the following steps are carried out: a step of enclosing some of the detection data, detected by the distance sensor, which exist within a first predetermined distance from one another, into a block having a block label assigned thereto, a step of comparing last and current values of the center of gravity position of each block with each other for every same block label to calculate a relative speed of each block relative to the subject vehicle, a step of determining object data by determining that some of the blocks, which exist within a second predetermined distance from one another and a difference between the relative speeds of which is within a preset value, are the same object, and a step of averaging lateral relative speeds of the blocks in the same object to determine a lateral relative speed of the object relative to the subject vehicle. In this manner, objects whose relative motions relative to the subject vehicle are different from one another are correctly detected, and lateral relative speed of the objects relative to the subject vehicle are accurately detected. [A2989]

"Method of and system for monitoring preceding vehicles"

A distance monitoring system of a vehicle monitors a distance to a preceding vehicle traveling directly ahead of the vehicle to determines whether the preceding vehicle is decelerating by comparing a change in the vehicle speed with a reference value which is varied according to various driving condition in relation in particular to dangers such as collisions against the preceding vehicle. [A2990]

"Apparatus for directing a mobile craft to a rendevous with another mobile craft"

Tracking means for establishing a line-of-sight between a control point towards which the second craft is being guided and tracking the line-of-sight to follow the second craft and deriving a signal .theta..sub.a representing the rate of rotation of the line-of-sight about the control point, monitoring means for deriving a signal e representing the displacement of the first craft from the line-of-sight, a signal representing the range R.sub.m from the control point to the first craft and a signal representing the rate of of change R.sub.m of the range R.sub.m , ranging means for deriving a signal representing the range R.sub.t from the control point to the second craft and a signal representing the rate of change R.sub.t of the range R.sub.t , a computer for deriving representations of .theta..sub.c, .theta..sub.c and .theta..sub.c which satisfy the equation where the difference .theta..sub.c -.theta..sub.a is minimised, control means for deriving from the representations provided by the computer a control signal representing f (e) +R.sub.m .theta..sub.c -2R.sub.m .theta..sub.c where f (e) is a function of e, and, guidance means for causing the first craft to develop an acceleration transverse to the line-of-sight, of a magnitude dependent on the control signal. [A2991]

"Method and apparatus for universal display of alphanumeric data on radar displays"

A radar system embeds information into the radar picture data for display on any display device. The radar receiver communicates weather data to a signal processor which generates a weather array. An I/O processor transmits data in the weather array to a display device via a picture bus. Alphanumeric data which is to be embedded into or combined with the weather array is stored in a message array. Font information for each alphanumeric character is stored in a font array. The message array and the font array are combined and translated into a text array which corresponds to the weather array. Prior to transmitting each radial of data to the display device, the I/O processor copies the appropriate radial data from the text array to the weather array thereby causing the desired alphanumeric characters to be displayed on the display device. [A2992]

"Electronic vehicle toll collection system and method"

A system for automatic collection of tolls includes an in-vehicle toll processor having memory for storing a toll-money-available quantity purchased by the user, and a toll-facility-identification site that transmits a toll-facility-identifier signal indicating the identity of the upcoming toll facility. As the vehicle approaches the identification site, the in-vehicle processor receives the identifier signal and calculates the toll to be debited. When the vehicle passes through the toll facility, the in-vehicle processor transmits its identity, its net balance and the toll, which it debits from an account balance. The in-vehicle processor may increment a low balance, in which case it transmits information which is relayed to a central system for billing. Various means for shutting down delinquent in-vehicle components or identifying offender vehicles are described. [A2993]

"Proximity sensor"

An improved capacitive sensor for detecting the presence of objects in a sensing region. The sensor is a multilayer structure with alternating layer of condutive and insulating materials. The sensor structure has three electrodes: a touch plate, a guard layer, a ground plane, each of which are separated from each other by insulating layers. The sensor is operated by detection electronic circuitry which function in a either a self excited mode or an externally excited mode. This sensor is capable of detecting objects in a sensing region several feet away from the sensing surface and is particularly suitable for automobile applications, such as detecting potentially jamming objects in power (auto-closing) windows, doors, and the like. [A2994]

"Method for locating moving objects"

The method of the invention is mixed and uses, in the forward link, the measurement of the phase of tones modulating a carrier and, in the backward link, a spectrum spread by pseudonoise code, which makes it possible to date the reception of the message. Application to the location of miscellaneous moving objects (land, sea, air, etc.) . [A2995]

"Obstacle recognition system for vehicle"

In an obstacle recognition system for a vehicle, transmission wave is irradiated per given angle for recognizing an obstacle ahead of the subject vehicle based on angle/distance data obtained from received reflected wave. A position of the obstacle is estimated based on a previously recognized position of the obstacle. The estimated position of the obstacle and an actually recognized position of the obstacle are compared so as to determine whether the obstacle currently recognized is identical with the obstacle previously recognized. Relative acceleration is derived for the obstacle which has been determined plural times to be identical with the previously recognized obstacle. When the derived relative acceleration is outside a given range, the corresponding obstacle is excluded from objects of further obstacle recognition. [A2996]

"Weather forecast apparatus and method based on recognition of echo patterns of radar images"

The present invention provides a weather forecast apparatus and a method for the same, to systematically classify a measured radar image based on results of pattern classification of past radar images so as to use the classified radar image. In the present invention, rapid forecasting is possible by making the FNN model previously learn based on data of each class (and indexes for forecast times) obtained by classification of past weather data for every resembling pattern. In addition, a calculation procedure for improving the classifying ability of patterns can be established by varying the procedure for calculating feature quantities with regard to the radar image by using the learning of the TNN model. Furthermore, systematic classification of a pre-learned image can be realized by performing self organization with regard to compound feature quantities extracted from a radar image in the PNN model, a typical example of which is a competitive learning model. [A2997]

"Method of determining the velocity of a radar target"

A method of determining the velocity of a radar target wherein at least two different pulse repetition frequencies are used. Each pulse repetition frequency comprises a predetermined division into equidistant Doppler numbers. for an echo signal, a Doppler number associated with the echo signal is determined for each pulse repetition frequency. Out of two Doppler numbers associated with different pulse repetition frequencies, a nonambiguous Doppler number is subsequently determined which lies within a predetermined velocity nonambiguity range, and the velocity of the radar target is determined from this Doppler number. [A2998]

"Post launch on-board identification friend or foe system"

A post launch identification friend or foe fire control system for a munition has an identification and ranging interrogation unit for mounting on a munition. The interrogation unit transmits an interrogation unit which detects and verifies an incoming identification code from a remote transponder unit in reply to the interrogation code. The range of the remote transponder is determined and a decision signal is provided to the fire control circuit of the munition to enable it to avoid a friendly target, a transponder unit receives the rf carrier signal containing an incoming interrogation code from an interrogation unit on board a munition, validates the incoming interrogation code, and extracts a timing signal from it. An identification code is synchronously generated with the incoming interrogation code using the timing signal. The synchronized identification code is then transmitted back to the interrogation unit on board the munition to confirm the identification of the transponder unit and its range. [A2999]

"Short range electromagnetic proximity detection"

A very low-cost, short-range electromagnetic transceiver uses a low frequency oscillator signal as a means of charging a step recovery diode (SRD) which converts the stored charge into a very short impulse to enable very high energy efficiency frequency multiplication. This impulse is coupled to an antenna which radiates the energy and receives reflections from objects in the vicinity. The energy of the received impulse reflections in an indicator of the distance of the object to the sensor. This system may be used in a vehicle to detect obstructions in its path of motion or a parking facility where it would determine the occupancy of each vehicle parking space. In the parking facility embodiment, information is reported to a central office computer which displays spaces which are not occupied and available for assignment. This system may also be used as a proximity detector for other applications, for example, to automatically detect pedestrians approaching a traffic control signal at a street corner or to detect the proximity of any object to another. [A3000]

"Method for determining the course of another vehicle"

A method for determining the course of another vehicle in relation to one's own vehicle by measuring the position of the other vehicle in relation to one's own vehicle with a transmitter/receiver system, such as a radar system permits course determination both on straight and on bend segments. According to the method, the side location of the other vehicle and one's own vehicle is determined at a position where the other vehicle is level with one's own vehicle, by moving the front vehicle backwards in time and/or moving the rear vehicle forwards in time, on the basis of position measurements of the position of the other vehicle. The side location of the other vehicle is compared with the side location of one's own vehicle, by which a measure of the discrepancy between the course of the other vehicle and the course of one's own vehicle is obtained. According to the invention, the position where the other vehicle is level with one's own vehicle may be determined on the basis of the inertial speed vector of the other vehicle at one or more points in time. [A3001]

"Vehicle blind spot detection display system"

A vehicle blind spot detection display system displays indications from a blind spot detector. The system includes a first indicator assembly positioned on the vehicle in the vicinity of an exterior mirror and adapted to producing an indication at least of the presence of an object adjacent the corresponding side of the vehicle. A second indicator assembly is provided on the vehicle interior mirror assembly and adapted to producing an indication at least of the presence of an object adjacent the same corresponding side of the vehicle. In this manner, redundant indications are provided at both the interior and exterior mirrors in order to assist the driver in a premaneuver evaluation of conditions surrounding the vehicle. [A3002]

"Fog piercing ranging apparatus and method"

An apparatus and method for accurately determining a target distance in adverse weather conditions utilizing both LASER and RADAR is disclosed. The radar signals are used to determine an approximate range which is then used as a gating window for the determination of which laser reflection is from the actual target as opposed to a reflection from the atmospheric interference. The method basically comprises the steps of initiating a radar pulse in the direction of a target and receiving a reflection, transmitting a laser signal and receiving a plurality of reflections, determining an approximate range based on the radar signals, and using this approximate range to ascertain which of the laser reflections is from the target. This determination is preferably made by generating a gating signal and gate width from the radar signals and passing the set of laser range signals through the gate to eliminate the false signals and select the signal that survives the gate as the accurate target range. [A3003]

"Automatic horizontal and vertical scanning radar with terrain display"

A weather radar and terrain map display system for aircraft with the terrain elevation and weather information displayed in an easy to read and comprehend presentation. The system includes an antenna for transmitting and receiving radar signals, a receiver for digitizing the reflected radar signals, and a computer for storing the signals and calculating the latitude and longitude coordinates of the locations from which the reflected radar signals were reflected, and for storing terrain elevation data. A display simultaneously shows a plan view image and vertical views of contoured terrain elevation data and the weather conditions found by the radar. The terrain and weather displays are superimposed over one another to enable quick and efficient location of critical terrain and weather conditions. The system can also calculate the latitude and longitude coordinates of the radar echoes without antenna stabilization. [A3004]

"Method of manufacturing an enclosed transceiver"

The present invention teaches a method of manufacturing a enclosed transceiver, such as a radio frequency identification ("RFID") tag. Structurally, in one embodiment, the tag comprises an integrated circuit (IC) chip, and an RF antenna mounted on a thin film substrate powered by a thin film battery. A variety of antenna geometries are compatible with the above tag construction. These include monopole antennas, dipole antennas, dual dipole antennas, a combination of dipole and loop antennas. Further, in another embodiment, the antennas are positioned either within the plane of the thin film battery or superjacent to the thin film battery. [A3005]

"Vehicle location system"

Method and apparatus for determining vehicle present location using a location determination system (LDS) , such as GPS, GLONASS, Loran or an inertial navigation system, that receives LDS signals from two or more sources. An LDS signal antenna and receiver/processor, an interrogation signal (IS) receiver means and IS responder means are electrically connected and carried on the vehicle. When a vehicle trigger event occurs, a specified vehicle IS is broadcast and is received by the IS receiver means. The IS receiver means causes the LDS receiver/processor to obtain vehicle present location information and to provide such information for the IS responder means, for transmission to an IS contact receiver (selected based upon vehicle present location) . The

IS receiver means and IS responder means are independently selected to be a cellular phone receiver, a paging signal receiver, a WAN/LAN workstation, or an Earth-satellite-Earth radiowave link, such as ORBCOMM.SM.. Optionally, the LDS receiver/processor is kept in a "sleeper" mode, to conserve power until the IS receiver receives and responds to the specified IS, or is periodically activated to update the LDS antenna present location. Presence of the LDS equipment, IS receiver means and/or IS responder means are concealed on the vehicle. In another embodiment, a trigger event sensor is positioned on the vehicle and the responder means is caused to transmit to the vehicle present location information when a vehicle trigger event occurs, such as unauthorized movement of or entry into the vehicle, or collision of the vehicle. [A3006]

"Radar switching system"

An improved switching system for controlling a radar control unit includes a radar hold switch and lock release switch on a remote control. Depression of the hold switch places the radar in a hold or standby mode. Upon depression and holding of the lock switch tracking of the target vehicle occurs. Upon release of the lock switch the displayed vehicle speed will be locked on the lock window of the radar with the radar unit being placed in a standby mode. A subsequent depression and release of the lock/release switch clears the locked target speed and maintains the unit in a standby mode. Underlying logic utilized by the signal processor analyzes signals corresponding to the positions of the hold and lock switches so as to direct the radar into the appropriate mode. [A3007]

"Method and assembly for object detection by a vehicle"

An object detection assembly and method use at least one sensor to detect a signal indicating the presence and location of an object relative to an automotive vehicle. A receiver receives a location signal created by a transmitter. A control unit receives the location signal and identifies the presence and degree of closeness of the object by activating audible and visual indicators. The control unit operates a parameter definer to identify the spatial parameters within which a warning of the existence of the object is to be activated. The control unit receives signals of vehicle speed and transmission state to determine the spatial parameters. [A3008]

"Vehicle longitudinal spacing controller"

A frontmost vehicle and a plurality of following vehicles are driven together in a line as a group. A virtual cell is set for each vehicle, allowing a predetermined distance in front of and behind the vehicle, and a virtual cell front end position of the frontmost vehicle is indicated from outside. A value obtained by adding the length of the virtual cell to the virtual cell front end position is transmitted to the following vehicle as the virtual cell front end position of the following vehicle. A relative position in the virtual cell of each vehicle is detected, and by controlling this relative position to a preset target position, the inter-vehicle distance is reduced and the generation of dilatational waves between the vehicles is prevented. [A3009]

"Method of manufacturing an enclosed transceiver"

The present invention teaches a method of manufacturing an enclosed transceiver, such as a radio frequency identification ("RFID") tag. Structurally, in one embodiment, the tag comprises an integrated circuit (IC) chip, and an RF antenna mounted on a thin film substrate powered by a thin film battery. A variety of antenna geometries are compatible with the above tag construction. These include monopole antennas, dipole antennas, dual dipole antennas, a combination of dipole and loop antennas. Further, in another embodiment, the antennas are positioned either within the plane of the thin film battery or superjacent to the thin film battery. [A3010]

"Managing assets with active electronic tags"

An object in a storage area or moving vehicle is monitored by attaching an electronic tag to the object. An electronic device detects the presence of the object by communicating with the tag while the object is in storage or is being moved by the vehicle. The tags may also determine the location of an attached object and may reroute the object if it deviates from a given shipping schedule. A group of objects is monitored by two electronic tags, each attached to an object in the group. Each tag has circuitry for communicating information relating to an object in the group to a second tag. Each tag also includes a memory connected to the circuitry that is capable of storing the information, and a controller connected to the memory and the circuitry. [A3011]

"Short range micro-power impulse radar with high resolution swept range gate with damped transmit and receive cavities"

A radar range finder and hidden object locator is based on ultra-wide band radar with a high resolution swept range gate. The device generates an equivalent time amplitude scan with atypical range of 4 inches to 20 feet, and an analog range resolution as limited by a jitter of on the order of 0.01 inches. A differential sampling receiver is employed to effectively eliminate ringing and other aberrations induced in the receiver by the near proximity of the transmit antenna, so a background subtraction is not needed, simplifying the circuitry while improving performance. Uses of the invention include a replacement of ultrasound devices for fluid level sensing, automotive radar, such as cruise control and parking assistance, hidden object location, such as stud and rebar finding. Also, this technology can be used when positioned over a highway lane to collect vehicle count and speed data for traffic control. Techniques are used to reduce clutter in the receive signal, such as decoupling the receive and transmit cavities by placing a space between them, using conductive or radiative damping elements on the cavities, and using terminating plates on the sides of the openings. [A3012]

"Arrangement for detecting objects in a region to be monitored"

A transmitter/receiver unit and a reflector unit are installed at opposite ends of a region to be monitored. The reflector unit consists of a receiving antenna whose signal is sent to a surface wave transit time element via a Wilkinson divider or a circulator. The signal returned from the latter is sent by the Wilkinson divider or the circulator to an amplifier that supplies a transmitting antenna, which in turn sends the signal back to the transmitter/receiver unit. Objects in the field of the beam cause a change in amplitude of the reflected signal, so the object can be detected with the help of an analyzer unit, namely an amplitude discriminator in the simplest case. The signals may be pulsed radar signals. It is advantageous, however, to use frequency-modulated signals corresponding to FMCW radar, so the frequency difference between the transmitted and reflected signal can also be used as a criterion for objects present in the monitored region in addition to using the amplitude of the reflected signal. The present invention can be used for monitoring railroad crossings. [A3013]

"Lightning locating system"

A lightning detection system for detecting and locating an initial discharge of an initial leader stroke of a lightning flash. An initial lightning discharge produces a pulse that can be used to accurately detect lightning, and more particularly, the location of the initial lightning discharge. In one embodiment, at least three sensors detect and determine the location of the first pulses from initial lightning discharges using time difference of arrival information of the pulses at each of the three sensors. In another embodiment, a single sensor is used to determine the range of an initial lightning discharge from the amplitude of a corresponding initial detected pulse, and to determine its direction from a crossed loop antenna. An alternative embodiment of a single sensor system determines a distance of a lightning event from a peak amplitude value derived from a pulse amplitude distribution. In a further embodiment, a lightning detection system provides enhanced lightning location by incorporating weather data from a weather radar with detected lightning information. [A3014]

"Auto-cruise system for vehicle"

In an auto-cruise system for a vehicle, when a distance detected by a distance detecting device becomes shorter than a reference distance based on a value detected by a vehicle speed detecting device, a speed reducing command signal is output from a distance regulating device. A travel speed control device is capable of being switched over among a cruise speed control mode for controlling the vehicle speed such that a vehicle speed is equalized to a vehicle speed set by a speed setting device upon non-outputting of a speed reducing command signal, a speed reducing control mode for reducing the vehicle speed upon outputting of the speed reducing command signal, and a speed increasing control mode for increasing the vehicle speed until it is restored to the set vehicle speed in response to the disappearing of the speed reducing command signal. In the speed increasing control mode of the travel speed control device, the acceleration until the restoration of the vehicle speed to the set vehicle speed is set such that it is lowered as the turning state detected by a turning state detecting device is enlarged. Thus, the restoration to the set vehicle speed after speed-reduction can be smoothed to ensure that a driver does not feel a discomfort or a sense of incompatibility. [A3015]

"Method and probe arrangement for the electromagnetic detection of metal objects"

The invention relates to a method and to a probe arrangement for the electromagnetic detection of metal objects. for this purpose several receiving loops are provided, which detect a secondary signal emitted by the sought object. The secondary signals received with the different loops are interconnected and evaluated in object-specific manner. This gives precise information on the position and location of the object to be detected. [A3016]

"Computerised radar process for measuring distances and relative speeds between a vehicle and obstacles located in front of it"

A vehicle radar emits four groups of single-frequency stepped radar pulses. In group A, the frequency of each pulse is a fixed amount higher than that of the preceding pulse. In group B, the frequency of each pulse is a fixed amount lower than that of the preceding pulse. In group C, the frequency of each pulse is the same as that of the preceding pulse. In group D, the frequency of each pulse depends on a modulo algorithm. The signals reflected from other vehicles may readily be processed with inexpensive equipment to discriminate among such other vehicles, and to determine the distance to, and relative speed of, each such vehicle. [A3017]

"traffic surveillance process and device"

A traffic surveillance system measures a speed of a vehicle within a traffic scene, optically records the traffic scene, and reproduces the traffic scene on a display in synchronism with a display of the measured speed. The system includes a speed sensor which measures the speed of the vehicle within the traffic scene and an electro-optical camera having a recording medium in which video signals representing the traffic scene are stored. The camera is equipped with an audio input and output connected to a soundtrack of the recording medium. The audio input receives modulated signals of the measured speed for storage in the soundtrack in synchronism with the video signals. The measured speed signals and the video signals are combined in a video mixer and reproduced on the display. [A3018]

"Compact vehicle based rear and side obstacle detection system including multiple antennae"

A rear and side object detection system for a vehicle based on monolithic millimeter wave integrated circuit technology. A multiple antenna configuration is employed that defines six sensing regions to the right, left and the rear of the vehicle. A sixth sensing region is defined at the right side of the vehicle, a second sensing region is defined at the right side and rear of the vehicle and overlaps the sixth sensing region, a fourth sensing region and a first sensing region extend from the rear on both sides of the vehicle in the adjacent lanes, a third sensing region is defined at the left side of the vehicle and a fifth sensing region is defined at the left side and rear of the vehicle and overlaps the second and third sensing regions. A right side warning signal is issued if an object is detected in a right side detection zone defined by the sixth sensing region or a portion of the second sensing region that does not overlap the fourth or fifth sensing regions. Likewise, a left side warning signal is issued if an object is detected in a left side detection zone defined by the third region and a portion of the fifth sensing region that does not overlap the second or first sensing regions. A back-up warning signal is issued if an object is detected in an overlap region between the second and fifth sensing regions. [A3019]

"Geophysical prospecting apparatus utilizing pulsed electromagnetic signals and having a scanned four-cycle transmitter"

Apparatus for use in a geophysical prospecting method from a vehicle for site plan pictorial representation of inclusions present in substratum soil which reflect modulated electromagnetic oscillations. This apparatus is particularly useful for detecting inclusions such as veins of water, ore beds, pipelines, unexploded bombs, cavities, ammunition and residual fissures. A transmitter and receiver are mounted in the vehicle with a common quartz oscillator in a sawtooth generator. A transmitting antenna and receiving antenna are provided with an amplifier connected to the latter. A pulse shaper employs the width of received triangular pulses from the amplifier to give needle pulses and a color transmitter has four power amplifiers and is a goniometrically scanned four-cycle transmitter, and accordingly the cathode ray tube has four crosswise arranged horizontal sweep coils in addition to the frame coil. The frequency of the frame sweep and scanning signals is 50 Hz and these signals are stabilized using a synchronizing signal obtained from the quartz crystal/oscillator circuit. The crystal frequency typically is 50 kH and the synchronization signals are obtained by a frequency divider network having a ratio of 1000: 1. [A3020]

"Phase difference measuring apparatus and method using a first and second receive signal"

A phase difference measuring apparatus obtains a first receive signal by transmitting and receiving a to-be-measured material in a reference state and a second receive signal by transmitting and receiving a signal wave to and from that material in a measured state. The apparatus finds a reference phase difference .theta..sub.1 from the transmit wave and first receive signal and an apparent phase difference .theta..sub.2 ' from the transmit wave and second receive signal. The apparatus adds the apparent phase difference .theta..sub.2 ' to a product of the number of rotations, n, the apparent phase difference .theta..sub.2 ' passes through a given reference point and an angle of 360.degree. to find a true phase difference .theta..sub.2. The apparatus varies the number of rotations, n, to n+1 when the apparent phase difference .theta..sub.2 ', while being increased, passes through the reference point and that number of rotations, n, to n=n-1 when the apparent phase difference .theta..sub.2 ', while being decreased, passes through the reference point. [A3021]

"Body monitoring and imaging apparatus and method"

A non-acoustic pulse-echo radar monitor is employed in the repetitive mode, whereby a large number of reflected pulses are averaged to produce a voltage that modulates an audio oscillator to produce a tone that corresponds to the heart motion. The antenna used in this monitor generally comprises two flat copper foils, thus permitting the antenna to be housed in a substantially flat housing. The monitor converts the detected voltage to an audible signal with both amplitude modulation and Doppler effect. It further uses a dual time constant to reduce the effect of gross sensor-to-surface movement. The monitor detects the movement of one or more internal body parts, such as the heart, lungs, arteries, and vocal chords, and includes a pulse generator for simultaneously inputting a sequence of pulses to a transmit path and a grating path. The pulses transmitted along the transmit path drive Oh impulse, generator and provide corresponding transmit pulses that are applied to a transmit antenna. The gating path includes a range delay generator which generates timed gating pulses. The timed gating pulses cause the receive path to selectively conduct pulses reflected from the body parts and received by a receive antenna. The monitor output potential can be separated into a cardiac output indicative of the physical movement of the heart, and a pulmonary output indicative of the physical movement of the lung. The impulse generator in the transmit path can be replaced with a pulsed RF generator. [A3022]

"Micropower impulse radar based wheel detector"

A wheel detector for indicating the presence of a rail vehicle on a set of spaced rails is disclosed. The wheel detector transmits a radar pulse signal and samples a portion of the signal corresponding to a target area on one of the rails. The wheel detector will generate an indication signal if a change in the reflectivity of the received signal corresponding to the target area is detected. The wheel detector may additionally include multiple transmitters and receivers to provide redundancy, and be configured to determine the linear velocity and direction of a wheel. [A3023]

"Sensing apparatus using frequency changes"

An apparatus and method for determining various physical quantities such as temperature, pressure, stress, strain, distance and the like in a manner such that a change in the physical quantity of interest results in a measurable change in the frequency of oscillation of a signal generated within the apparatus. [A3024]

"Power steering device"

A power steering device uses a control value set in accordance with a vehicle's detected steering torque to control an actuator, which generates steering assistance power. When the vehicle appears to be on a collision course with an obstacle detected in its steering direction, the control value is modified so as to inhibit the steering. The control value after the modification for the steering inhibition is a function of the control value prior to the modification. When the detected value of the steering torque is greater than the preset value, the function is modified such that the degree of steering inhibition is increased by comparison with a situation in which the detected torque is less than the preset value. [A3025]

"Method and apparatus for cruise control"

A cruise control system arranged to determine whether the closest targeted vehicle ahead of a vehicle being controlled is running in its lane or an adjacent lane and if it is determined that the closest vehicle is running in an adjacent slower lane, allowing the controlled vehicle to overtake the closest vehicle if the way ahead is clear, and if it is determined that the closest vehicle is running in an adjacent faster lane, selecting that closest vehicle as a prime target to control the acceleration of the controlled vehicle unless there is another vehicle running in the same lane as the controlled vehicle which requires deceleration of the controlled vehicle, in which case the vehicle running in the same lane is selected as the prime target. [A3026]

"Apparatus for avoiding crosstalk problems when locating a vehicle travelling along means for propagating electromagnetic waves"

An apparatus for avoiding crosstalk problems when locating a vehicle travelling along an electromagnetic wave propagation path. The apparatus is particularly directed to rail transport. The apparatus includes a transmitter for transmitting electromagnetic waves suitable for propagation along the propagation path. A reflector is included for reflecting the electromagnetic waves which propagate along the propagation path. The apparatus also includes a receiver, a comparator, and a processor. The apparatus is configured so that the transmitter does not transmit electromagnetic waves along the propagation path at the same time that the receiver receives the reflected electromagnetic waves. Because the transmitted waves are not transmitted on the propagation path at the same time as the reflected waves are received, the receiver receives only reflected waves at a time when there is no crosstalk interference between the transmitted and reflected waves. The vehicle's location is determined by comparing the transmitted and reflected waves. [A3027]

"Sensors and methods for sensing displacement using radar"

A sensor for sensing a displacement in a mechanical system using radar utilizes a miniaturized radar transceiver formed, typically, on a silicon chip. The transceiver is mounted to a fixed surface that senses a displacement of a moving surface. The moving surface is typically located in mechanical communication with a system to be sensed. By using appropriate translating circuitry, an accurate determination of the nature of displacement of the mechanical system can be made. Mechanical systems sensed can include rotating and sliding components such as motors, valves and pressure gauges. Sensors according to this invention are highly accurate and reliable. [A3028]

"Signaling means"

A device and method to avoid collisions is described. The device and method is primarily directed to preventing tail-gating by motorists and the avoidance of otherwise resultant collisions. The method and device may also be utilized to detect stationary objects and to alert the driver of a vehicle of an imminent collision. [A3029]

"Autonomous navigation system for a mobile robot or manipulator"

In an autonomous navigation system for a mobile robot or a manipulator which is intended to guide the robot through the workspace to a predetermined target point in spite of incomplete information without colliding with known or unknown obstacles. All operations are performed on the local navigation level in the robot coordinate system. In the course of this, occupied and unoccupied areas of the workspace are appropriately marked and detected obstacles are covered by safety zones. An intermediate target point is defined in an unoccupied area of the workspace and a virtual harmonic potential field is calculated, whose gradient is followed by the robot. Mobile robots with such an autonomous navigation system can be used as automated transport, cleaning and service systems. [A3030]

"Short range, ultra-wideband radar with high resolution swept range gate"

A radar range finder and hidden object locator is based on ultra-wide band radar with a high resolution swept range gate. The device generates an equivalent time amplitude scan with a typical range of 4 inches to 20 feet, and an analog range resolution as limited by a jitter of on the order of 0.01 inches. A differential sampling receiver is employed to effectively eliminate ringing and other aberrations induced in the receiver by the near proximity of the transmit antenna, so a background subtraction is not needed, simplifying the circuitry while improving performance. Uses of the invention include a replacement of ultrasound devices for fluid level sensing, automotive radar, such as cruise control and parking assistance, hidden object location, such as stud and rebar finding. Also, this technology can be used when positioned over a highway lane to collect vehicle count and speed data for traffic control. [A3031]

"Hybrid ultrasonic and radar based backup aid"

A backup aid system, for a vehicle, senses when the vehicle is in reverse gear. Ultrasonic sensors at the rear of the vehicle provide continuous range information to a control module for objects that are detected as being relatively close to the vehicle. A radar system provides range information to the control module for objects detected beyond the range of the ultrasonic system. At low speeds below a predetermined minimum speed level or when the system is placed in the "park" mode for parking, the radar information is ignored and only the ultrasonic information is used to warn the vehicle operator. At a relatively high threshold backup speed, the vehicle operator is immediately warned to slow down, whether or not an object is detected in the vehicle path. Between the lower and upper threshold speeds, both the ultrasonic system and the radar system are used to continuously range and detect any objects that enter their respective detection fields. The control module causes an alarm device to warn the driver as to how close the vehicle is to the closest object. [A3032]

"Obstacle warning system for a vehicle"

An obstacle warning system for a vehicle includes a distance measuring device for emitting a transmission wave or laser light in a given angular range in a direction of a width of the vehicle in a scanning manner, and for detecting a distance between the vehicle and an obstacle in correspondence with a scan angle on the basis of a reflected wave or reflected light from the obstacle. A relative position calculating device calculates a relative position of the obstacle with respect to the vehicle on the basis of the distance detected by the distance measuring device and a corresponding scan angle. A radius calculating device calculates a radius of an estimated relative curved path of the vehicle with respect to the obstacle on the basis of relative positions of at least two points of the obstacle which are calculated by the relative position calculating device. A warning area setting device sets a given warning area on the basis of the width of the vehicle and the radius calculated by the radius calculating device. A warning device executes a given warning process if the obstacle remains in the warning area for a given period of time. [A3033]

"Method and apparatus for controller power train of motor vehicle"

The vehicle power train control method and apparatus according to the invention secures both operability and safety by controlling an actual acceleration/deceleration to a target acceleration/deceleration requested by a driver under safe traveling condition, and changing the target acceleration/deceleration so as to take precedence for safe traveling if the driver encounters a dangerous traveling condition. According to the invention, acceleration/deceleration and speed of a motor vehicle are detected, a target acceleration/deceleration is determined, and a road condition such as a road gradient or presence or absence of a forward motor vehicle is detected to decide whether the road condition is dangerous. The target acceleration is changed if the condition is decided to be dangerous. [A3034]

"Electronic parking and dispatching management method and apparatus"

Method and apparatus for the automatic management of vehicle access to a restricted access area. The system includes at least one base transceiver positioned at least at one location providing an entrance to and an exit from said restricted access area. The system also includes a plurality of vehicle borne transponders, and an independent management computer. As vehicles attempt to access the restricted area, the base transceiver, the vehicle transponders, and the independent management computer communicate to monitor and regulate the vehicle access. According to one embodiment, the invention automatically manages access to a commercial parking facility. In another embodiment, the invention automatically dispatches taxicabs from a corral area. In a further embodiment, the invention controls vehicle access to facilities such as gated communities, and employee and student parking areas. [A3035]

"Method and apparatus for measuring the speed of a moving body"

To measure the speed of a body (1) moving relative to the ground (2) by means of a broad-band Doppler radar (3) fixed to the moving body, two incident radar waves are transmitted successively towards the ground at instants that are close together, and the corresponding reflected waves are picked up, the frequency of at least the first incident wave being time-varying, the signals representative of the first incident and reflected waves are multiplied together, a spectrum is determined for the low frequency component of the product of said two signals, the same operations are performed for second incident and reflected waves, then two peaks that correspond with a certain amount of frequency shift in the two spectra are identified, and the speed of the moving body is determined as a function of the frequencies of these two singular points and as a function of the height of the radar relative to the ground. [A3036]

"FMCW radar system for detecting distance, relative velocity and azimuth of a target obstacle"

Beat signals of respective receiver channels CH1 and CH2, produced by mixing their receiving signals with a transmission signal, are subjected to Fourier transformation to detect the frequency and phase of peak frequency components in both an ascending-section where the frequency of the transmission increases and a descending-section where the frequency of the transmission decreases. Based on peak frequency components derived from the same target, phase differences .DELTA..phi.u (i) and .DELTA..phi.d (j) between receiver channels CH1 and CH2 in the ascending- and descending-sections (steps 210-230) . Relative relationship between the transmission signal and the receiving signal is judged based on the signs of the phase differences. Respective peak frequencies fu (i) and fd (j) , detected as absolute values of frequency differences between the transmission signal and the receiving signal, are given sings in accordance with the judgement result. Then, the distance D and relative velocity V of the target are calculated (steps 240-260) . [A3037]

"Obstacle warning system for a vehicle"

As provided here, an obstacle warning system for a vehicle is capable of issuing an alarm accurately according to the curved state of a road. When the road is curved, the system sets the correction time counter on the basis of the following conditions: whether or not the curvature radius of the curved road is small, whether or not a guardrail is detected immediately ahead of the vehicle, whether or not an erroneously-recognized object, such as a set of guardrail reflectors exhibiting large relative acceleration is immediately ahead of the vehicle, and whether or not the number of obstacles recognized reaches a value indicating that the vehicle is approaching a curved section of the road. When a stationary object enters the field of view indicating that there is a possibility of a collision, the obstacle warning system corrects the warning distance in response to the value of the correction time counter, thus making it possible to avoid a false alarm during cornering. [A3038]

"Apparatus and method for cruise control"

An AICC cruise control system which operates in accordance with a driver's headway request given in terms of a desired time interval between the controlled vehicle and the preceding (target) vehicle, wherein, upon slowing of the target vehicle towards zero velocity, the calculated station of the controlled vehicle behind the target is changed from being a pure time-based interval into a time interval which is calculated to include a proportion of a desired residual range at standstill, the proportion being dependent upon the velocity of the controlled vehicle. [A3039]

"Spread spectrum localizers"

A network of localizers determines relative locations in three-dimensional space to within 1 cm by cooperatively measuring propagation times of pseudorandom sequences of electromagnetic impulses. Ranging transmissions may include encoded digital information to increase accuracy. The propagation time is determined from a correlator circuit which provides an analog pseudo-autocorrelation function sampled at discrete time bins. The correlator has a number of integrators, each integrator providing a signal proportional to the time integral of the product of the expected pulse sequence delayed by one of the discrete time bins, and the non-delayed received antenna signal. With the impulses organized as doublets the sampled correlator output can vary considerably in shape depending on where the autocorrelation function peak falls in relation to the nearest bin. Using pattern recognition the time of arrival of the received signal can be determined to within a time much smaller than the separation between bins. Because operation of standard CMOS circuitry generates noise over a large frequency range, only low-noise circuitry operates during transmission and reception. To provide the time accuracy necessary for distancing, a high-frequency clock operates during inter-localizer communications. The high-frequency clock uses a phase-lock loop circuit to increase the clock rate and a programmable delay to provide still finer time graduations. A stage in the low-frequency clock uses low-noise circuitry during transmissions and receptions, and standard circuitry at other times. [A3040]

"Vehicle collision control system"

A vehicle collision control system has a distance measuring sensor, a collision predictive device for outputting a collision predictive signal, a deceleration calculating device for calculating a first limit deceleration allowing the vehicle to run while braking without losing its stability and a second limit deceleration for making the collision speed lower than a survival space ensuring speed, an arithmetic processing device for outputting a braking start signal upon comparing the aforementioned limit decelerations which change according to the running of the vehicle after the collision predictive signal is outputted, a braking command device for commanding a predetermined braking force to a braking device upon receiving the braking start signal, an impact sensor for sensing, and a collision signal generating device for outputting a collision occurrence signal to the logic circuit when the impact sensor senses the collision, so that an ignition signal is outputted to the inflator of the air bag device according to a logical product between the collision predictive signal and collision occurrence signal. [A3041]

"Automatic vehicle seat adjuster"

An automatic seat adjustment system for a motor vehicle having a passenger compartment with a seat in which an occupant sits. The seat has power mechanisms for moving the seat relative to the passenger compartment from an initial position to an adjusted position, and control mechanisms connected to the power mechanisms for controlling the power mechanisms. Generally, the system includes measurement devices for measuring at least one morphological characteristic of the occupant and generating a first signal representative of the magnitude of that morphological characteristic, a processor including computational means for determining an adjusted seat position based on that measured morphological characteristic and which generates a second signal corresponding to the adjusted seat position, a first input device coupled to the measurement devices and to the processor for inputting the first signal into the processor, and a second input device coupled to the processor and the control mechanisms for inputting the second signal into the control mechanisms. In this manner, the control mechanism is able to affects the operation of the power mechanisms to move the seat to the adjusted position. [A3042]

"Radar device with reduced power emission"

A radar device secured to a vehicle includes a transmitter for broadcasting continuously frequency-modulated radar signals over a time range. The time range is fixed as a function of a speed of the vehicle and is longer at a higher speed and shorter at a lower speed. A receiver receives the radar signals. An evaluation circuit compares the transmitted and received radar signals to ascertain information about the surroundings and in particular a distance from and a relative speed with respect to an object. [A3043]

"Radar transponder"

A radar transponder for a stable and reliable response transmission upon reception of a weak radar signal having a reflection-conscious circuitry free from damage by a transmit effect, including a reception damage by the leakage of a powerful transmit wave signal and a transmission damage by the reflection of the powerful transmit wave signal. The reflection-conscious circuitry may include a circulator coupled to the transmit/receive antenna for selecting the powerful transmit wave signal or the weak radar signal, a receiving circuit provided after the circulator for receiving the weak radar signal, and an SPDT switch provided between the circulator and the receiving circuit for passing an input of the weak radar signal to the receiving circuit in a receiving period with its ground function dormant and for leading an input of the powerful transmit wave signal to a ground using the ground function in a transmitting period. The SPDT switch includes a reflectionless terminator at the entry of the input signal, a diode having a ground end at the outlet of the input signal, a quarter-wave line between the entry and the outlet and a drive signal input for driving the ground function. [A3044]

"Synchronous identification of friendly targets"

A synchronous communication targeting system for use in battle. The present invention includes a transceiver having a stabilizing oscillator, a synchronous amplifier and an omnidirectional receiver, all in electrical communication with each other. A remotely located beacon is attached to a blackbody radiation source and has an amplitude modulator in electrical communication with a optical source. The beacon's amplitude modulator is set so that the optical source transmits radiation frequency at approximately the same or lower amplitude than that of the blackbody radiation source to which the beacon is attached. The receiver from the transceiver is adapted to receive frequencies approximately at or below blackbody radiation signals and sends such signals to the synchronous amplifier. The synchronous amplifier then rectifies and amplifies those signals which correspond to the predetermined frequency to therefore identify whether the blackbody radiation source is friendly or not. [A3045]

"Device security system"

An object tracking, communication, and management system for a laptop computer or similar device, wherein a beacon or transceiver in the computer implements file integrity or device recovery steps. The beacon protects data, or transmits files or data from computer storage back to the owner or authorized party, either automatically or in response to a request for data recovery, and may broadcast a signal for tracking and recovery of the computer after a theft. Preferably the system also operates in a normal mode to provide or acquire files or data, to or from a remote location, as either requested by the operator or by a third, calling or transmitting party, or automatically, for normal communications or data upkeep. When activated as a security device it implements strategic machine control including enabling, disabling, or modifying functions of the computer and communication of data. The system includes a beacon with preferably both a transmitter and a receiver, internal security logic, and external system elements for locating the beacon via either RF tracking or the communication of its position coordinates back to the owner via the transmitter. A combination of hardware and/or software within the beacon and the host system initiates and coordinates operation of the aforementioned communications or security features. Tamper detection logic implemented in software or hardware responds to tampering or removal of the beacon or other components by alerting via the transmitter and/or disabling functionality of the host. Preferably low level codes operate at the bios level to assure effective operation even when higher level software or plug-in components have been overridden or removed. [A3046]

"Traveling-path prediction apparatus and method for vehicles"

A vehicle traveling-path prediction apparatus that detects a stationary object in front of the vehicle by utilizing an obstacle detection device instead of a yaw rate sensor, and predicts a traveling path based on the detected stationary object. The apparatus comprises control unit having an obstacle detection device which receives a detection signal from a radar head unit to detect an obstacle in front of the vehicle, stationary object detection device which receives an output signal from the obstacle detection device to detect the obstacle as a stationary object, a first traveling-path prediction device which receives an output signal from the stationary object detection device, and if there is a stationary object in front of the vehicle, calculates a radius of curvature R1 of a first traveling path, based on data indicative of running conditions of the vehicle, a second traveling-path prediction device which calculates a radius of curvature R2 of a second traveling path, based on a velocity V0 and a steering angle .theta.H, and a selection device which receives a detection signal from the radar head unit and if there is no stationary object in front of the vehicle, selects the second traveling path R2 calculated by the second traveling-path prediction device. [A3047]

"Method and apparatus for coherent burst ranging"

A high resolution ranging method is described utilizing a novel modulated waveform, hereafter referred to as coherent burst modulation. In the coherent burst method, high frequency modulation of an acoustic or electromagnetic transmitter, such as a laser, is performed at a modulation frequency. This modulation frequency is transmitted quasi-continuously in the form of interrupted bursts of radiation. Energy from the transmitter is directed onto a target, interacts with the target, and the returning energy is collected. The encoded burst pattern contained in the collected return signal is detected coherently by a receiver that is tuned so as to be principally sensitive to the modulation frequency. The receiver signal is processed to determine target range using both time-of-flight of the burst envelope and phase shift of the high frequency modulation. This approach effectively decouples the maximum unambiguous range and range resolution relationship of earlier methods, thereby allowing high precision ranging to be conducted at arbitrarily long distances using at least one burst of encoded energy. The use of a receiver tuned to the high frequency modulation contained within the coherent burst vastly improves both sensitivity in the detection of the target return signal and rejection of background interferences, such as ambient acoustic or electromagnetic noise. Simultaneous transmission at several energies (or wavelengths) is possible by encoding each energy with a separate modulation frequency or pattern, electronic demodulation at the receiver allows the return pattern for each energy to be monitored independently. Radial velocity of a target can also be determined by monitoring change in phase shift of the return signal as a function of time. [A3048]

"Method and apparatus for precise noncoherent doppler tracking of a spacecraft"

A method and apparatus are disclosed for making precise velocity measurements of a spacecraft using a two-way noncoherent Doppler tracking system. By comparing the received uplink and transmitted downlink frequencies on-board the spacecraft, information is generated that is included in the downlink signal and used to cancel spacecraft oscillator drift rate effects in the two-way Doppler measurement made by the ground station. This data can also be used to characterize the drift rate of the spacecraft oscillator, thus permitting periods of accurate one-way Doppler tracking by the ground station. [A3049]

"Method and apparatus for precisely locating a resonant object"

The method and apparatus precisely identifies and locates an object which resonates in response to signals of at least one and, more typically, two resonant frequencies. The locating apparatus includes a transmitter for concurrently transmitting signals having a resonant frequency and signals having a non-resonant frequency toward the resonant object. The locating apparatus also includes at least two receivers for receiving reflected signals having the resonant frequency and the non-resonant frequency. The locating apparatus further includes a signal processor for locating the resonant object based upon the reflected signals detected by the receivers. The signal processor has multiple channels, one of which is associated with each receiver, for separately processing the reflected signals received over time by each of the receivers. Within each channel, the signal processor significantly reduces signal clutter based upon respective differences between the reflected signals having the resonant frequency and the reflected signals having the non-resonant frequency which were received by the respective receiver. By reducing signal clutter in the received signals, the locating apparatus identifies and locates the resonant object with more precision. [A3050]

"Vehicle accurately detect an object in a lane of the radar equipped vehicle moving in a curve"

A scan-type radar apparatus for a vehicle which determines with a high level of accuracy whether an object detected by the radar exists in the lane in which the radar equipped vehicle is moving while the radar equipped vehicle is moving in a curve. A scan-type radar detects objects existing in a detectable range. A center direction is assumed which indicates a center of each of the objects detected by the scan-type radar with respect to the vehicle based on a distance between the vehicle and each of the objects and a turning radius of the vehicle. A vehicle moving lane area is set within the detectable range. The vehicle moving lane area, which corresponds to a vehicle moving lane in which the vehicle is moving, extends on either side of the center direction with a predetermined angle range. An extent of the vehicle moving lane area is corrected so that an inner area of the vehicle moving lane area is increased when the vehicle is moving along a curve, the inner area being a portion of the vehicle moving lane area located on an inner side of the curve with respect to the center direction. [A3051]

"Fast maximum likelihood processor for means wind velocity estimation"

A real time maximum likelihood estimator (MLE) processor employs a table look-up mechanism to eliminate the MLE computation complexity. The real time MLE processor can be implemented with digital signal processing (DSP) chips in a personal computer. Optimally accurate estimates of mean wind velocity are obtained at all signals and noise ratios (SNR) using fast software algorithms. [A3052]

"Method for position determination"

Method which involves determining the position of a number of measured objects by determining a number of directions to the measured objects from at least two measuring stations, of which at least one is mobile, the method being used to decide which of the points of intersection between the directions correspond to measured objects and which ones do not correspond to measured objects. Changes in the mutual movements between the measuring stations and the points of intersection are in this case determined by comparison between the paths in which the points of intersection and the measuring stations are moving. The points of intersection whose movement is not affected by changes in the movement of other points of intersection, or by changes in the movement of at least one measuring station, correspond to positions of measured objects. [A3053]

"On-board unit for transponder operation"

An on-board unit includes at least one receiving and transmitting antenna for a bidirectional transmission of data which works in accordance with the transponder method. To compensate for interference fading, a high-frequency amplifier is connected in an incoming circuit to the demodulator/modulator, through which the transmission range of the transmission distance is improved as well. The same amplifier and the demodulator/modulator can be used in downlink and uplink operation. In uplink operation, the demodulator/modulator can alternatively subject the carrier signal to amplitude shift keying or phase shift keying. [A3054]

"Radar system and method of operating same"

A proximity fuze radar system is described including a transmitter for transmitting a signal modulated by a pseudo-random noise code signal and a receiver for receiving signals including the modulated signal reflected by an object or target. The proximity fuze radar system further includes delay circuitry for delaying in time the pseudo-random noise code signal for providing a delayed noise code signal and circuitry for correlating a near range portion of the received signals with the delayed noise code signal and for providing base band signals. The proximity fuze radar system still further includes suppression circuitry for correlating a longer range portion of the received signals with the delayed noise code signal and for providing a rejection signal for summing the base band signals with the rejection signal to reduce the signal level of undesired signals. With such an arrangement, a radar system is provided having less susceptibility to undesired signals. [A3055]

"Method of an apparatus for detecting the displacement of a target"

A method of detecting the displacement of a target in a given environment includes storing reference data having data representative of the environment, transmitting a transmit signal towards the target, sensing the return signals from the target and the environment, and detecting the displacement of the target by comparing the return signals and the stored reference data. A method of detecting the level of a sample in a container is also disclosed. Analogous apparatus features are also disclosed. [A3056]

"Radar apparatus for detecting a direction of a center of a target"

A radar apparatus of an automotive vehicle includes a radar unit which radiates an electromagnetic wave to a target in a forward direction of the vehicle and receives reflection beams from the target to detect the target. A scanning control unit performs a beam scanning of the radar unit to the target so that the reflection beams during the beam scanning are received. A center direction determining unit detects a distribution pattern of the received reflection beams with respect to respective scanning angles of the radar unit, performs a similarity approximation of the distribution pattern by using an antenna directional gain pattern of the radar unit to produce an approximated distribution pattern, and determines a direction of a center of the target based on a peak of the approximated distribution pattern. [A3057]

"Collision avoidance system"

A system for preventing collisions between a vehicle and other objects, the vehicle having a blind side, an opposite driver side, a from end and an opposite rear end, has side ranging capability that determines the distance from the blind side of the vehicle to an object in a lane immediately adjacent to the blind side while the vehicle is in the process of moving into a traffic lane immediately adjacent to the blind side. Rear ranging capabilities are employed to determine the distance from the rear side to an object behind the vehicle while the vehicle is in the process of backing up. A calculating capability, responsive to the side ranging capability and the rear ranging capability, determines when an object is in a lane immediately adjacent to the blind side while the vehicle is in the process of moving into the lane immediately adjacent to the blind side and also determines when an object is behind the vehicle while the vehicle is in the process of backing up. An indicating capability, responsive to the calculating means, indicates that an object is in the lane immediately adjacent to the blind side while the while the vehicle is in the process of moving into the lane immediately adjacent to the blind side and indicates that an object is behind the vehicle while the vehicle is in the process of backing up. [A3058]

"Proactive exterior airbag system and its deployment method for a motor vehicle"

A proactive vehicle safety device, a proactive exterior airbag system, is disclosed, which consists of a detection subsystem, a control subsystem and a deployment subsystem. The design of each of the subsystems is provided. The detection method, control method and deployment method of the proactive exterior airbag system are also provided. Two types of exterior airbags are disclosed. [A3059]

"Detection range adjusting system of obstacle detection apparatus for vehicle"

A detection range adjusting system of an obstacle detection apparatus for a vehicle having a transmitting-receiving unit mounted on the vehicle for transmitting a detection signal directed over a predetermined range and receiving a reflection signal of the detection signal is provided. This system comprises a detection range setting means for processing the reflection signal and setting a detection range for detecting an obstacle which is included within the predetermined range and narrower than the predetermined range, a standard reflecting body positioned at a predetermined position relative to the vehicle, a standard position storing means for storing a standard position of the standard reflection body in the detection range beforehand, and an adjustment instructing means for instructing transmission of a detection signal for adjustment of the detection range. Setting of the detection range setting means is changed so that a detected position of the standard reflecting body in the detection range detected based on a reflection signal of the detection signal transmitted according to the instruction of the adjustment instructing means coincides with the standard position stored in the standard position storing means. [A3060]

"FM-CW radar apparatus for measuring relative speed of and distance to an object"

An FM-CW radar which is suitable for automotive anti-collision systems, for example, is provided. This radar outputs a radar signal in the form of a triangular wave whose frequency is increased at a given rate and decreased at a given rate. A receiver receives a wave reflected from a target to produce a beat signal and takes the Fourier transform of the beat signal to determine peak frequency components thereof showing peaks in a frequency spectrum. The receiver also determines phases of the peak frequency components and selects at least one from the peak frequency components in a frequency-rising range wherein the frequency of the radar signal is increased and at least one from the peak frequency components in a frequency-falling range wherein the frequency of the radar signal is decreased which show substantially the same phase to pair them for determining the distance to and relative speed of the target based on the frequency of the paired peak frequency components. [A3061]

"Interference canceling receiver"

A receiver used in a system having a transmitter (10) that sends an exciting signal to a remote transponder (18) is configured to receive a relatively weak signal from the transponder and to cancel out relatively high level interference from the transmission itself. A received frequency shift keying signal is fed to a tuned amplifier (22) for preliminary analog signal conditioning, and thence fed to an analog to digital converter (24) . The output of the analog to digital converter is integrated (26) over a selected number of clock pulses and then dumped into a quarter rate quadrature demodulator (60) that multiplies the integrated signal by the same signal delayed by one clock interval. Undesired artifacts generated in the demodulator (60) are removed by a cascade of comb filters (70) , and the demodulated digital output is available as the desired output of the receiver. The several clock signals of the system are all referenced from a basic exciter signal that itself gives rise to the transmitted interference signal so that the interference and all timing signals are approximately synchronous. [A3062]

"Detection of multiple articles"

An identification system comprises an interrogator and a plurality of transponders. The interrogator includes a transmitter which transmits at least two independent interrogation signals to the transponders, and a receiver for receiving response signals from the transponders. The interrogator also includes processor means for identifying the transponders from data in the received response signals. Each transponder comprises receiving means, a code generator, and transmitter means connected to the code generator. On receipt of at least one of the transmitted interrogation signals the transponder transmits a response signal containing data which identifies it. The interrogation signals may be transmitted continuously or intermittently. In a preferred embodiment, the interrogation signals are relatively narrow bandwidth signals at different frequencies. The receiving means of each transponder has a relatively broad reception bandwidth so that the transponder is responsive to one or more of the interrogation signals. [A3063]

"Trenchless underground boring system with boring tool location"

An apparatus and method for locating an underground boring tool using a radar-like probe and detection technique. A boring tool is provided with a device which generates a specific signature signal in response to a probe signal transmitted from above the ground. Cooperative operation between the probe signal transmitter at ground level and a signature signal generator disposed within the boring tool provides for the accurate locating of the boring tool, despite the presence of a large background signal. The signature signal produced by the boring tool may be generated either passively or actively, and in a manner which differs from the probe signal in one or more ways, including timing, frequency content, or polarization. A survey of a boring site, made either prior to or during the boring operation, provides data related to the characteristics of the ground medium subjected to the survey and the identification of underground hazards, such as buried utilities. Knowledge of ground characteristics enables estimates of boring productivity and cost to be made. Accurate surveys of planned boring pathways can be made and compared, either contemporaneously or subsequently, against the accurately measured position of the boring tool during a boring operation. The direction of the boring tool may be adjusted in response to the measured position in order to maintain the boring tool along the planned pathway and at an optimum boring rate. [A3064]

"Radar device for vehicle use"

A radar device for vehicle use which can be manufactured inexpensively while enhancing its monitoring function for an adjacent object as well as a remote object. The radar device includes a radar module for monitoring an adjacent object having a plurality of adjacent object monitoring antennas, a signal transmitting/receiving section for supplying transmitting signals to the adjacent object monitoring antennas and outputting signals by mixing the transmitting signals with received signals supplied from the adjacent monitoring antennas and a delay circuit inserted between the signal transmitting/receiving section and the adjacent object monitoring antennas. The radar device also includes a module for monitoring a remote object having a remote object monitoring antenna and a signal transmitting/receiving section for supplying transmitting signals to the remote object monitoring antenna and generating signals by mixing the transmitting signals with received signals supplied from the remote monitoring antenna. The radar device has a monitoring control section for controlling the operations of both the radar module for monitoring an adjacent object and the radar module for monitoring a remote object and the monitoring control section receives the signals output from the radar modules and detects the range to the object which generates reflected signals based on the beat signals. [A3065]

"Doppler-radar based automatic vehicle-classification system"

A method for automatically categorizing the general variety of motor-vehicle types moving through a given checkpoint, according to their predominant characteristics, basically involving features such as length, height, axle count, existence of a trailer, and specific envelop contour (i.e.--motorcycle, car, truck, bus, limousine, etc.) . Advantageously employing Doppler-based CW-radar for ultimate real-time accuracy, resolving even closely spaced vehicles having differing acceleration/deceleration rates, the system will establish a vehicle's classification during stop-and-go or at speed. Real-time velocity information is read from successively radar targeted vehicles, while combined with real-time information acquired via at least one special electronic profiling-window apparatus employing beam emitters/receptors or lasers in making incremental transverse-slice readings of traversing vehicles. Readings are assembled by data-processor into a longitudinal dot-matrix pattern, and compared to pre-established vehicle profiles, for segregation into particular vehicle-classification types for toll-charge auditing. [A3066]

"Vehicle collision avoidance system"

A collision avoidance system for a vehicle has a vehicle steering sensor for sensing a direction in which the vehicle is being steered, a source of radiation, an articulated reflector for directing radiation from the source in a desired direction, an articulation mechanism for effecting articulation of the articulate reflector, and a close loop control circuit responsive to the vehicle steering sensor for controlling the articulation mechanism so as to cause the articulated reflector to direct radiation in a direction which is generally the same as that direction in which the vehicle is turning. [A3067]

"Method of improving zone of coverage response of automotive radar"

Side detection radar utilized on a host vehicle for covering a blind spot in a vehicle mirror view produces alert commands resulting in signals which have gaps due to poor radar reflectivity of portions of a target. To fill these gaps to produce a steady alert signal when a target vehicle is in radar view and to extend the perceived zone of coverage, a variable sustain time is added to each alert signal which exceeds a threshold value. The sustain time varies as an inverse function of the relative vehicle speed and the threshold value varies as an inverse function of vehicle speed. If the alert signal is shorter than the threshold value, then a minimized hold time can be applied. [A3068]

"Microstrip antenna"

An microstrip antenna for use in a vehicle collision system is described wherein an array of rectangular patch elements are arranged in rows and columns on a substrate. A feed structure is used whereby a high gain highly efficient flat plate antenna is produced. The feed structure includes a pair of main lines to which feed points are connected. A plurality of branch lines connect at right angles to the main lines and extend alongside columns of patch elements. The patch elements are so spaced that they are electrically separated by a whole multiple of the dielectric wavelength. The main lines are connected to the branch lines by coupling traces whose widths are selected to establish a desired power distribution. A plurality of strip transformers are distributed along the main lines and connected to junctions with the branch lines to reduce reflections. [A3069]

"Radar module for radar system on motor vehicle"

A FM radar alarm system for use on a motor vehicle detects a following motor vehicle in an adjacent lane behind the motor vehicle. The FM radar alarm system includes an FM radar module including a near-region monitoring antenna and a far-region monitoring antenna. The near-region monitoring antenna radiates a relatively wide radio-wave beam in a near region positioned behind the motor vehicle and extending over an adjacent lane. The far-region monitoring antenna radiates a relatively narrow radio-wave beam in a far region positioned behind the motor vehicle and extending over the adjacent lane. [A3070]

"Digitally programmable radio modules for transponder systems"

A programmable digital radio is configured to perform transponder functions. A receiver in the programmable digital radio receives analog signals from an interrogator and digitizes the analog signals to produce digital interrogation signals. The digital interrogation signals are processed digitally and valid interrogations are detected. Processing includes detection of pulses, determination of each pulse's threshold, determination of intervals between pulses and whether the intervals meet mode criteria, and determination of priority of output of digital messages encoded in the pulses. At least one message is supplied to a transmit module in the programmable radio. The transmit module performs diversity processing on the received message to determine to which received signal to reply, produces reply data and modulates the reply data to produce intermediate frequency signals. The intermediate frequency signals are then converted to analog signals which are transmitted to the interrogator. [A3071]

"Method and apparatus for adjusting steering feel"

A vehicle steering apparatus (20) includes a steering feel motor (50) . A torque sensor (58) senses steering torque applied by a vehicle driver. A sensor (24) senses a characteristic of a driver and provides a signal indicative thereof. A hazard sensor (44) senses a potential steering hazard. The steering feel motor is controlled in response to the sensed driver characteristic and to any sensed potential steering hazard. Either open-loop or closed-loop control is provided for controlling the feel motor in response to sensed static and dynamic forces. [A3072]

"Excavator data acquisition and control system and process"

A data acquisition system for acquiring geological information from a subsurface includes a geologic imaging system that is used to survey the subsurface of a site or route. A geologic characterization unit may also be employed to enhance the geologic imaging data obtained by the geologic imaging system. The acquired data are processed to provide detailed geologic information for the subsurface. In one embodiment, a memory stores geologic filter data including geologic profile data for numerous types of known geology. A processor, cooperating with the memory and data acquisition unit, uses the geologic filter data to remove content from the acquired geologic imaging data corresponding to known geology, thereby providing for immediate recognition of unknown and suspect subsurface characteristics. In another embodiment, the memory stores excavation difficulty data associated with known types of geology. The processor associates a reflected electromagnetic signal received by the geologic imaging system with the excavation difficulty data to produce estimated excavation difficulty data for the subsurface. The geologic imaging system may include a ground penetrating radar system having a plurality of antennas oriented in an orthogonal relationship to provide three-dimensional imaging of a subsurface. [A3073]

"Broadband CDMA overlay system and method"

A spread-spectrum CDMA communications system for communicating data between a plurality of users to a plurality of spread-spectrum units. The spread-spectrum communications system is located within a same geographical region as occupied by an existing FDMA, proposed TDMA or any other mobile-cellular system. The spread-spectrum CDMA communications system includes a plurality of spread-spectrum-base stations and a plurality of spread-spectrum units. A spread-spectrum-base station has a comb filter for notch filtering predetermined channels of the mobile-cellular system, a device for converting the format of the data into a form for communicating over radio waves, a spread-spectrum modulator for spread-spectrum processing the data, and a transmitter for transmitting the spread-spectrum-processed converted data from the spread-spectrum-base station to a spread-spectrum unit. The spread-spectrum-base station also has an antenna, and spread-spectrum detectors for recovering data communicated from the spread-spectrum units. A spread-spectrum unit has an antenna, and a detector, including a spread-spectrum demodulator, coupled to the antenna for recovering data communicated from the spread-spectrum-base station, and the spread-spectrum unit has a spread-spectrum modulator, a transmitter, and a device for converting the format of the data for communicating over radio waves. [A3074]

"Traffic information system"

Disclosed is a traffic information system high in the ability to collect information. An on-vehicle apparatus is carried on a vehicle, to collect traffic information such as traffic jam information, accident information and weather information. The on-vehicle apparatus comprises a car navigation system, where position information is sensed, and information relating to a traffic jam, an accident and weather are manually entered or are automatically sensed. The on-vehicle apparatus further comprises a laser radar, where the number of vehicles, the speeds of vehicles, and the shapes of vehicles are sensed, and traffic jam information and accident information are created based thereon. Various information collected by the vehicle are transmitted to a center via a repeater. Information processed by the center are transmitted to vehicles again. [A3075]

"Vehicle collision preventing system"

In a vehicle collision preventing system, a possibility of collision of a subject vehicle against an object ahead of the subject vehicle is determined at least based on values measured by a distance measuring unit for measuring longitudinal and lateral distances between the subject vehicle and the object and a value detected by a subject-vehicle speed detecting device, an actuator is operated in accordance with the result of such determination to avoid the collision. A lateral relative distance of the subject vehicle and the object is calculated by a lateral relative distance calculating device based on the values measured in the distance measuring unit. Any of a judge level in the judgment of the collision possibility in a judging device or operation levels of actuators is changed in accordance with the result of the determination in a collision avoidance level determining device based on the lateral relative distance. Thus, the actuators are operated in accordance with a variation in lateral relative distance between the subject vehicle and the object, so that the collision preventing operations of the actuators are more easily accepted by a driver. [A3076]

"Navigational system and method"

A navigational system for determining the relative position of two objects, which comprises projector means for projecting an information field to be at least partially incident on both said objects, receiver means associated with at least one of said objects for detecting the information field incident on said two objects, and means responsive to the receiver means to determine the relative position of said objects. [A3077]

"System and method for determining absolute vehicle height and ground speed"

A system and method for determining absolute vehicle height and ground speed. As disclosed, a millimeter wave radar system for determining selected boundary distances is implemented based upon a generation of a modulated millimeter wave signal which is envelope detected and thereafter phase detected to determine the selected boundary distance on a continuous real-time basis. To similarly determine absolute vehicle speed on a continuous real-time basis, a method is disclosed for use in cooperation with an on-board microcomputer, the height sensing system described above, and a passive speed sensor aperture which is affixed to the chassis and directed toward the ground at some angle theta. In operation, a portion of the RF signal radiated by the height sensor is backscattered toward the passive speed sensor aperture. The Doppler Shift of this signal caused by vehicle motion is determined. Information derived from the height sensor subsystem is then used to correct errors in vehicle speed computation due to vertical chassis motion and road surface aberrations. [A3078]

"Resonant tag and method of manufacturing the same"

A resonant tag has one electrode plate of a capacitor and an electric circuit, which is electrically connected to the capacitor, formed on one surface of the insulating film composing the resonant circuit. On the other surface of the insulating film, the other electrode plate of the capacitor, which is electrically connected to the electric circuit, is formed. Heat pressing is performed on the insulating film existing between the two electrode plates with a predetermined pressure and at a predetermined temperature to shorten a distance between these electrode plates, and a crystal structure of the insulating film is destroyed to form a penetrating hole which penetrates through both the electrode plates. [A3079]

"Cruise controller for vehicles"

A vehicle which can execute both vehicle-speed based auto-cruising control and vehicle-interval distance based auto-cruising control has a single operation knob having a SET switch, a RESUME switch, and a COAST switch. In order to allow the single operation knob to set both a target vehicle speed and a target vehicle-interval distance, when the SET switch is operated during the vehicle-speed based auto-cruising control, a vehicle speed at the time of the operation or at the end of the switch operation is set to be the target vehicle speed, when the SET switch is operated during vehicle-interval distance based auto-cruising control, a vehicle-interval distance at the time of the operation or at the end of the switch operation is set to be the target vehicle-interval distance. [A3080]

"Vehicle-mounted radar system and detection method"

Modulation frequency setting device sets the modulation frequency on the basis of the vehicle speed data from a vehicle speed detector and the detected range data, causing a low frequency oscillator to generate a low frequency signal of the set frequency. A transmitter transmits an electromagnetic wave (e.g., infrared light) which have been modulated with the low frequency signal. A phase comparator detects the phase difference between the low frequency signal and a detector output, and a range operating device produces range data. Relative speed operating unit finds the relative speed based on the range data. In case of a high vehicle speed, the modulation frequency is set low to extend the detection range. If an object in a short distance is detected, the modulation frequency is set high to limit the detection range to a short range, thereby enhancing the range resolution. [A3081]

"Police traffic radar using FFT processing to find fastest target"

A police radar utilizing digital data transmission from the antenna unit to a separately housed counting and display unit. The antenna has a double balanced mixer to suppress even order harmonics. The counting and display unit has a computer programmed to perform digital signal processing on the digital data received from the antenna to improve the quality and accuracy of calculated speeds for patrol speed, strongest target speed and fastest target speed. Fastest target speed can be displayed simultaneously with strongest target speed. Signal processing techniques are used to suppress false signals caused by double and triple bounce, harmonics, intermodulation products, video display terminal interference, etc. [A3082]

"Vehicle location unit"

A Vehicle Location Unit (VLU) device includes in functional relationship an RF receiver, a transmitter, a receive/transmit switch, a microcontroller to control the receiving/transmitting path, a digital Large Scale Integration (LSI) , having a digital signal processing device, a crystal oscillator, and a filtering device for an outcoming signal. [A3083]

"Statistical quality control of wind profiler data"

The quality of wind profiling radar data is evaluated by comparing the probability density function of the power density of sets of returned samples to an exponential function. The standard deviation of individual samples from the exponential function can be evaluated to identify possible sources of contamination of the wind profiler data. [A3084]

"Converter for cruise control system"

A converter for use with a constant speed vehicle cruise control system including a speedometer for generating a self speed signal representative of the self speed of the vehicle and a speed adjustment control responsively coupled to the speedometer for maintaining the self speed of the vehicle at a preset speed. The converter adapts the control system to a constant distance system, and comprises a rangefinder for generating a distance signal corresponding to the distance of the vehicle from a front vehicle, and a distance-dependent speed adjustment device coupled to the rangefinder and to the speedometer for generating a synthetic-speed signal corresponding to the set speed required for maintaining a predetermined distance between the two vehicles. A selector switch allows either the self speed or synthetic-speed signals to be connected to the speedometer of the cruise control system. [A3085]

"Obstacle detecting system for vehicles"

An obstacle detection system for vehicles detects kinetic attributes relative to a vehicle equipped with the system of an object present in a forward path of travel of the vehicle, sets a presumed zone into which the object is expected to have entered at a lapse of a specified period based on the kinetic attributes, and proves an object detected at a lapse of the specified period as the object previously detected if the object of second detection is determined as one having moved into the presumed zone and an obstacle precarious to the vehicle. [A3086]

"Transponder maintenance mode method"

A method and system is provided for communicating permanent or semi-permanent information to a transponder (14) from an interrogator (12) , preferably operated by a toll agency or other authorized entity. This permanent or semi-permanent information is communicated by means of special instructions valid only during a special mode or maintenance mode which is entered by transmitting a special access code to the transponder (14) from the authorized interrogator (12) . The transponder (14) will preferably acknowledge to the authorized interrogator (12) that it is, in fact, operating in the maintenance mode so the interrogator (12) can transmit the special instructions in confidence. [A3087]

"Method and apparatus for constructing an environment map of a self-propelled, mobile unit"

An improved method and apparatus for constructing a cellularly structured environment map of a self-propelled, mobile unit is provided. Examples of such self-propelled, mobile units are household robots, self-propelled vacuum cleaners and industrial transport vehicles. To this end, a higher increment for the occupancy degree of a currently evaluated cell is selected for near objects. Further, the occupancy degree is also incremented dependent on a velocity. As an additional measure given standstill of the unit, all cells of the environment map that are located within the aperture cone of a wavefront that emanates from the sensor of the mobile unit are modified in terms of their occupancy degree values. Additionally, a blind zone in which grid cells of the environment map experience no modification of the occupancy degree is defined around the mobile unit. [A3088]

"Highway vehicle guidance system"

A radar highway motor vehicle guidance apparatus for guiding a land vehicle along a roadway using a forward looking, lateral position sensing, monopulse tracking radar guidance apparatus which transmits radar pulses forward of the vehicle. The pulses are reflected back to the vehicle by a stripe distributed along the roadway. The stripe is a frequency selective surface which generates retro-reflective grating lobes at an operating frequency of the tracking radar. Operating the radar at two frequencies allows the radar to look at regions spaced at two different distances from the front of the vehicle. Highway related information may be encoded in the frequency selective surface by variations in the shape or dimensions of the frequency selective stripe morphology in order to modulate the reflected signal with highway information which is then also detected at the radar receiver. Target discrimination is enhanced by using pseudo random codes and matching antenna polarization with stripe polarization. [A3089]

"Position-finding apparatus for locating a vehicle travelling along means for propagating electromagnetic waves"

The present invention relates to apparatus for locating a vehicle V travelling along propagation means P. An object of the apparatus of the invention is to determine the position of the vehicle V, i.e. to determine the distance D between the vehicle V and a given point along the propagation means P. Application in particular to rail transport. [A3090]

"Collision avoidance detector"

A collision avoidance detector including a transceiver installed in a rear portion of a leading vehicle operative to transmit a signal to and receive a reflected signal from a trailing vehicle, a processor operative to process the signals and derive therefrom information concerning a safe distance criterion between the leading and trailing vehicles and an alarm device, wherein the processor actuates the alarm device if the safe distance criterion is not met. [A3091]

"Measuring apparatus for detecting distance between vehicles and related warning system"

A measuring apparatus for measuring an actual distance between vehicles and comparing the measured distance with a reference distance. The reference distance (SL) is obtained on the basis of: a personal space (VR.multidot.TIMEK) being an uneasy distance peculiar to a driver and obtained in accordance with the own vehicle speed, a free running distance (VRR.multidot.TIMEN) corresponding to a response time of a driver's braking operation and a relative speed between two vehicles, a braking distance (VRR.sup.2 / (2.multidot.GR)) corresponding to a depressing strength of a braking pedal in the driver's braking operation and the relative speed, and an acceleration change distance (.alpha.G.multidot.GA) corresponding to a relative acceleration between the two vehicles, using the following equation: where VR represents the own vehicle speed, TIMEK represents an uneasy factor, VRR represents the relative speed, TIMEN represents a response factor of the driver's braking operation, GR represents a braking deceleration factor, .alpha.G represents a preceding vehicle acceleration, and GA represents a preceding vehicle deceleration factor. [A3092]

"Method for localization of beacons for an autonomous device"

The present invention provides an improved method for determining a coarse direction in an orientation system of a an autonomous device (10) , for instance a dust cleaning robot together with a system of active beacons or transponders. A transmitter (20) for transmitting sensing signals is displaced in relation to the rotational center (25) of the the device (10) . When the device is rotated around a vertical rotational axis in the rotational center, a minimum in the distance to the respective transponder or beacon is obtained when the transmitter of the device is positioned immediate to a point lying on a straight line between the rotational center of the device and a respective transponder, whereby an immediate coarse determination of the direction to each transponder is directly obtained. From such an immediate direction determination direct better starting values are obtained for a position calculation by means of for example Kalman filtering, by which successively from the signals obtained by these transponder responses an orientation basis is achieved for the area where the device should be acting. [A3093]

"Pulse homodyne field disturbance sensor"

A field disturbance sensor operates with relatively low power, provides an adjustable operating range, is not hypersensitive at close range, allows co-location of multiple sensors, and is inexpensive to manufacture. The sensor includes a transmitter that transmits a sequence of transmitted bursts of electromagnetic energy. The transmitter frequency is modulated at an intermediate frequency. The sequence of bursts has a burst repetition rate, and each burst has a burst width and comprises a number of cycles at a transmitter frequency. The sensor includes a receiver which receives electromagnetic energy at the transmitter frequency, and includes a mixer which mixes a transmitted burst with reflections of the same transmitted burst to produce an intermediate frequency signal. Circuitry, responsive to the intermediate frequency signal indicates disturbances in the sensor field. Because the mixer mixes the transmitted burst with reflections of the transmitted burst, the burst width defines the sensor range. The burst repetition rate is randomly or pseudo-randomly modulated so that bursts in the sequence of bursts have a phase which varies. A second range-defining mode transmits two radio frequency bursts, where the time spacing between the bursts defines the maximum range divided by two. [A3094]

"Electromagnetic detection system for parking operation"

A system which provides an alarm indicative of a presence of an obstacle in a vicinity of a vehicle. The system operates by electromagnetic detection, and generates an oscillating radiofrequency signal. A transmitter transmits the generated oscillated radiofrequency signal to create, all around the transmitter, an electromagnetic radiofrequency near field. A receiver receives the electromagnetic radiofrequency near field. A detector is connected to the receiver and detects a perturbation resulting in a reduction of an oscillation amplitude of the electromagnetic radiofrequency near field, and an indicator indicates the detected perturbation of the received electromagnetic radiofrequency near field. Based on this operation, an obstacle in a vicinity of the vehicle can be detected. [A3095]

"Vehicle signal apparatus"

Apparatus provides a signal to an operator of a following vehicle when it is necessary to take appropriate action to avoid coming within a predetermined distance of a lead vehicle proceeding in the same direction. From initial predicted forward velocities and distances of the lead and following vehicles, the signal apparatus (1) derives subsequent predicted velocities and positions of the lead and following vehicles and a subsequent predicted distance D (t) between the lead vehicle and the following vehicle after a projected short time interval while assuming a predetermined braking action of the following vehicle (2) , derives and compares the subsequent predicted distance D (t) between the lead vehicle and the following vehicle with a least distance D.sub.LEAST, and (3) sets the least distance D.sub.LEAST equal to the subsequent predicted distance D (t) between the lead vehicle and the following vehicle if the latter is smaller. The signal apparatus iteratively applies the calculating means, beginning with forward velocities and positions derived from sensor signals as the initial predicted forward velocities and distances in the first iteration and generates a signal if and when the least distance becomes smaller than a minimum allowable distance D.sub.MIN. [A3096]

"Collision judging system for vehicle"

A collision judging system for a vehicle includes a sensor for detecting a relative speed between a subject vehicle and an object, and a judging section for judging a possibility of collision of the subject vehicle with the object based on the relative speed. In the collision judging system, when an output from the differentiating device exceeds a preset value, a signal indicative of a command to prohibit the judgment of the possibility of collision in the judging section is outputted from the prohibiting-signal outputting device, thereby avoiding the unnecessary judgment of the possibility of collision in the judging section. [A3097]

"Vehicle run safety apparatus"

When information of an obstacle is not outputted from a radar device, a presumption device presumes at least a present value of a distance between a vehicle and the obstacle based on information in a memory part obtained until the time, and a contact-possibility judgment device judges a possibility of contact of the vehicle with the obstacle based on the information from the presumption device. A detection device is provided for detecting conditions at the time when the information of the obstacle is not outputted from the radar device, for example, a relation of relative position of the obstacle to the vehicle. Further, a restriction device is provided for restricting the presumption by the presumption device according to the relation of relative position. Thus, a possibility of contact of the vehicle with the obstacle running forward of the vehicle is appropriately judged and mis-operations of an alarm, an automatic braking and the like are prevented, while ensuring running safety. [A3098]

"Mine detecting device having a housing containing metal detector coils and an antenna"

A device detects metallic and non-metallic objects on, flush with, or covered by the ground or other surfaces, or by interfering or obscuring structures or surfaces, using ground penetrating radar, a metal detector and a radiometer. It is specifically designed for detection of non-metallic mines. The coils of the metal detector are mounted in a multi-sensor module with the radar antenna in a co-boresighted and/or co-located arrangement, without degrading the performance of the metal detector or the ground penetrating radar. Preferably, the ground penetrating radar uses a feed and a collimation lens, (such as a Luneberg or Step Dielectric lens) , as an antenna to reduce the change in the loss of signal strength due to changes in distance between the surface and the antenna, (for short distances) . The collimated beam has approximately constant power for distances closer than twice the diameter of the lens. By using the lens with a ground penetrating radar, the antenna can be held somewhat farther from the ground, as well as eliminating "clutter" introduced as the antenna moves closer and farther from the ground. The sensor for the radiometer is co-located in the multi-sensor module. The sensors selected for the multi-sensor module employ different detection phenomena. Therefore, each sensor has its unique source for false alarms. The sensors' independent phenomenologies provide a synergism, which when processed, achieve an increase in probability of detection concurrent with a reduction in the false alarm rate for mines. [A3099]

"Method for producing a cellularly structured environment map of a self-propelled, mobile unit that orients itself in the environment at least with the assistance of sensors based on wave refection"

The method produces an improved cellularly structured environment map of a self-propelled mobile unit which orients itself using sensors based on wave reflection. In detail, the following measures are implemented. First, an error of discrete representation in the positional determination of the self-propelled mobile unit is avoided in that the position of the self-propelled mobile unit within an originating cell of the coordinate system of the environment map is also used for identifying the location of obstacles. Further, a smaller cell size is employed in the proximity of the self-propelled mobile unit in order to facilitate maneuvering between obstacles located close to one another. Further, two separate grid maps are maintained, one containing the unit with a rotational orientation and the other being rotated by a rotational angle relative to the global environment map for a fast occupation of a plurality of cells with values. Examples of such self-propelled mobile units are household robots, self-propelled vacuums and industrial transport vehicles. [A3100]

"Radar apparatus for detecting a distance/velocity"

A radar apparatus for detecting a distance/velocity has a transmitting system for transmitting a signal which is frequency-modulated with a modulating signal having a predetermined recurrence frequency, a receiving system for receiving a reflected wave signal, which is the modulated transmission signal transmitted from the transmitting system and reflected by an object, and which mixes the reflected wave signal and the modulated transmission signal from the transmitting system so as to detect a beat wave signal of the reflected wave signal and the modulated transmission signal. The apparatus also includes a high-pass filter for filtering the beat wave signal detected in the receiving system so as to cut off modulation frequency components of the modulated transmission signal with orders that are equal to or lower than a predetermined order, and a distance/velocity calculating unit which calculates the distance to and the relative velocity with respect to the object based on frequency information in the beat wave signal which has been passed through the high-pass filter. Accordingly, the radar apparatus effectively removes FM/AM conversion (reconversion) noise in a simple structure thereby to accurately detect the distance to and the relative velocity with respect to the object even with low transmitting power. [A3101]

"Inter-vehicle distance measuring apparatus and method for automotive"

An inter-vehicle distance measuring apparatus is composed of an inter-vehicle data measuring and transmitting unit for measuring and transmitting inter-vehicle distance data related to the distance between a vehicle in front and a host vehicle, a communications unit installed by a road for receiving the inter-vehicle distance data transmitted from the inter-vehicle data measuring and transmitting unit, an inter-vehicle distance measuring unit for measuring the distance between the vehicle in front and the host vehicle, a correction amount determining unit for calculating a correction amount for correcting the distance between the vehicle in front and the host vehicle measured by the measuring unit based on the inter-vehicle distance data received by the communications unit, and a correcting unit for correcting the distance between the vehicle in front and the host vehicle measured by the inter-vehicle distance measuring unit based on the correction amount. [A3102]

"Durable, lightweight, radar lens antenna"

A radar lens 14 is made from a conventional Fresnel lens 10, but replaces the conventional curved surface 32 with a stepped approximation thereto 22, 24, 26, preferably of three steps. The thickness of the stepped lens 14, at each step, is a half-wavelength or a multiple half-wavelength of the radar operating frequency in the medium of the lens 14. The half-wavelength or multiple half-wavelength separation of the steps 22, 24, 26 causes reflections from the front 16 and rear 18 surfaces to cancel, thereby minimizing the (undesirable) standing wave between the lens 14 and the feed horn or feed horns 46, 48, 50. This avoids the necessity of reducing the standing wave by presenting the curved or stepped side 18 forward. The planar side 16 of the lens 14 (unlike the stepped side 18) doesn't need to be protected from road debris. The lens 14 can therefore be molded as an integral unit of a radome, desirable in the automotive setting. This lens 14 is also thin enough (and, therefore, light enough) that it can be moved side-to-side very rapidly, preferably by a combination of cams 42, 52 and springs 44, 54. This allows a very fast scan, albeit over a limited field of view. Gimballing 56 the lens 14 and feed horns 46, 48, 50 together provides a slower scan, but gives an unlimited field of regard. Combining the two gives a fast scan and unlimited field of regard, desirable in the missile setting. [A3103]

"Police radar jammer"

A method to confuse a police radar by moving a multiplicity of radar reflector antennas in the field of view of the radar. The moving radar reflector antennas present continuously changing doppler velocities to the police radar. The radar reflectors can be any of several reflective antennas such as dipoles, Yagies, horns, etc. The continuously changing doppler velocities are generated by mounting the radar reflector antennas on a moving disk. The moving disk is driven by an electric motor or by the wind. The radar reflector antennas can also be mounted on the rim or in the tread of a vehicle's tires. [A3104]

"Apparatus for automatic refueling of vehicles"

Apparatus for the automatic fuelling of vehicles. A robot head that carries a fuel filler tube is movable to enable it to be brought into position to engage with a vehicle fuel-tank pipe. The robot head carries an opening device for opening a fuel-tank cover plate of a vehicle. The positioning of the robot head is effected by a positioning system that includes a transceiver unit carried by the robot head and that preferably operates at microwave frequency. A passive transponder is carried by the vehicle and includes a simple code which the transponder is intended to modulate on a signal transmitted by the transceiver and is reflected by the transponder. The signal received by the transceiver from the transponder is decoded and is used to access a robot head movement plan that corresponds with that code, to automatically steer the robot head to the fuel tank pipe and thereby enable the vehicle to be fuelled. [A3105]

"Radar apparatus of automotive vehicle for producing accurate beam axis correction value"

A radar apparatus of an automotive vehicle includes a radar unit which outputs signals at intervals of a predetermined time, each signal indicating data of a position of a target at an output time. A position detecting unit detects data of the position of the target from the signals output by the radar unit when the vehicle operates in a straight line path. A correction value determining unit generates a set of errors of a beam emission axis to the straight line path with respect to a horizontal direction so that an average of the errors with respect to each of the signals is determined from the data detected by the position detecting unit. The correction value determining unit determines a correction value by taking an average of the averages of the errors with respect to all the signals. [A3106]

"Transmit power control for automotive radar system"

A radar system for detecting hazardous objects has a transceiver including a transmitting antenna for transmitting microwave power. for a side detection system, power transmission is available when the vehicle is moving forward. A signal processor receives a pulsed vehicle speed signal and a reverse signal and is programmed to terminate transmission when no speed pulse is received for a preset time or when the reverse signal is present. The transmission is terminated by removing power from the transceiver or by rerouting the microwave power from the antenna to an internal calibration circuit. Radar transmission is re-enabled when the vehicle begins to move forward again. for a rear detection system, radar transmissions are enabled when the reverse signal is present. [A3107]

"Antenna reflector"

An antenna reflector, which can reflect incoming radio waves, is formed as a corner of a cube by orthogonally connecting three reflectors which can reflect incoming radio waves. The reflectors are formed from semiconductor layers, conductive sheets scattered on one surface of the semiconductor layers, insulator films formed on both sides of the semiconductor layers, conductor films provided on the opposite surface of each of the insulator films, and switching elements that are formed on the semiconductor layers and which connect the conductive sheets. As a result, if direct current voltage is applied between the resistor films, the reflectors reflect radio waves while radio waves are absorbed when no direct current voltage is applied, and thus, the reflected radio wave is modulated by the application and non-application of the direct current voltage. [A3108]

"Velocity measurement apparatus of moving object"

A velocity measurement apparatus is disclosed which is composed of a transmitter having a plurality of elements for transmitting a signal wave, a receiver having a plurality of elements for receiving a reflected signal from a target object, and a Fourier transformation processor for two-dimensionally Fourier transforming a two-dimensional received signal in an array direction and a time axial direction of the plurality of elements of the receiver. The two-dimensional received signal is derived by repeating the transmission and reception operations a plurality of times. The velocity measurement apparatus measures a moving velocity of the target object directing to the means for receiving. [A3109]

"System and method for tracking objects using a detection system"

A system and method of tracking objects first receives returns from objects in the field of view of a detector. The sensor generates a current frame of datapoints, where an object in the field of view can be represented by multiple datapoints. The datapoints are converted into global coordinates and mapped into a next frame of datapoints and generated at a next sample time to create a new current frame of datapoints. This new current frame of datapoints is processed to form a list of objects with location and power information that includes information from one or more previous frames. This mapping and processing to form the list of objects allows the system to detect weak signal targets in a ground cluttered environment and minimizes the occurrence of false alarms. [A3110]

"Electric power steering system"

An electric power steering system of this invention can inform the driver of potential danger by providing control by way of safety precaution before a vehicle enters a dangerous situation. The occurrence of dangerous situations is determined based on a signal from an obstacle sensor. If a steering wheel is turned in a dangerous situation, a warning control is performed on a motor. The motor outputs a torque for t1 seconds, for example, which counters against turning of the steering wheel. Then, the motor enters a "non-assist" state wherein no current is applied thereto for t2 seconds. If an intermittent counter torque is applied by the motor, it is hard to turn the steering wheel and the steering wheel is caused to vibrate, thereby preventing the vehicle from being steered to collide with an obstacle and, warning the driver of the danger with vibration caused in the steering wheel. [A3111]

"Method for detecting the location of a mobile terminal"

In location detection of a mobile terminal, a location inquiry signal is transmitted from one or more base stations to the mobile terminal at predetermined intervals. In response to the location inquiry signal, the mobile terminal transmits a location signal including its identification information such as a telephone number. The location signal is received by at least three base stations neighboring to the mobile terminal. The respective distances from that base stations to the mobile terminal are calculated based on the respective field strength values of the location signal received by the base stations, and the location of the mobile terminal is detected based on the calculated distances. More specifically, the location is calculated as an intersection of the respective circles defined by radiuses of the calculated distances from the base stations receiving the location signal. [A3112]

"CDMA communications and geolocation system and method"

A spread-spectrum CDMA communications system for locating remote units, and for communicating message data between a plurality of remote units and a base station. The spread-spectrum CDMA communications system includes a plurality of base stations and a plurality of remote units. A base station has a spread-spectrum modulator for spread-spectrum processing the message data, and a transmitter for transmitting the spread-spectrum processed-message data, combined with a generic-chip-code signal, from the base station to a remote unit. The base station also has an antenna, and spread-spectrum detectors for recovering message-data communicated from the remote-units. A remote-unit has an antenna, and a detector coupled to the antenna for recovering data communicated from the base station. The detector includes a spread spectrum demodulator. Also, the remote unit has a device for converting the format of the data into a form suitable for communicating over radio waves, a spread spectrum modulator and a transmitter. The base station has a range circuit, which comparers the generic-chip-code signal generated at the base station with the generic-chip-code signal received from the remote unit, for determining a range between the remote unit and the base station. [A3113]

"Method and system for regional traffic monitoring"

A method and system is disclosed for remote all-weather monitoring of civilian road traffic over large portions of a metropolitan region, using one or more microwave radar systems situated at elevated locations, such as high towers or pilotless aircraft. Pulse-Doppler waveforms provide, for each position of the radar beam, range-velocity maps of traffic over a number of selectable roadway sections, which maps are used to estimate the speed, density, and volume of traffic flow and to identify discontinuities in the flow which may be indicative of accidents or obstructions. In addition, a high-resolution wideband waveform can be included to provide detailed examinations of selected portions of the monitored roadway sections. [A3114]

"Transponder charging apparatus"

Apparatus for automatically charging a transponder mounted to a go-cart. The transponder charging unit is basically comprised of a housing having a wall which divides its space into first and second compartments wherein a PC board and a transponder are at least partially contained, respectively. A cover plate secures and protects the PC board and transponder within the housing. A wire is spliced into the go-cart's coil grounding wire to extract A/C power therefrom and send it to the PC board. The PC board contains several solid state devices to rectify and regulate the voltage. Wires extend from the PC board's output to charging contacts operatively connected to the transponder's battery, thereby providing a charge thereto. Thus, the transponder's battery, is continually being charged while the go-cart's engine is running. [A3115]

"Layered dual frequency antenna array"

A dual frequency array antenna comprises an upper layer including an array of antennas operating at a first frequency, a first ground layer disposed below the upper layer at a predetermined distance and a dielectric material disposed between the first ground layer and the upper layer. An array of slot radiator apertures are provided in the first ground layer. The apertures are spaced from the array of antennas and radiate at a second frequency. An array of feed lines is disposed at a predetermined distance below the first ground layer with one of the feed lines below each one of the apertures. A second ground plane layer is disposed at a predetermined distance below the array of feed lines. The two frequencies are, for example, from two distinct microwave bands. [A3116]

"System for the identification and automatic detection of vehicles or objects"

A system for the identification and automatic detection of vehicles or objects includes an electronic label installed in each of the vehicles or objects, each of these electronic labels having means for memorizing an identification code assigned to a vehicle or object in which the electronic label is installed and radioelectrical transmission and reception means for transmitting this identification code, and at least one mobile reader disposed exterior to the vehicles or objects and movable within a vicinity of these vehicles or objects. Each mobile reader includes a recording memory for recording a file of identification codes of vehicles or objects to be identified, radioelectrical means for transmitting a signal to at least one of the vehicles or objects which prompts the electronic labels of these vehicles or objects to transmit identification codes assigned to these vehicles or objects to the radioelectrical means, comparison means for comparing the identification codes recorded in the file of the recording memory with each identification code transmitted by the electronic labels, and reporting means for reporting to authorities the presence of any vehicle or object whose identification code appears in the file of the recorded memory, as determined by the comparison means. The invention finds particular utility in the automatic detection of stolen vehicles, the purchase of second hand vehicles, and identity checks on motorists. [A3117]

"Window-closing safety system"

A safety device includes a wire loop embedded in the glass of a passenger car window and routed near the closing leading-edge of the window. The wire loop carries microwave pulses around the loop to and from a transceiver with separate output and input ports. An evanescent field only and inch or two in radius is created along the wire loop by the pulses. Just about any object coming within the evanescent field will dramatically reduce the energy of the microwave pulses received back by the transceiver. Such a loss in energy is interpreted as a closing area blockage, and electrical interlocks are provided to halt or reverse a power window motor that is actively trying to close the window. [A3118]

"Excavator data acquisition and control system and process"

An information acquisition and control system and process acquires geological information from a subsurface and modifies the operation of an excavating machine using the acquired geological information. The system includes a data acquisition system to acquire geological information along an excavation route, a machine controller to control the operation of the excavating machine, and a main controller that produces estimated machine performance parameters for use by the machine controller using the acquired geological information and machine operation information. In another embodiment, geologic characteristics acquired for a first subsurface are associated with excavation performance information for the first subsurface to produce correlation data. Geologic characteristics acquired at a second subsurface are compared with the correlation data to produce estimated excavation performance information for the second subsurface. [A3119]

"Method and apparatus for operating a surface detection surveillance radar using frequency agile pulse transmissions"

In accordance with the principles of the invention, a surveillance radar is provided with a rotating, frequency squinting, end-fed slotted array antenna, which is caused to transmit a plurality of different carrier frequency pulses for successively illuminating specific antenna beam positions during rotation of the antenna. Upon reception of each radar signal return, a signal processor responsive to the frequency of each transmitted pulse and the mechanical pointing angle of the antenna at the time of transmission of each pulse, will determine the frequency dependent squint angle for the transmitted pulse and combine that angle with the instantaneous mechanical pointing angle of the antenna at the time of the pulse transmission, to determine the actual beam pointing angle for each pulse at the time of its transmission. A video signal processor groups together the pulse signal returns from physically adjacent ones of the actual beam pointing angles for common processing, i.e, integration, for improving the target detection performance of the radar system. [A3120]

"Vehicle-surroundings monitoring apparatus"

A plurality of radar devices are provided on and along the periphery of a vehicle for monitoring in different directions. While sequentially switching the radar device to be used for the monitoring operation in response to a transmission-enable signal, a processing device detects, for each direction, presence of and distance to an obstacle or object on the basis of a phase difference (time difference) between signals transmitted and received via the corresponding radar device. Thus, the processing device causes an image display device to show the detected conditions around the vehicle and also causes a sound synthesizer to output a sound message to call the vehicle operator's attention. [A3121]

"Vehicle occupant position and velocity sensor"

An occupant position sensor utilizing either ultrasonic, microwave or optical technologies, or seatbelt spool out and seat position sensors, are used as inputs to the primary vehicle crash sensor circuit to permit the longest possible sensing time before the occupant gets proximate to the airbag and is in danger of being injured by the deploying airbag. The sensor further disables the inflatable restraint system if the occupant is in danger of being injured by the system deployment. Separate systems are used for the driver and passenger to permit the optimum decision to be made for each occupant. [A3122]

"Adjustable zone security system"

Security systems which include an adjustable structure and a motion detector which detects changes in electromagnetic energy from within a zone of protection are described. The structure has a base for mounting the motion detector and wall members which extend away from the base and to form walls around the detector. The wall members are adjusted to positions between the plane of the base and planes perpendicular to the base to alter the shape of the zone of protection and conform it to the area or object of interest. The motion detector is electrically connected to a control unit and alarm module which includes a shock sensor and a current sensor. The motion detector and the control unit and alarm module are connected to a power supply and operated by remote control. [A3123]

"Automotive rear safety detection system"

An automotive rear detection system which assists a driver by informing whether an obstacle is present when the vehicle is in a reverse motion. The alarm is activated by transmitting an audible noise to warn the driver. The signals are monitored by detectors which uses frequency modulation current wave mode to recognize whether objects are present within approximately eight feet regardless if it is in motion or not. The detectors send a signal to a control box mounted inside the vehicle which activates the alarm. [A3124]

"Traveling control system for motor vehicle"

A traveling control system for a motor vehicle includes a detector for detecting an object which exists in front of the motor vehicle to follow a vehicle traveling ahead. The system further includes a first course determination device for estimating a first course on which the motor vehicle will travel hereafter, an identification device for identifying an first target vehicle among the objects existing on the first course, and a second course estimation device for estimating, based on the first target vehicle, a second course on which the motor vehicle will travel hereafter at least while the first target vehicle is outside of the first course. The identification device identifies a second target vehicle among vehicles which travel on the first or second courses while the first target vehicle is outside of the first course. [A3125]

"Microburst detection system"

A radar station utilizes fuzzy logic processing to detect atmospheric microburst events. The detection process accesses radar velocity measurements to calculate wind shear and produce a wind shear likelihood image. Reflectivity measurements are used to create a reflectivity likelihood image as an indicator of storm activity. A clutter image of stationary objects close to the radar is used to create a clutter likelihood image as an indicator of false alarms. A weighting factor is applied to each set of wind shear, reflectivity, and clutter likelihood data, and the values are combined to produce a combined likelihood image. The combined likelihood image is subjected to averaging over a fixed area to eliminate spurious readings, and positions having a sufficient size in combination with a likelihood value exceeding a minimum threshold amount are selected as microburst events. [A3126]

"Transponder detection system and method"

A transponder detection system for detecting the presence at a detection area of a vehicle on which the transponder is mounted. Two antenna arrays are located on opposite sides of the detection area, and have their boresights directed to the detection area. for each array, a sum and difference signal of signals received from the transponder are measured. The sum channel signal is used to establish whether a transmission has occurred, and the difference channel signal is used to isolate any transponder that is at the detection area. [A3127]

"Method and apparatus for controlling a biphase modulation to improve autocorrelation in pseudorandom noise coded systems"

This invention relates to a method and apparatus for controlling a biphase modulator (602, 702) to improve autocorrelation in pseudorandom noise coded systems. The biphase modulator modulates a carrier frequency with one of two phase states responsive to a pseudorandom noise (PN) binary code sequence. The spectrum (610, 710) at the output of the biphase modulator comprises a plurality of spectral lines separated by the code repetition frequency, including a center spectral line (611, 711) and at least one adjacent spectral line (612-615, 712-717) . The magnitude of the center spectral line is measured and compared to a reference to produce a control signal which is responsive to the magnitude of the center spectral line. This control signal is supplied to the biphase modulator for maintaining a predetermined magnitude of the center spectral line thereby achieving a desired spectrum output and improving autocorrelation of the system. [A3128]

"Performance matching of weather avoidance radar"

The invention of this patent is related to unit-to-unit performance matched radar provided by automatic compensation based on software mapping of calibration data over an dynamic operating range of temperature and radar return signals. [A3129]

"Coherent, frequency multiplexed radar"

Coherent, frequency multiplexed radar is a new generic type of continuous wave radar architecture wherein contiguous pulses of discrete frequency segmented signals are serially transmitted from an antenna, and after reflection from radar targets, signals from the same antenna are coherently processed in a parallel manner to provide correlated measurements of target's pulse compressed range and radial velocity. Simultaneously transmitted and received signals are separated by frequency multiplexing. [A3130]

"Method for avoiding collision of vehicle and apparatus for performing the same"

An apparatus which determines a kind of an object to warn a driver based on the kind of the object and properly performs deceleration and braking operations based on a position of the object and a speed of the vehicle is disclosed. An infrared-ray camera is employed to detect a shape and a temperature of the object. A digital signal processing technique is utilized for displaying the temperature distribution of the object. Therefore, using the apparatus, it is able to distinguish the shape and the kind of the object in the night time and the vehicle is suitably decelerated and/or stopped based on conditions. [A3131]

"Portable geophysical system using an inverse collocation-type metehodology"

The invention pertains to a hand-held or vehicle mountable portable procer based high resolution radar system for detecting and identifying an object by using high resolution radar. In particular, the invention concerns using radio waves for identifying a depth and material of an object within a media. This system can perform target and media identification in real-time. This process is achieved by the system's processor where the media identification results can be visually displayed on an output unit. The generated carrier signal used in the radar system is an exponentially decaying superimposed direct and alternating signal. The frequency of the carrier signal can be in the microwave region. The system performs analog to digital (A/D) conversion using integrated circuitry whose sampling rate is in the same as the carrier signal transmission rate. In addition, Fourier and Hilbert transforms of the observed signal is generated for frequency domain analysis of the observed object to be identified and a profile inversion methodology for real time analysis. To achieve high resolution results, digital codes such as Barker, Welti, or Frank codes are used in the processor. The carrier signal is coded using a digitally controlled phase shifter. Power usage by the instant invention's radar system is low. The profile inversion methodology is a real time based analysis. [A3132]

"Backscattering transponder switchable between a modulator/demodulator and ground"

An electronic toll system for monitoring a plurality of lanes including a plurality of lane monitoring devices operative to monitor passage of vehicles through the corresponding plurality of lanes, and a lane monitoring device coordinating system for coordinating operation of the lane monitoring devices such that not all of the lane monitoring devices operate simultaneously. [A3133]

"Target prediction and collision warning system"

A device for target prediction and collision warning for tracking objects in a region proximate to a vehicle includes a signal transmitter which provides first and second detection signals for at least partial reflection by an object located in a spatial region. The device further includes a signal receiver for receiving the deflected first and second detection signals corresponding to first and second parameter signals. A Fourier transform circuit is provided for receiving the first and second object parameter signals and generating first and second Fourier transform object parameter signals corresponding to relative range and velocity data of a target being tracked. The device includes a probabilistic neural network which preferably sorts the first and second Fourier transform object parameter signals corresponding to the relative range and velocity of a target being tracked. Operatively coupled to the probabilistic neural network is a target tracker circuit which receives the sorted first and second Fourier transform object parameter signals after at least three samples of relative range and velocity data have been measured. The target tracker generates an output signal indicative of a prediction of regression parameters of a second order or higher order equation that characterizes the change in relative range and velocity of the target being tracked. [A3134]

"Alarm system for swimming pools"

A sonar, lidar, or radar system generates an alarm signal if a child enters a swimming pool when the system is enabled, and includes multiple safeguards against sounding false alarms due to wind-activated waves in the pool or self interference arising from multi-path propagation of the sonar signals. An acoustic or electromagnetic receiver having a narrow bandwidth is employed to demodulate a composite signal spectrum produced by a target object such as a child and signals generated by wind-activated waves. It also performs an envelope amplitude monitoring function to suppress false alarms that might be generated by low amplitude envelopes of the type created by self interference. In a first embodiment, an alarm signal is generated only if the demodulating function and the envelope amplitude monitoring functions both indicate a legitimate alarm. In additional embodiments, still further redundancies are added to further decrease the probability of a false alarm, but none of the redundancies reduces the probability of recognizing legitimate signals. [A3135]

"Apparatus for and method of preventing car collision utilizing laser"

An apparatus for and a method of preventing a car from coming into collision with an object car running ahead or behind, by monitoring car running conditions in the front and rear of the car by the provision of front and rear sensors to give an alarm to the front and rear object cars when an emergency situation has monitored, sensing a slope of a road surface on which the car runs to remove an error caused by an inclination of the car, sensing a handle rotation of the car to enable the car to follow the front object car on a curved road and to be informed of situations in the front and rear of the car on the curved road, establishing a sufficient safety distance, and sensing an emergency situation occurring in the rear of the car to inform a driver of the rear object car of the emergency situation by the provision of a display. When a rotation of the handle is detected, the front and rear sensors are rotated in a direction corresponding to that of the rotation of the handle by an amount corresponding to a rotation angle of the handle, while when a slope of a road surface on which the car runs is detected, the front and rear sensors are rotated in a direction reverse to that of the road surface slope by an amount corresponding to a gradient of the slope at a point of an estimated slope beginning time. [A3136]

"Sensing apparatus"

An apparatus for determining various physical quantities such as temperature, pressure, stress, strain, distance and the like in a manner such that a change in the physical quantity of interest results in a measurable change in the frequency of oscillation of a signal generated within the apparatus. [A3137]

"Object sensing apparatus using predicting means for Determining if the object is a guardrail"

An obstacle sensing apparatus uses an FM-CW wave as an emitted wave to an object in front of a car. A received wave from the object is mixed with the emitted wave to produce a beat signal which is analyzed in frequency to measure a distance and a relative speed with respect to the object. A distance and a relative speed at the next time is predicted from the measured distance and relative speed. The object is determined to be a car if the relative speed does not have an approaching direction or substantially the same value as a sensed car speed. The object is otherwise determined to be at least one of a guardrail and a sound barrier if a difference between the measured distance and the predicted distance exceeds a preset value and a plurality of the last measured distances are substantially constant. The object is otherwise determined to be a stationary object other than the guardrail. [A3138]

"Radar method and device for carrying out the method"

A radar method and a device for carrying out the method include estimating an azimuth angle of each target object from determined variables of distance or range, relative speed and relative acceleration after Kalman filtering and separating out target objects having a physically impossible behavior (tracking and prediction) . That is used to determine which target objects are located on a roadway occupied by a vehicle and which are the most dangerous thereof. Indication, warning or action thresholds are determined as a function of driving behavior of the driver, road conditions and weather conditions. Indication, warning or action signals (in the brakes, throttle valve or gear shift of the vehicle) result if the thresholds are exceeded or undershot by the range, the relative speed and the relative acceleration. [A3139]

"Cruise control systems for motor vehicles"

A cruise control system for a motor vehicle includes a forward looking distance sensor adapted to sense vehicles moving in the same path as the equipped vehicle or in paths adjacent to the equipped vehicle, the system tracking vehicles in front of or in paths adjacent to the equipped vehicle and controlling braking or acceleration of the equipped vehicle in response to vehicles travelling in front of or on converging paths with the equipped vehicle, in order to maintain a safe distance between the equipped vehicle and vehicles in or entering its path. [A3140]

"Method for simultaneously measuring the positions of more than one surface in metallurgic processes"

A method for measuring the position of at least one surface in a metallurgical process which includes the steps of providing a metallurgical melt, the metallurgical melt including at least a metal portion and a slag layer, providing a signal generator for generating signals at a plurality of frequencies over a frequency band, and providing an antenna for receiving the signals generated by the signal generator and for transmitting circularly polarized radio waves at the plurality of frequencies over the frequency band. The invention further includes the steps of disposing the antenna adjacent the metallurgical melt, transmitting the circularly polarized radio waves from the antenna toward the metallurgical melt, the circularly polarized radio waves being transmitted by the antenna at the plurality of frequencies over the frequency band, receiving reflected images of the transmitted radio waves through the antenna, the received reflected images of the transmitted radio waves having a substantially opposite circular polarization from the transmitted circularly polarized radio waves, determining a phase displacement between the transmitted radio waves and the received reflected images of the transmitted radio waves, transforming the determined phase displacement from a frequency to a time plane, and determining from the time plane transform a position of at least one surface of at least one of the metal portion and the slag layer. [A3141]

"Method and apparatus for alerting pilot to transponder antenna failure in a traffic alert and collision avoidance system"

A system for use with aircraft having a collision avoidance system which employs i) two transponder systems each including two antennas and a selected one of two transponders and ii) a failure warning when a transponder system failure occurs, to permit the aircraft to take off when the failure warning is the result of only one antenna failure. [A3142]

"System and method of installation for locating a hidden sensor externally active on a motor vehicle"

To hide, and protect a transducer (2) , such as an ultrasonic, infrared transducer or the like, located on an outer surface part (1) of a vehicle, for example within a recess in a bumper, from vandalism or other damage, the transducer is located on the outer surface part (1) to be flush with the outer surface thereof, and a cover (4) is located on said outer surface part. The outer surface part (1) , as is customary has a predetermined surface shape or contour, and the outer surface cover (4) matches and engages that predetermined outer surface part of contour. Preferably, the transducer is an ultrasonic transducer terminating in a membrane (3) which is located flush with the outer surface of the outer surface part (1) , and acoustically coupled, for example by an adhesive (5) , with the outer cover (4) to reduce damping of signals from the transducer, and of echo signals from an object received by the transducer, and passing through the outer cover. The material of the cover is preferably so selected that it has sufficient hardness and stiffness for good matching with the transducer. The method and system is suitable for combination with a parking assistance system (10, 11) . The cover location of the transducer (2) prevents visual identification of the transducer, so that there is no interference with the visual aspect of the vehicle, and damage to the transducer, inadvertently or by vandalism, is effectively eliminated. [A3143]

"Tubular sonic displacement sensor"

The displacement sensor of this invention comprises a tube combined with a sonic transmitter and receiver. The tube acts as a waveguide for the sonic waves and a processor determines whether the tube has changed in length or has been constricted which, in either case, changes the pattern of sonic waves traveling from the transmitter to the receiver. In some applications, the transmitter and receiver are at different ends of the tube. In these cases, the attenuation in sound energy reaching the receiver, caused by the tube being squeezed at at least one point, is measured and the amount of cross action area reduction is determined. In other applications, the transmitter and receiver are at the same end of the tube and, in some of these cases, the transmitter and receiver are the same transducer. When the transmitter and receiver are at the same end of the tube, the receiver receives sonic waves reflected from a constriction in the tube and the time between transmission and reception of the waves permits the processor to determine the location along the tube of the constriction. The measuring device of this invention can also be used to measure the change in length of the tube or effective length, such as when the tube is partially filled with a liquid. [A3144]

"Vehicular safety distance alarm system"

A vehicular safety distance alarm system for monitoring a travelling distance between a source vehicle and a target vehicle and activating an alarm when a predetermined safety distance defined between the two for a given speed is compromised comprising a distance measurement mechanism coupled to a source vehicle for determining and transmitting a distance signal representing a travelling distance between the source vehicle and a remote target vehicle, a selection mechanism coupled to the source vehicle for allowing a driver to select a desired range of safety distances expressed as a function of source vehicle velocity and a set time to reach a target vehicle, an alarm signal generation mechanism coupled to the distance measurement mechanism and selection mechanism for comparing the distance signal to a safety distance at a given source vehicle velocity and transmitting an alarm signal when the safety distance is compromised, and an alarm mechanism coupled to the alarm signal generation mechanism for providing an indication upon receipt of an alarm signal. [A3145]

"Wide-angle multiple-doppler radar network"

The sky is scanned with transmitted radar pulse beam of electromagnetic radiation from a high gain antenna with a narrow viewing angle. Weather echos from the radar pulse are monitored with a low gain receiving antenna that has a wide, or moderate, viewing angle of the sky. The source location of echo signals along the direction of the radar pulse beam path are defined by synchronizing the sampling of the echo signal at the receiving station with the transmission of radar pulses at the transmitting station. The receiving station defines the location of an echo signal source by knowing the locations of the transmitting and receiving antennas, the pointing angle of the transmitted beam and the relative time between transmission of the radar pulse and receipt of each echo signal sample along the transmitted beam path. The relative time can be defined by synchronizing the sampling of the echo signal with each transmitted pulse. [A3146]

"Vehicle-ground surface measurement system"

A measurement device (103) and method determines various metrics between a vehicle (101) and a ground surface (105) using a transmitter-antenna (109) for emitting energy including a portion directed down toward the ground surface. A receiving antenna (115) , has a portion oriented facing toward the transmitter-antenna for receiving a portion of the emitting energy along a direct path (117) , and a portion oriented facing downwardly toward the ground surface for receiving a portion of the emitting energy reflected from the ground surface along a reflected path (113) . A decoder provides separate indications of forward (121) and sideward (123) velocity relative to motion of the vehicle along the ground surface. Furthermore, the decoder comprises means for determining vehicle height (125) dependent on a measured difference in path length, vehicle level (127) , or front to rear tilt angle, dependent on polarization elliptical ratio changes, and road surface conditions (129) dependent on amplitude and phase changes that occur versus time. [A3147]

"Multi-stage transponder wake-up, method and structure"

A system and method which conserves energy in the operation of a transponder or tag (14) by providing that the transponder (14) be enabled or awakened in multiple stages. A threshold detector (62) is provided which measures the power level of received RF energy. If the RF energy received by the detector (62) exceeds a pre-determined level, the transponder (14) then employs a modulation detector (64) to ascertain whether it has been awakened by a valid interrogation signal from an interrogator (12) or whether the RF energy received was merely a spurious burst of RF energy from some other source. If a pre-determined modulation is detected by the modulation detector (64) , the transponder (14) is then fully activated to its normal operational state. [A3148]

"Multichannel radar system for motor vehicles"

A multichannel radar system for use on a motor vehicle has a plurality of transmission and reception channels each composed of an AM or FM signal generator for generating an AM or FM signal including a carrier which is amplitude- or frequency-modulated by a modulation signal, transmission and reception antennas for radiating the generated AM signal and receiving a return signal reflected by an obstacle, an amplifier for amplifying the received return signal, and either a detector for detecting the amplified return signal or a mixer for mixing the amplified return signal with the FM signal generated by the FM signal generator thereby to generate a beat signal. A power supply circuit supplies DC voltages respectively to the AM or FM signal generators and the amplifiers of the respective transmission and reception channels in a time-division multiplex manner at successive times. A processor calculates a distance up to the obstacle based on either the phase difference between the detected return signals and the modulation signals or the frequencies of the beat signals in the respective transmission and reception channels. [A3149]

"Low-cost near-surface burst (NSB) capability for proximity fuzes"

System and modifications are presented which allow existing artillery and rtar projectile proximity fuzes to have a near-surface burst (NSB) option enabling low height of bursts ranging between one and three meters. The additional circuitry needed to implement this NSB into an existing fuze is a single operational amplifier. The velocity of the fuze is calculated by the micro-controller counting the number of Doppler cycles over a pre-determined sample period of time. Thereafter, using the fuze velocity, the delay time needed for a NSB detonation is computed. [A3150]

"Radar-based method of level measurement"

In a method of level measurement on a radar basis, microwaves are emitted by means of an antenna to the surface of a material in a container and the echo waves reflected from the surface thereof are received. An actual echo function representing the echo amplitudes as a function of the distance is formed from the echo waves received by the antenna for each measurement, the probable useful echo and the transit time thereof are established from the actual echo function, and the distance of the material surface from the antenna is determined therefrom. To recognize the formation of a deposit and/or other trouble, such as e.g. damage to or loss of the antenna, an undisturbed echo function corresponding to an undisturbed measurement is obtained and stored prior to performing the measurements. In each measurement the actual echo function is compared to the stored undisturbed echo function. When due to the comparison, deviations between the two functions are found in the antenna region and the proximity zone, these deviations are evaluated to recognize the formation of a material deposit and/or other trouble. [A3151]

"Apparatus and method for motion detection and tracking of objects in a region for collision avoidance utilizing a real-time adaptive probabilistic neural network"

Apparatus for motion detection and tracking of objects in a region for collision avoidance includes a signal transmitter which provides first and second detection signals for at least partial reflection by an object located in a spatial region. The apparatus further includes a signal receiver for receiving the deflected first and second detection signals corresponding to first and second object parameter data signals. The apparatus further includes a Fourier transform circuit for receiving the first and second object parameter data signals and providing first and second Fourier transform object parameter data signals. The apparatus further includes a probabilistic neural network for receiving and sorting the first and second Fourier transform object parameter data signals without the use of a priori training data. [A3152]

"Vehicle radar for excluding a vehicle changing a lane from targets to track"

A vehicle radar includes a vehicle in front from being a target when the vehicle shifts to another lane by decreasing certainty of the vehicle as the target. The vehicle radar calculates a relative distance and a relative speed between each of target objects and a vehicle on which the vehicle radar is provided by transmitting forwardly a frequency modulated carrier wave and receiving the carrier wave reflected by each of the target objects. A certainty level represented by probability of existence of the target objects is calculated based on a relationship between a currently detected condition of the target objects and a previously detected condition of the target objects. The certainty level of the target objects is changed when it is determined that the target objects move away from a lane in which the vehicle is moving so that the target objects are excluded from targets to track. [A3153]

"Combined motion detector/transmitter for a traffic information warning system"

A combined motion detector/transmitter device for a traffic information warning system is disclosed. The device includes first and second oscillators for transmitting first and second carrier signals, respectively. The first carrier signal has a first carrier signal frequency and the second carrier signal has a second carrier signal frequency. The carrier signals are used to transmit a message regarding a traffic situation based upon either the magnitude of the frequency difference between the first and second carrier signal frequencies or the specific frequency locations of the carrier signals. The first and second oscillators also set up first and second disturbance fields, respectively. A first reflected signal receiver is associated with the first oscillator and receives a first reflected signal when a target is within the first disturbance field. A second reflected signal receiver is associated with the second oscillator and receives a second reflected signal when a target is within the second disturbance field. First and second detector circuits are provided for detecting the presence or absence of a moving target in the first and second disturbance fields, respectively. Finally, the device includes an indicator for indicating the detected presence of a moving target in either the first or second disturbance fields. [A3154]

"Phase difference microwave densitometer and method which detects a number of phase rotations through a reference point"

A phase difference measuring apparatus obtains a first receive signal by transmitting and receiving a to-be-measured material in a reference state and a second receive signal by transmitting and receiving a signal wave to and from that material in a measured state. The apparatus finds a reference phase difference .theta..sub.1 from the transmit wave and first receive signal and an apparent phase difference .theta..sub.2' from the transmit wave and second receive signal. The apparatus adds the apparent phase difference .theta..sub.2' to a product of the number of rotations, n, the apparent phase difference .theta..sub.2' passes through a given reference point and an angle of 360.degree. to find a true phase difference .theta..sub.2. The apparatus varies the number of rotations, n, to n+1 when the apparent phase difference .theta..sub.2', while being increased, passes through the reference point and that number of rotations, n, to n=n-1 when the apparent phase difference .theta..sub.2', while being decreased, passes through the reference point. [A3155]

"Informational/training video system"

The present invention provides a video-based, combined informational/training system for user activity related applications. In one embodiment, the system (2) includes a video recording assembly (10) and a measuring device (4) located at a user activity site (6) such as a tee box of a golf driving range. A video tape (60) , including activity specific information on a first, pre-recorded portion thereof, is provided to the user for use in the video recording assembly (10) at the user activity site (6) . The video tape (60) is cued for recording user specific information on a second portion of the video tape (60) during a practice session. The sensor (4) determines corresponding parameter information, such as estimated golf ball carry distance, for display on video tape (60) . The video tape (60) and video recording assembly (10) cooperate to provide a mechanism for preventing or discouraging use of unauthorized tapes and to ensure proper usage of the system (2) . [A3156]

"Electronic multi-purpose material level sensor"

The present electronic multi-purpose material level sensor is based on time domain reflectometry (TDR) of very short electrical pulses. Pulses are propagated along a transmission line that is partially immersed in a liquid, powder, or other substance such as grain in a silo. The time difference of the reflections at the start of the transmission line and the air/liquid interface are used to determine levels to better than 0.01 inch. The sensor is essentially independent of circuit element and temperature variations, and can be mass produced at an extremely low price. The transmission line may be a Goubau line, microstrip, coaxial cable, twin lead, CPS or CPW, and may typically be a strip placed along the inside wall of a tank. The reflected pulses also contain information about strata within the liquid such as sludge-build-up at the bottom of an oil tank. [A3157]

"Bistatic angle-cued radar system and processing method"

A radar system and method employing a radar with an electronically scanned antenna array for estimating range and range rate to a target using angle cueing only. The radar transmits radar pulses at the target and searches the projection of the line-of-sight to the target on the ground for ground-bounce returns associated with each transmitted pulse. A processor coupled to the radar and processes the ground-bounce returns to determine an angle corresponding to the maximum reflected multipath ground-bounce return when the antenna array scans the ground. The angle data derived from processing the multipath ground-bounce returns permits computation of the range to and range rate of the target. [A3158]

"Mobile unit identifying system and method of demodulating for the same"

A first mobile unit identification system having a interrogator and responder. The interrogator transmits a given magnitude of a spread spectrum coded signal in standby mode. The responder receives the spread spectrum coded signal and when the magnitude of received signal exceeds a given value, it reflects the transmitted spread spectrum coded signal with ID code when the magnitude of received signal exceeds the given value. The interrogator receives this and then, transmits data to the responder with amplitude modulating the spread spectrum coded signal with the data. The responder detects by amplitude demodulation and stores the detected data. The interrogator may transmit a mode change code. The responder may transmit an end code after transmission of a data train. A second interrogator informs the responder of the standby mode thereof by amplitude-modulated signal having a given cycle. A second responder judges whether or not the second interrogator is in standby mode by detecting the cycle and sends a communication requesting signal Q to the second responder and then, transmits ID code. In response to the signal Q, tile second interrogator transmits a signal having a fixed magnitude. A method of modulating for the mobile unit identifying system is also disclosed. [A3159]

"Detection object searching device"

The invention provides a detection object searching device which makes it possible to immediately know the direction of a mobile detection object such as a car by information presented on a display of a portable unit. The detection object searching device includes a portable operation unit and a body unit. The operation unit includes a transmission section for transmitting a search signal upon operation of a transmission button, a receiving section for receiving a direction indication information signal, an absolute direction detecting section for generating an absolute direction signal, a control section for generating direction indication information indicating the direction of the car based on the direction information signal and absolute direction signal, and a display section for displaying the direction indication information. The body unit includes a direction detection receiving section which searches the incoming direction of the search signal and generates an incoming direction signal, an absolute direction detecting section for generating an absolute direction signal, a control section for generating a direction information signal indicating the direction of the car with respect to the operation unit 1 from the incoming direction signal and absolute direction signal, and transmission section for transmitting a direction information signal. [A3160]

"Radar system"

A radar system having a transmitter for transmitting a series of radio frequency (RF) pulses with sequential, incrementally changing carrier frequencies. A receiver receives energy from multiple scattering points of an object reflecting such transmitted RF pulses. The received energy from each one of such scattering points includes a series of radio frequency (RF) pulses corresponding to the transmitted pulses delayed in time, .tau., from the transmitted pulses an amount proportional to the range to such scattering point and shifted in frequency from the carrier frequency an amount proportional to the velocity of such scattering point. The receiver includes a heterodyning section, responsive to a range tracking error signal, .epsilon..sub.R, and a velocity tracking error signal, .DELTA..sub.VEL, for producing a series of pulsed signals for each one of the scattering points. Each one of the pulsed signals for any given scatterer sequentially changes in phase, .phi., at a rate, .DELTA..phi./.DELTA.T, related to the range to the scattering point producing such one of the pulsed signal series. A processor, responsive to each of the series of pulsed signals produced by the heterodyning section, unambiguously determines from the frequency spectrum thereof the range tracking error signal, .epsilon..sub.R, and velocity tracking error signal, .DELTA..sub.VEL, for each of the scattering points as well as the range centroid. [A3161]

"Ferro-electric frequency selective surface radome"

Ferro-electric frequency selective surface radomes that have dielectric layers that comprise voltage controlled material, and the electrical properties of the dielectric layers are voltage controlled. By varying the dielectric properties, the passband frequency of the radomes can be shifted to optimize frequency and angular response of the frequency selective surface. The radomes comprise grating screens having a plurality of printed radiating elements. Inner and outer voltage controlled dielectric layers are disposed on the grating screens. Relatively high ohms per square resistive films are disposed on exposed surfaces of the voltage controlled dielectric layers. In one embodiment, voltage control circuitry is coupled to the respective resistive films for controlling the voltages applied to the respective voltage controlled dielectric layers by actively varying the dielectric permittivity of the resistive films around a small percentage of its nominal value to provide a ground on outer surfaces of the dielectric layers. In another embodiment, the ferro-electric frequency selective surface radome may comprise voltage controlled dielectric layers disposed on one surface of the grating screens. Voltage control circuitry is coupled to the first and second grating screens for controlling the voltages applied thereto and thus the performance of the radome. [A3162]

"Electromagnetic wave reflective type, low cost, active proximity sensor for harsh environments"

A low power, low cost, millimeter wave (MMW) proximity sensor that provides over a 6: 1 increase in minimum detection range (55 mm minimum) compared to standard 18 mm inductive proximity sensors preferably includes a low cost MMW Gunn oscillator, MMW detector and analog processing/driver circuitry. The sensor is preferably designed for 3-wire operation and will fit in a standard 18 mm tube. [A3163]

"Velocity detecting system"

A velocity detecting radar unit that is easy to operate and to view so as to minimize distraction to the operator, particularly when in use in a moving vehicles includes a spotlight unit having a housing with a lens, a light source within the housing and a control wand pivotally mounting the housing for rotation about an axis and including an elongated tube adapted to extend through the windshield pillar of a vehicle. A radar antenna is mounted in the housing to be movable therewith and has a radar transmitting and receiving end extending from the housing oppositely of the spotlight lens. A display module is adapted to display velocity data and other information and is adjustable mounted to the tube at a location thereon remote from the spotlight housing. Similarly, an input or control module including function switches for providing function commands to a controller for the unit is provided and is adjustable mounted to the tube at a location thereon remote from the housing. [A3164]

"Vehicle obstacle avoidance system"

A system for warning a vehicle driver of obstacles to the front, rear and sides of the vehicle. If the vehicle is stopped and a front or rear obstacle is detected, the vehicle is prevented from moving forward or reverse, respectively. The inhibition of movement can be overridden by the driver once he acknowledges the obstacle. Similarly, the driver is warned of front, rear and side obstacles while the vehicle is moving. In the case of side obstacles, only when it appears that the driver will move the vehicle toward the obstacle is he warned. [A3165]

"Method and system for object detection within an angular zone, and its applications"

A method for detecting fixed or moving objects within an angular zone, as may be used in vehicle anti-collision systems, employs separate and distinct transmission and reception patterns. The transmission pattern successively illuminates consecutive segments of the angular zone. The reception pattern receives echo signals in parallel from illuminated objects in each zone segment. The echo signals are then digitally beam formed into a total field signal. The angular positions of the detected objects are then derived from the total field signal. [A3166]

"Two-way cable TV conversion system for data transmission over a dedicated frequency band"

A bidirectional cable television system provides for transmission of signals from cable subscribers downlink in the same direction as the ensemble of television channels which the cable television system is already constructed to deliver. The subscriber signals may be transmitted over the cable in the blanking intervals of a cable television channel, using the T-NET technique described in U.S. Pat. No. 4,750,036. Alternatively, the signals may be carried over a dedicated channel, or transmitted cochannel along a cable television channel carrying ordinary programming by adding the subscriber information to alternating video frames in alternating polarity to achieve visual cancellation. The subscriber signals are collected after the last distribution line amplifier in the cable downlink. The collected signals are transmitted to a central receiver via wireless or other customary means such as a modem. The collected signals may alternatively be transmitted over the air to the central receiver in the blanking intervals of a broadcast television channel using the T-NET technique. [A3167]

"Electronic baffle and baffle controlled microwave devices"

Microwave devices incorporate at least one photosensitive baffle that is selectively illuminated changing the baffle's electronic characteristic from being transparent to being reflective of microwave energy. The baffle serves as a gate, tuning element, reflector and the like. Various forms of photosensitive baffles and microwave devices are presented. [A3168]

"Cruise controller for vehicles"

In a vehicle which sets a target vehicle-interval distance, and can execute auto-cruise control for controlling the vehicle speed so as to maintain the target vehicle-interval distance, when the auto-cruise control is not executed, a vehicle-interval distance to be set by a driver is detected together with the vehicle speed at that time. A plurality of sets of the vehicle speed and vehicle-interval distance data are accumulated, and the relationship between the vehicle speed and the vehicle-interval distance is calculated. Upon execution of the auto-cruise control, a vehicle-interval distance corresponding to the vehicle speed at that time is obtained from the calculated relationship, and the obtained vehicle-interval distance is set to be the target vehicle-interval distance. [A3169]

"Processing method using an advanced radar waveform for simultaneous matched processing and range profiling of different size targets"

A method of processing radar returns derived from a new radar waveform. The method processes radar returns derived from transmitting the radar waveform to provide simultaneous matched processing and range profiling of different size objects in the presence of clutter. In the present method, radar returns are digitized and processed to produce pulse compressed radar returns having a predetermined (169: 1) pulse compression ratio. A pulse to pulse fast Fourier transform on each RF step is performed on the pulse compressed radar returns. The Fourier transformed radar returns are then simultaneously processed by three processing channels, one each for ships, boats and submarines to provide detection of the different size objects. The waveform permits concurrent detection, discrimination, and high resolution range imaging of detected objects within a single dwell, using a single waveform. Thus, a radar search mode using the waveform integrates several search functions without increasing search frame time. [A3170]

"Moving target identifying system in a base station radar unit for specifying information about moving targets carrying a mobile station radar unit"

A vehicle ID radar system has a simple construction and obtains high identifying performance by making a general identification based on a plurality of responses. There are provided an antenna for obtaining a plurality of question signals from a base station radar unit, a receiver for processing the signals received from the antenna, a question code demodulator for demodulating question codes from the received signals, a question code decoder for decoding the question codes and reading responses respectively corresponding to the plurality of questions from a plurality of data bases, a response code generator for generating response signals, and a transmitter for modulating the response signals and supplying them to the antenna. [A3171]

"Collision probability detection system"

An accident alarm system continuously assesses the potential for a collision between a host vehicle and an object, based solely on input signals representative of the host vehicle velocity and the distance to the object measured at intervals at time t, by first assessing the status of the host vehicle to determine whether it is moving with constant velocity, stationary, accelerating, or decelerating, and then carrying out different signal processing routines to determine, as necessary, whether the object is moving with constant velocity, stationary, accelerating, or decelerating, the magnitude of the host vehicle and object accelerations, and the direction of movement of the object. Warning signals are generated based on these determinations, which assume that the vehicle and object will continue to possess the same acceleration or deceleration until a collision occurs. The system can also be used to activate additional safety devices by performing additional determinations as to whether a severe collision is imminent. [A3172]

"Warning system for vehicles"

A warning system for a vehicle has a warning device for issuing a warning when the vehicle approaches an object. A warning timing parameter section detects a driving operation by the driver of the vehicle, and calculates a reaction time from the time a warning is issued by the warning device to the time the driver starts the driving operation in response to the warning. A warning control section controls the timing at which the warning should be issued by the warning device, based on the calculated reaction time. [A3173]

"Wind profiling radar"

Clutter present in radar return signals as used for wind profiling is substantially removed by carrying out a Daubechies wavelet transformation on a time series of radar return signals. The smoothly varying nature of the return from clutter provides a relatively small number of high amplitude components in the wavelet transformation, which are truncated to remove the clutter. Inverse transformation yields a time series having had a significant amount of clutter removed, without distortion of the radar return from turbulence, which can then be processed to provide useful wind profile data. [A3174]

"Compatible interactive TV and multimedia delivery system two-way cable TV conversion system for data transmission over a dedicated frequency band"

A bidirectional cable television system provides for transmission of signals from cable subscribers downlink in the same direction as the ensemble of television channels which the cable television system is already constructed to deliver. The subscriber signals may be transmitted over the cable in the blanking intervals of a cable television channel, using the T-NET technique described in U.S. Pat. No. 4,750,036. Alternatively, the signals may be carried over a dedicated channel, or transmitted cochannel along a cable television channel carrying ordinary programming by adding the subscriber information to alternating video frames in alternating polarity to achieve visual cancellation. The subscriber signals are collected after the last distribution line amplifier in the cable downlink. The collected signals are transmitted to a central receiver via wireless or other customary means such as a modem. The collected signals may alternatively be transmitted over the air to the central receiver in the blanking intervals of a broadcast television channel using the T-NET technique. [A3175]

"Resonant tag and method of manufacturing the same"

A resonant tag is manufactured in the manner described below: a conductive thin film is formed to a predetermined thickness on two surfaces of an insulating thin film. Thereafter, a conductive pattern, composed of an inductor element and a capacitor element corresponding to a resonant frequency of a resonant circuit, is printed on a surface of one of the conductive thin films, and a conductive pattern, composed of a capacitor element corresponding to the resonant frequency of the resonant circuit, is printed on a surface of the other insulating thin film at a position which faces the capacitor element formed on one of the conductive thin films using an ink which resists etching. A non-printed portion of the conductive thin films is removed by etching to form a resonant circuit pattern. Thereafter, a portion of the insulating thin film, which corresponds to the capacitor element pattern, is thinned to a desired thickness by pressing a heating/pressing member heated to a predetermined temperature against that portion under a predetermined pressure for a predetermined period of time. [A3176]

"Apparatus for defeating radar speed detection signals"

Acquisition and interpretation of reflections from a target in response to a Doppler radar probe signal from a seeker are inhibited by providing at the target a receiver, preferably a high-speed sweeping transceiver, which is operative to injection lock quickly to the probe signal and thereafter to repeat a low-power replica of the probe signal with frequency modulation of the carrier from the repeater with a deviation greater than the locking bandwidth of the local oscillator to generate a random aperiodic signal. The vehicle operator is notified of the presence of seeker signals to prompt the operator to verify compliance with vehicle operating regulations. The carrier frequency modulation is selected to be of a frequency and deviation sufficient to confuse phase locking and limiting circuitry in a seeker receiver and thereby to inhibit acquisition of an echo from the target. [A3177]

"Apparatus and method for imaging with wavefields using inverse scattering techniques"

An apparatus and method for rapid real time imaging with wavefield energy by inverse scattering using a C.P.U programmed to process data derived from wavefield energy that has been transmitted and scattered by an object so as to reconstruct a wavefield image of the object. Electronic signals are propagated and are transduced into wavefield energy waves which in turn are propagated toward the object. Detector means detect the wavefield energy waves scattered by the object. The detected wavefield energy waves are then electronically processed and input into a high-speed digital computer which may comprise a C.P.U. and/or a C.P.U in combination with an array or parallel processor. Data is also prepared and input to the computer representing the incident field and the computer then reconstructs a high-quality image of the object having high spacial resolution and including actual internal viscous and elastic properties of the object through the use of new inverse scattering techniques used in the data processing steps. The media in which the object is embedded may be fluid or solid, homogeneous, or layered (such as stratigraphic layering, or ocean velocity layers, or layering of composites in nondestructive imaging applications) , or may consist of porous material (either sedimentary deposits or composites in nondestructive testing) . [A3178]

"Spread spectrum CDMA communications system"

A spread spectrum CDMA communications system for communicating data and/or digitized voice between a plurality of users to a plurality of PCN units. The spread spectrum communications system is located within a same geographical region as occupied by an existing FDMA, proposed TDMA or any other mobile cellular system. The spread spectrum CDMA communications system includes a plurality of PCN-base stations and a plurality of PCN units. A PCN-base station has a comb filter for notch filtering predetermined channels of the mobile cellular system, a device for converting the format of the data into a form suitable for communicating over radio waves, a spread spectrum modulator for spread spectrum processing the data, and a transmitter for transmitting the spread spectrum processed converted data from the PCN-base station to a PCN unit. The PCN-base station also has an antenna, and spread spectrum detectors for recovering data communicated from the PCN units. A PCN unit has an antenna, and a detector coupled to the antenna for recovering data communicated from the PCN-base station. The detector includes a spread spectrum demodulator. Also, the PCN unit has a device for converting the format of the data into a form suitable for communicating over radio waves, a spread spectrum modulator and a transmitter. [A3179]

"Method and device for maneuvering a motor vehicle out of a parking space"

A method and a device for maneuvering a motor vehicle out of a parking space, in the case of which neither the size nor the clearance of obstacles is known. By means of sensors mounted on the motor vehicle, the clearance between the motor vehicle and surrounding obstacles and the position and steering angle of the motor vehicle are determined, and continuously updated. On the basis of this data, an up-to-date, local map of the surroundings is placed in a computer module. A polyline is used to connect the detected obstacles to form a barrier. From this data, a model of the surroundings is produced, with which a driving strategy for maneuvering the motor vehicle out of the parking space is determined. Driving-direction pointers indicate the appropriate driving direction to the driver of the motor vehicle. [A3180]

"System and method for tracking objects using a detection system"

A system and method of tracking objects first receives returns from objects in the field of view of a detector. The sensor generates a current frame of datapoints, where an object in the field of view can be represented by multiple datapoints. The datapoints are converted into global coordinates and mapped into a next frame of datapoints and generated at a next sample time to cream a new current frame of datapoints. This new current frame of datapoints is processed to form a list of objects with location and power information that includes information from one or more previous frames. This mapping and processing to form the list of objects allows the system to detect weak signal targets in a ground cluttered environment and minimizes the occurrence of false alarms. [A3181]

"Distance measurement device and vehicle velocity control device for maintaining inter-vehicular distance"

The computer (CPU) of a distance measurement device determines the inter-vehicular distance by applying a software filter (weighing means) upon successive values obtained directly from measurement. A vehicle velocity control device for maintaining the inter-vehicular distance include a distance measurement device for measuring the inter-vehicular distance, and the deviation .DELTA.R of the inter-vehicular distance with respect to the target inter-vehicle distance R.sub.S is determined. The vehicle velocity is controlled on the basis of the deviation .DELTA.R in accordance with the PID (proportion plus integral plus differential) control method, and the gains are varied in accordance with the current value of the inter-vehicular distance. [A3182]

"Transponder having microprocessor generated frequency shift signals"

An improved transponder for use in identifying an controlling vehicles wherein transponders mounted on vehicles respond to signals from a fixed location interrogator providing information relative to the vehicle or other data as required. The transponder disclosed in particular utilizes an improved method of providing frequency shift keyed (FSK) signals in response to a trigger or command signal received from a ground mounted loop or antenna. As disclosed, the transponder of the invention generates FSK signals through programming multiple microprocessor loops of predetermined duration, each loop providing microprocessor highs and lows for transmission to the interrogating station. Utilization of the inherently accurate microprocessor cycle time to generate distinct FSK signals avoids problems with ordinarily used analog frequency generating devices. [A3183]

"Microwave doppler radar system for detection and kinematic measurements of river ice"

The present invention pertains to a microwave continuous wave (CW) Doppler adar system for river ice motion detection and real-time kinematic data acquisition using digital signal processing equipment for processing, storing and displaying such data. With less complex electronic signal processing hardware, a Doppler radar ice motion detection and alarming system can be used in conjunction with the system. River ice kinematic measurements are fundamental to analyses of river/ice dynamics. The system herein can be rapidly deployed, requires minimal operator interaction, and can continuously acquire, process, store and display ice kinematic data regardless of visibility conditions. Use of the Doppler radar system is an effective, efficient and precise method and apparatus for obtaining river ice kinematic data. [A3184]

"3-D weather display and weathercast system"

A weathercasting system for displaying dynamic real time photo-realistic three-dimensional pictorial representations of weather conditions created from meteorological data combined with geographical and topographical data. Geographical and topographical data is retrieved, digitized, and processed to produce a simulated three-dimensional volumetric image and stored in memory for later retrieval. Meteorological data including precipitation, cloud cover data, the bottom and top of cloud formations, and reflectivity and velocity of rain droplets in real-time are acquired from C-band and/or K-band Doppler radar, or non-Doppler K-band and Doppler X-band radar installations which ameliorate S-band radar data and the data is digitized and processed to produce a simulated three-dimensional image of the meteorological data. The meteorological data is combined with the geographical and topographical data to produce a digital signal capable of being transmitted to a computer, displayed on a computer display screen, and manipulated by peripheral devices connected with the computer. The combined data is displayed as a photo-realistic three-dimensional pictorial representation of weather conditions from a selective observation point and relative to a selective geographical area. The pictorial representation can be manipulated to give the visual effect of moving through a weather system to allow the viewer to visualize the effects of the weather system at various geographical locations. [A3185]

"Vehicle speed sensor utilizing relationship between vehicle wheel speed and doppler-effect speed"

The apparatus has a signal processor for determining the ground speed of a motor vehicle on the basis of the frequency of a wave transmitted from a transmitter and the frequency of the wave reflected by the ground surface and received by a receiver. The signal processor includes a relationship obtaining device for obtaining a relationship between an estimated vehicle speed obtained on the basis of the speed of a vehicle wheel, and a provisional speed determined on the basis of the frequencies of the transmitted and reflected waves, when the vehicle is in a steady running state in which the estimated vehicle speed accurately represents the actual vehicle speed. The signal processor determines the final vehicle speed on the basis of the obtained relationship. [A3186]

"Passive identification of friend vs. foe apparatus and method"

A method and apparatus for passive identification includes a series of elements preferably in the form of strips, bars or other geometric shapes, or as dipole antennas made of a material having variable EM retro-reflectivity characteristics. By varying the characteristics of individual elements (i.e. spatial, polarization, frequency response and angular extent of retro-reflection) , the elements form an alterable pattern which can be used for identification. The characteristics can be changed remotely, the ability of the device to understand and implement the change being a criterion for identification. [A3187]

"Contact management model assessment system for contact tracking in the presence of model uncertainty and noise"

A system for providing an iterative method of assessing accuracy of selected models of physical phenomena and for determining selection of alternate models in response to a data sequence in the presence of noise. Initially, a residual sequence is generated reflecting difference values between in response to said data sequence and an expected data sequence as would be represented by a selected model. Feature estimate values of a plurality of predetermined data features in the residual sequence are then generated. In response to the feature estimate values, a threshold value is generated for each feature at an estimated ratio of data to noise power. Probability values are generated in response to the threshold value, representing the likelihood that the feature exists in the data sequence, does not exist in the data sequence, and that the existence or non-existence in the data sequence is not determinable, along with an amplitude probability value indicating the belief of the amplitude of the respective feature in the data sequence. Probability values are generated in response to the feature existence and amplitude probability values, representing the likelihood that various modelling hypotheses are represented by the observed features, or are not ruled out by the observed features in the presence of the given noise level. Finally, a model is selected in response to the probability values for use during a subsequent iteration. [A3188]

"Recording of operational events in an automotive vehicle"

An apparatus and method for recording operational events in an automotive radar system. The invention provides an Event Recording Apparatus (ERA) that records selectable vehicle performance, operational status, and/or environment information, including information useful for accident analysis and updated software for use by a system processor capable of reading data from the ERA. The preferred embodiment of the ERA comprises a non-volatile solid-state memory card, a memory card adapter located in a vehicle, and a microprocessor, either as part of the memory card or embedded in a system within the vehicle, for controlling the storage of data within the memory card. The ERA is configured to store such vehicle information as the closing rate between the recording vehicle and targets located by the vehicle's radar system, distance between the recording vehicle and targets, vehicle speed, and such vehicle operational status and environment information as braking pressure, vehicle acceleration or deceleration, rate of turning, steering angle, hazard levels determined from a radar system processor, target direction, cruise control status, vehicle engine RPM, brake temperature, brake line hydraulic pressure, windshield wiper status, fog light status, defroster status, and geographic positioning information. In addition, the ERA can be configured to function as a common trip monitor, recording distance travelled, average speed, miles-per-gallon, fuel remaining, compass direction of travel, etc. The device can also record vehicle maintenance information, such as oil temperature, engine temperature, transmission fluid temperature, and engine timing. [A3189]

"Radio frequency automatic identification system"

A radio frequency automatic identification system detects targets which include a plurality of radio frequency resonators. Information is attributed to the target in accordance with the radio frequency response characteristics of the target, such as the resonant frequencies of resonators present, and/or the spatial locations within the target of the resonators. Preferred resonators include thin dipoles, which may be metallizations on a plastic film substrate. Information may be attributed to a target by fabricating the target with resonators disposed at locations to encode information in accordance with a predetermined encoding system, alternatively, resonators may be randomly disposed, and a translation code applied to convert the radio frequency information to particular information in a particular format. Readers for use in the system read the radio frequency response characteristics of a target in the near field of a radiating aperture which is illuminated by a radio frequency source. Items which may be encoded with radio frequency readable information include documents, credit cards, and computer diskettes. [A3190]

"Speed detecting apparatus"

A speed detecting apparatus mounted on an object moving on the ground detects a Doppler frequency for computing a moving speed thereof by receiving reflection waves of a microwave signal or a millimeter wave transmitted to the ground. The apparatus comprises a plurality of transmitting/receiving systems each having an antenna and a transmitter/receiver, and a signal processing section for computing moving speed according to Doppler frequency detected by the transmitting/receiving systems. Directivity of an antenna provided in each of the plurality of transmitting/receiving systems is set at a different angle respectively. [A3191]

"Intelligent area monitoring system"

An intelligent area monitoring system having a field sensor, a neural network computer, and a communications apparatus is disclosed. The system has the capability of detecting and monitoring the location and identity of people, animals, and objects within an indoor or outdoor area for the purpose of intrusion detection, theft deterrence, and accident prevention. The neural network computer accepts the input signals from the field sensor and forms a virtual model of the monitored area from the input. Any changes that occur within the monitored area are communicated to system users. The sensors can be active or passive, analog or binary, and the system is optimally configured with a mix of different sensor types such as vibration, sound, infrared, optical, microwave, and ultrasonic. Each analog sensor provides an analog output which varies in proportion to the size and distance of its target. After monitoring changes in the space being monitored and identifying various objects within the space, the neural network computer communicates such information to the user. [A3192]

"Narrow field electromagnetic sensor system and method"

A narrow field electromagnetic sensor system and method of sensing a characteristic of an object provide the capability to realize a characteristic of an object such as density, thickness, or presence, for any desired coordinate position on the object. One application is imaging. The sensor can also be used as an obstruction detector or an electronic trip wire with a narrow field without the disadvantages of impaired performance when exposed to dirt, snow, rain, or sunlight. The sensor employs a transmitter for transmitting a sequence of electromagnetic signals in response to a transmit timing signal, a receiver for sampling only the initial direct RF path of the electromagnetic signal while excluding all other electromagnetic signals in response to a receive timing signal, and a signal processor for processing the sampled direct RF path electromagnetic signal and providing an indication of the characteristic of an object. Usually, the electromagnetic signal is a short RF burst and the obstruction must provide a substantially complete eclipse of the direct RF path. By employing time-of-flight techniques, a timing circuit controls the receiver to sample only the initial direct RF path of the electromagnetic signal while not sampling indirect path electromagnetic signals. The sensor system also incorporates circuitry for ultra-wideband spread spectrum operation that reduces interference to and from other RF services while allowing co-location of multiple electronic sensors without the need for frequency assignments. [A3193]

"Automatic brake control system"

An automatic brake control system produces a warning before automatically making the braking action of a driving vehicle according to the velocities of the driving vehicle and the vehicle ahead. The system calculates the desired vehicle distance according to the velocities of the driving vehicle and the vehicle ahead, and sets a warning distance which is longer than the desired vehicle distance. The warning distance is set in accordance with the driver's feeling. According to the present invention, the system is prevented from producing undesirable warning. [A3194]

"Obstacle recognition system for a vehicle"

A radar device emits a wave beam into a given angular range outside a vehicle, and scans the given angular range by the wave beam. The radar device detects a reflected wave beam. A recognizing device is operative for recognizing an obstacle with respect to the vehicle on the basis of the result of detection of the reflected wave beam by the radar device. In the recognizing device, a point recognizing section recognizes obstacles as points, and a uniting section is operative for uniting adjacent points among the points provided by the point recognizing section. The uniting section provides sets each having adjacent points. A line-segment recognizing section is operative for detecting a specific set or specific sets of adjacent points among the adjacent-point sets provided by the uniting section, and for recognizing every detected specific set as a line segment having a length only along a width direction of the vehicle. Every specific set has a length smaller than a given length along a longitudinal direction of the vehicle. A position estimating section estimates the position of a line segment, which will be provided by the line-segment recognizing section, in response to the position of a previously-provided line segment. An identity judging section is operative for comparing the line-segment position estimated by the position estimating section and the position of a line segment currently provided by the line-segment recognizing section to judge whether or not the line segment currently provided by the line-segment recognizing section and the previously-provided line segment are the same. [A3195]

"Proximity detonator"

A proximity detonator which derives its firing criterion from reflected beam measurements and thus obtains information about the radial relative velocity of the detonator with respect to its target object by evaluating the Doppler effect, wherein the firing signal is produced by a circuit including a function generator whose output voltage has a time sequence which corresponds to the decrease in radial relative velocity as the detonator approaches its target object (possibly under consideration of a correction value resulting from the firing law) , a voltage controlled oscillator whose control input is connected to the output of the function generator, and a phase comparator having two signal inputs, one of which receives a Doppler signal which corresponds to the radial relative velocity and the other of which is connected to the output of the oscillator. The phase comparator compares the two input signals and emits the firing signal whenever the frequency of the Doppler signal is equal to the comparison frequency from the oscillator. [A3196]

"Body monitoring and imaging apparatus and method"

A non-acoustic pulse-echo radar monitor is employed in the repetitive mode, whereby a large number of reflected pulses are averaged to produce a voltage that modulates an audio oscillator to produce a tone that corresponds to the heart motion. The antenna used in this monitor generally comprises two flat copper foils, thus permitting the antenna to be housed in a substantially flat housing. The monitor converts the detected voltage to an audible signal with both amplitude modulation and Doppler effect. It further uses a dual time constant to reduce the effect of gross sensor-to-surface movement. The monitor detects the movement of one or more internal body parts, such as the heart, lungs, arteries, and vocal chords, and includes a pulse generator for simultaneously inputting a sequence of pulses to a transmit path and a gating path. The pulses transmitted along the transmit path drive an impulse generator and provide corresponding transmit pulses that are applied to a transmit antenna. The gating path includes a range delay generator which generates timed gating pulses. The timed gating pulses cause the receive path to selectively conduct pulses reflected from the body parts and received by a receive antenna. The monitor output potential can be separated into a cardiac output indicative of the physical movement of the heart, and a pulmonary output indicative of the physical movement of the lung. [A3197]

"Automatic vehicle following system"

An automatic vehicle following system is provided for controlling a following vehicle to maintain at least a predetermined distance behind a preceding vehicle and to substantially follow the path of the preceding vehicle. An on-line measurement system of the preceding vehicle generates signals indicative of the velocity (having speed and directional components) of the preceding vehicle, and a communication system transmits the velocity signals to the following vehicle. The following vehicle likewise has a communication system for receiving the signals from the preceding vehicle, and an on-line measurement system for providing signals indicative of the velocity of the following vehicle and signals indicative of the distance between the two vehicles. A signal processing system of the following vehicle is coupled to the communication system and on-line measurement system for estimating motion trajectory of the preceding vehicle based on the difference in the velocities of the preceding and following vehicles and the following distance. A control system generates control signals and takes action so as to perform speed control and maintain at least a predetermined safe following distance between the two vehicles, and steering control to substantially follow the path of the preceding vehicle. [A3198]

"Anti-collision system for vehicles"

An anti-collision system detects conditions of an object preceding a source vehicle, and parameters indicative of operating conditions of the source vehicle, and controls the source vehicle so as to prevent a collision with the object, based on the detected conditions of the object and the detected operating conditions of the source vehicle. The system estimates a path of travel of the source vehicle, based on the detected parameters, and sets an area of travel of the source vehicle to a first predetermined area lying about the estimated path of travel. Further, the system estimates a path of movement of the object, based on the detected conditions of the object, and sets an area of movement of the object to a second predetermined area lying the estimated path of movement. The system calculates a possibility of collision, based on the set area of travel and area of movement, to thereby control the velocity of the source vehicle. [A3199]

"Police traffic radar using absolute signal strength information to improve target signal processing accuracy"

A police radar utilizing digital data transmission from the antenna unit to a separately housed counting and display unit. The antenna has a double balanced mixer to suppress even order harmonics. The counting and display unit has a computer programmed to perform digital signal processing on the digital data received from the antenna to improve the quality and accuracy of calculated speeds for patrol speed, strongest target speed and fastest target speed. Fastest target speed can be displayed simultaneously with strongest target speed. Signal processing techniques are used to suppress false signals caused by double and triple bounce, harmonics, intermodulation products, video display terminal interference, etc. [A3200]

"Statistical averaging method for wind profiler doppler spectra"

This method for Doppler spectral processing more readily identifies the profiler radar return signals from the atmosphere in the presence of contamination, e.g., from bird echoes, ground clutter, and radio frequency interference. Profiler radars measure winds in the atmosphere by using backscatter (i) from refractive index fluctuations in clear air due to turbulence or (ii) from precipitation such as rain or snow. These radars also receive contaminating radar returns from ground clutter (e.g., from vehicles, power lines, and trees) and from fliers (e.g., aircraft, insects, and birds) . In general, the radar return signals from the atmosphere have statistical and physical properties different from those properties for the contaminating radar returns. This new method uses these differences to eliminate or reduce contamination in radar Doppler spectra for estimation of atmospheric winds. [A3201]

"Method and apparatus for hybrid analog-digital pulse compression"

A method and apparatus for hybrid analog-digital pulse compression, as well as, a method of use and manufacture includes an analog intermediate frequency filter, a converter, and a digital correlator. The analog intermediate frequency filter filters and weights returned echo signals, and the digital correlator compresses the filtered and weighted echo signals. The frequency or impulse response of the digital correlator is set based on the frequency or impulse response of the analog intermediate frequency filter to obtain a pulse compressor with minimal mismatch loss and improved sidelobe suppression. The invention provides for the lowest possible sampling rate of analog-to-digital convertors used with the apparatus, thus, minimizing the cost of this device and all subsequent digital processing. [A3202]

"Police traffic radar for allowing manual rejection of incorrect patrol speed display"

A police radar utilizing digital data transmission from the antenna unit to a separately housed counting and display unit. The antenna has a double balanced mixer to suppress even order harmonics. The counting and display unit has a computer programmed to perform digital signal processing on the digital data received from the antenna to improve the quality and accuracy of calculated speeds for patrol speed, strongest target speed and fastest target speed. Fastest target speed can be displayed simultaneously with strongest target speed. Signal processing techniques are used to suppress false signals caused by double and triple bounce, harmonics, ntermodulation products, video display terminal interference, etc. [A3203]

"Doppler microwave sensor"

A Doppler microwave sensor for a vehicle alarm employs a mixer stage and a signal-processing stage on a printed circuit board, the printed circuit board having a ground plane containing a slot antenna which is coupled to the mixer stage. The ground plane is electrically connected to an electrically conductive enclosure which is disposed behind the slot antenna and encloses the component parts of the mixer and signal-processing stages. A dielectric lens may be placed over the slot antenna to provide a transmission beam pattern which is configured to the vehicle in which the sensor is to be used. In a preferred embodiment, the mixer stage is based arounda self-oscillating mixer arrangement in which the active element is a bipolar transistor and a single antenna is employed both to transmit the oscillator signal and to receive the Doppler-shifted return signal. [A3204]

"Weather radar using spectral gaussian envelope discrimination for clutter rejection"

A method for removing clutter related frequency components from power spectrums generated from weather radar return signals to provide improved windshear detection capability. Weather radar return signals are synchronously detected and digitized to provide i and q time domain sample sequences. The i and q time domain sample sequences are passed through a window function and then transformed to frequency domain sequences by a Fast Fourier Transform. A power spectrum is generated from the frequency domain sequences. The spectrum is subjected to a Spectral Gaussian Envelope Discrimination (SGED) process in which the spectral envelope is scanned to identify any lobe therein having a slope greater than a predetermined minimum. A first pseudo-Gaussian sigma, calculated from the width and maximum amplitude of any such lobe, is compared with a second pseudo-Gaussian sigma, calculated from known conditions. If the first sigma is less than the second sigma, the lobe is deemed to be clutter related and is edited from the spectral envelope. [A3205]

"Police traffic radar using digital data transfer between antenna and counting unit"

A police radar utilizing digital data transmission from the antenna unit to a separately housed counting and display unit. The antenna has a double balanced mixer to suppress even order harmonics. The counting and display unit has a computer programmed to perform digital signal processing on the digital data received from the antenna to improve the quality and accuracy of calculated speeds for patrol speed, strongest target speed and fastest target speed. Fastest target speed can be displayed simultaneously with strongest target speed. Signal processing techniques are used to suppress false signals caused by double and triple bounce, harmonics, intermodulation products, video display terminal interference, etc. [A3206]

"Radar system"

In an FMCW radar system, the velocity of obstacles relative to the radar couples a Doppler frequency shift into the return signal which causes an error in the range measurement. It is known to use a radar signal having a frequency ramp that both increases and decreases to distinguish the range of an obstacle from its velocity but when multiple obstacles are present this is not practical. By using a measure of velocity from a succesion of return signals, which of the radar output signals from the upsweep and downsweep of the radar signal that relate to a particular obstacle can be identified so that the range and velocity can be determined accurately. The FMCW radar system may be provided with a frequency scanned antenna, the beamwidth determined by the processing circuitry is variable according to the size of the obstacle being detected or the range at which the radar is searching for obstacles. Instead of scanning the beam of the radar, the variation in frequency can be made to alter the beamwidth of the radar so that, for example, a car radar will detect only vehicles in the lane ahead of the car, regardless of the range of the vehicles. [A3207]

"Low target velocity interferometric AMTI radar"

An AMTI radar employs a dual cancellation format to cancel the clutter in the radar returns received by the apertures of an interferometric radar antenna. The three-aperture antenna presents the radar returns to three receivers which demodulate the returns to a complex in-phase signal I and a quadrature signal Q which are sampled at a pulse repetition interval at all ranges of interest. After conventional motion compensation four data sets are derived from the returns of the three apertures, L (t) , C (t-.tau.) , C (t) and R (T-.tau.) which represents samples taken over multiple pulse repetition intervals for each range interval or bin of interest. The data is processed by both adjacent array processing and outer array processing, the latter only requiring a minimal amount of additional capacity. Compensation phase is further adjusted in a clutter/clutter-free phase calculator allowing a much reduced phase quantity to be applied to the delayed data sets as the second part of the dual cancellation signal. Following subtraction of doppler filter outputs of the delayed data sets from the undelayed data sets in the cancellation/enhancement unit, maximum clutter cancellation is achieved in the clutter region and optimal moving target response is obtained in the clutter-free region. The two-range maps that result after subtraction of the doppler filter outputs are presented to a detection and validation processor to determine range, doppler, amplitude and angle measurements to the moving targets with a high degree of accuracy. [A3208]

"Height finding antenna apparatus and method of operation"

A ground based radar antenna system and method for determining the elevation angle .phi. of a tracked target having a shaped reflector and a pair of spaced feedhorns for transmitting radiated energy to and receiving returned signals from the tracked target T, the shaped reflector and feedhorns cooperating to increase the range of coverage of the elevation angle .phi. beyond the coverage previously available with a standard parabolic reflector and to increase the gain of the signals returned to the ground based radar antenna system while simultaneously eliminating elevation angle ambiguities over prior systems employing only feedhorns for collecting returned signals. The radar system includes a construction which approximates a cosecant-squared antenna pattern, permits the calculation of the target height and three-dimensional position, and is economical to manufacture. [A3209]

"Device for measuring the velocity of vehicles for traffic monitoring"

A device for measuring the velocity of vehicles for traffic monitoring a doppler signal transmitter and receiver is used which comprises two mixer diodes arranged to deliver two doppler signals which are dephased against each other by 90.degree., the one or the other signal leading the other, depending on whether the picked up vehicle approaches or recedes from the doppler signal transmitter is fed into a frequency measuring device for measuring the signal frequency as a quantitative measure for the relative velocity between vehicle and doppler signal transmitter. for this purpose one signal of the doppler signal transmitter and receiver 10 is fed into a phase control circuit 34, the output frequency of which is converted into a voltage proportional to the relative velocity between doppler signal transmitter 10 and monitored vehicle. Furthermore, the two signals of the doppler signal transmitter and receiver are fed into a phase detector 26. The output signals of the phase detector circuit 26 are fed into a directional logic circuit 28 which has two logic outputs 30, 32 at which logic signals appear indicating as to whether the picked up vehicle approaches or recedes. The logic signals from the directional logic circuit 28 are fed into a frequency voltage converter 56. The frequency voltage converter 56 has two outputs 62, 64. A voltage proportional to the relative velocity of the picked up vehicle appears at output 62 when the picked up vehicle approaches. A voltage proportional the the relative velocity of the picked up vehicle appears at output 64 when the picked up vehicle deviates. [A3210]

"Method for locating leakage of substances from subterranean structures"

A method for imaging substances leaking from underground structures using continuous-wave signals includes translating an antenna array over the ground, transmitting a continuous-wave signal into the ground at an array of points, detecting the amplitude and phase of the reflected signal at each point, transforming the reflectance values into the frequency domain, propagating this reflectance spectrum to a predetermined depth, and transforming the propagated spectrum into an image in the spatial domain at that depth. An image representing the underground structure containing the substance may be overlayed on the calculated image to detect differences that represent leakage. Successive images of the same area may be produced over a period of time and the differences compared to determine the rate of leakage. [A3211]

"Surface wave guideline and object detecting device using surface wave guideline"

An electromagnetic surface wave guideline that is formed by intertwisting dielectrics while providing a periodic structure like a rope and arranging conductors in a period harmonizing with the structure, and is suitable for such a use that entry of various objects including human beings and animals into a specific area for instance, and an object detecting device using the guideline [A3212]

"Excavator data acquisition and control system and method of use"

An excavator data acquisition and control system and process for characterizing the subsurface geology of an excavation site, and for utilizing the acquired data to optimize the production performance of an excavator. A geologic imaging system and a geographic positioning system are employed to initially survey a predetermined excavation site or route. A geologic characterization unit may also be employed to enhance the geologic imaging data. The acquired data are processed to provide detailed geologic and position data for the excavation site and utilized by a main control unit to optimize excavator production performance. In one embodiment, the main control unit accesses a geologic filter database, which includes geologic profile data for numerous types of geology, when analyzing unknown subsurface geology. Removing geological filter data content corresponding to known geology from the acquired geologic imaging data provides for immediate recognition of unknown and suspect subsurface objects. The geologic imaging system preferably includes a ground penetrating radar system having a plurality of antennas oriented in an orthogonal relationship to provide three-dimensional imaging of subsurface geology. Correlation software is employed to correlate acquired geologic image data to historical excavator production performance data to characterize the structural mechanics of subsurface geology. Accurate geographic mapping of an excavation site is provided by the geographic positioning system which preferably includes a mobile transponder mounted to an excavator and a plurality of ground-based transponders and, in one embodiment, Global Positioning System (GPS) signals. [A3213]

"Device for wireless transfer of information"

A device for wireless transfer of information includes a data carrier in the form of a thin card, and a transponder that receives a first microwave signal, modulates it and codes it with data, and reradiates a second microwave signal without adding new energy thereto. The transponder includes at least one antenna device formed using microstrip conductors. The antenna device includes a patch antenna with an antenna layer that acts against a ground plane where the antenna layer and the ground plane are of substantially equal size. The device is characterized in that, it is equipped with a separate card holder with a reflective surface that is larger than said ground plane. The reflective surface increases the range by reradiating the second microwave signal and reducing sensitivity to back lobe reflections. [A3214]

"Two-way cable tv conversion system"

A bidirectional cable television system provides for transmission of signals from cable subscribers downlink in the same direction as the ensemble of television channels which the cable television system is already constructed to deliver. The subscriber signals may be transmitted over the cable in the blanking intervals of a cable television channel, using the T-NET technique described in U.S. Pat. No. 4,750,036. Alternatively, the signals may be carried over a dedicated channel, or transmitted cochannel along a cable television channel carrying ordinary programming by adding the subscriber information to alternating video frames in alternating polarity to achieve visual cancellation. The subscriber signals are collected after the last distribution line amplifier in the cable downlink. The collected signals are transmitted to a central receiver via wireless or other customary means such as a modem. The collected signals may alternatively be transmitted over the air to the central receiver in the blanking intervals of a broadcast television channel using the T-NET technique. [A3215]

"Apparatus and method for measuring mass flow rate of a moving medium"

A mass flow meter is provided for measuring the mass flow rate of a material moving along a flow path. The mass flow meter generates a field of electromagnetic energy through which a material moving along the flow path passes. The mass flow meter includes a receiver that detects an amount of electromagnetic energy reflected from the material which is proportional to the concentration of material moving along the flow path. The amount of electromagnetic energy reflected and an assumed velocity are used to generate a response related to the mass flow rate of the material moving along the flow path. [A3216]

"Optical monopulse chirp processor"

An optical chirp processor for the collection and processing clutter samples is presented that allows the simultaneous estimation of both the clutter mean and variance. The estimated clutter mean and variance allow the actual calculation of both clutter model parameters using a power spectrum analyzer, and a CFAR special purpose processor unit. The power spectrum analyzer is composed of: a spatial frequency demultiplexor, and a four element photodetector array. The special purpose processor is composed of: an A/D converter, a square root calculator, an averaging calculator, a combiner unit, a parameter memory unit, and a threshold calculator unit. The components of the CFAR processor may be implemented in a conventional CFAR processor (when modified by the teachings of the present invention) or in individual electronics components. [A3217]

"System for determining and registering location of mobile terminal for communication system with non-geosynchronous satellites"

The non-geosynchronous orbiting satellites each transmit identification information given to each of spot beams irradiated from them. A mobile terminal, when registering its location, receives the spot beam identification information at some moments in time with the predetermined time interval. Then, the mobile terminal transmits the received spot beam identification information and each of their reception time together with the terminal identification information assigned to the mobile terminal. On the basis of an overlapped area of spot beam coverage areas at time when each of identification information is received by the terminal, a terrestrial network estimates and registers the latest location of the mobile terminal. [A3218]

"Radar system with adaptive clutter suppression"

A method of spectral estimation of a received radar signal wherein an image of the received radar signal is applied to windows of differing prolate spheroidal sequences to calculate multiple eigenspectra. The value of each of said sequences are multiplied with the radar signal, and the Fourier transforms of the products provide a plurality of realizations of orthogonal eigenspectra. The orthogonal eigenspectra are combined into a minimum variance, low bias estimate of the mean power spectrum and an estimate of a variance of said spectrum for each frequency in the spectrum to provide a more accurate estimate of back ground noise and to further improve detection performance. [A3219]

"Pulse doppler proximity sensor"

A pulse Doppler proximity sensor uses a plurality of stepped output radio signals for accurately determining the relative range between the proximity sensor and an object. A dual modulation technique is employed which incorporates a pulse modulation arrangement and a carrier frequency modulation arrangement to detect the necessary range accurately from the plurality of output radio signals. The proximity sensor processes in parallel each of the plurality of output radio signals returned from the object. A binary comparison is made and the comparison is integrated over time to prevent false alarms. The pulse Doppler proximity sensor is particularly useful in fuzing arrangements for a munition in which a number of range settings are desired. [A3220]

"Neural network based data fusion system for source localization"

A method is described for providing an estimate of the state of a moving contact. The method comprises providing a device for estimating the state of the contact, inputting information about a location of an observer platform at particular time intervals and information from at least one sensor about a position of the moving contact relative to the observer platform at each time interval into the device, transforming the inputted information into a series of geographical grids with one grid being formed for each reading of the at least one sensor, combining grids corresponding to similar time intervals into a series of consolidated grid representations, and analyzing the series of consolidated grid representations to produce an estimate of the state of the contact at a final point in time where an observation was made. The device of the present invention includes a grid stimulation block for forming the geographical grids, a fusion block for forming the consolidated grid representations, a correlation block for providing a path likelihood vector, and an estimation block for providing the desired estimate. [A3221]

"Method and system for tracking multiple regional objects by multi-dimensional relaxation"

A method and system for real-time tracking of objects is disclosed. A region is repeatedly scanned providing a plurality of images or data sets having points corresponding to objects in the region to be tracked. Given a previously determined track for each object in the region, an M-dimensional combinatorial optimization assignment problem is formulated using the points from M-1 of the images or data sets, wherein each point is preferably used in extending at most one track. The M-dimensional problem is subsequently solved for an optimal or near-optimal assignment of the points to the tracks, extending the tracking of the objects so that a response to each object can be initiated by the system in real-time. Speed and accuracy is provided by an iterative Lagrangian Relaxation technique wherein a plurality of constraint dimensions are relaxed simultaneously to yield a reduced dimensional optimization problem whose solution is used to formulate an assignment problem of dimensionality less than M. The iterative reducing of dimensions terminates when exact solutions are determined for two-dimensional cases. A recovery procedure is used for determining a higher dimensional assignment problem solution from a problem having one less dimension. The procedure is useful when the reduced dimensional optimizational problem has two constraint dimensions. [A3222]

"Method for tracking moving objects"

The tracking of moving objects on land, in the air or at sea is effected by means of one or more sensors (S.sub.j.sup.1) . The observation space of each sensor is divided into resolution cells (X.sup.1h) forming a grid. The sensors of the same grid are grouped together. A probability estimate (.beta.k) for a moving object being in a cell (Xk) which is an intersection of the resolution cells (X.sup.1h) is produced. for this purpose, the starting points are signals (M.sub.j.sup.1h) delivered by the sensors (S.sub.j.sup.1) and previously selected according to windowing criteria, sets of pairs (F.sub.i (M.sub.j.sup.1h) D.sub.ij.sup.1h) stored in memories (1) and coming from a prior supervised statistical learning, and tracking coefficients (.alpha.k) delivered by an adaptive tracking filter (4) of the PDAF type. After application of this probability (.beta.k) to the adaptive tracking filter (4) , there is obtained on the one hand an estimated status (X*,P*) affording a trajectory prediction (x,S) for at least one moving object and, on the other hand, the windowing criterion is adjusted. [A3223]

"Apparatus for measuring physical quantity related to relative movement between two objects"

A measuring apparatus is provided in one of two objects moving relatively to each other. The apparatus includes a circuit for effecting a direct spread modulation with respect to a transmission carrier signal using modulation codes, an antenna unit for transmitting the modulated carrier signal toward the other of the two objects and for receiving a reflection wave therefrom, a circuit for demodulating the received reflection wave signal using the transmission carrier signal, a circuit for making correlation between the demodulated output signal and a signal having the same code as that of the modulation code and having a phase delayed by a predetermined time, a unit for extracting a Doppler frequency component contained in a signal which has been propagated through a propagation path existing in a specified distance range, and a circuit for properly processing the extracted Doppler frequency component. By the constitution, it is possible to precisely measure a speed and/or direction angle of one object relative to the other of the two objects, without being subject to an influence by a reflection in the close neighborhood, or an influence by interference of a transmission signal or interference signal in a receiving channel of the apparatus. [A3224]

"Anticollision device, notably for motor vehicles"

In an anticollision device, a moving object heading in a given direction along a movement vector and having a relative speed vector directed towards an obstacle is fitted out with at least two antennas sending out a microwave signal liable to be received by the obstacle. The device furthermore comprises reception means and means to analyze the echoes received from the obstacle, the analyzing means determining the variation with respect to time of the angle .theta. between the movement vector and the relative speed vector, a substantially zero variation of the angle .theta. indicating a risk of collision. Application to the equipment of motor vehicles to prevent collisions, notably in the event of poor visibility. [A3225]

"Arrangement for comparing two temporally separated bursts of signal at two different frequencies"

A comparator circuit compares two temporally separated input bursts of signals which occur at two different frequencies. The first burst is an interrogation pulse and the second burst is a reply pulse in a DME system. The comparator circuit includes a first frequency converter (CO1) for receiving at an input thereof the two input bursts, and a comparing device (DC) connected to receive an output of the first frequency converter (CO1) . In order to reduce the measurement errors, the first frequency converter (CO1) receives at the input thereof the two input bursts and converts them into two new bursts of signals that have a common frequency so that the comparing device (DC) can carry out the comparison at the common frequency. [A3226]

"Non-contact speed measuring apparatus for railroad vehicle"

A speed measuring apparatus includes: a modulation circuit for carrying out a direct spread modulation with respect to a transmission carrier signal using coded two-phase random signals, an antenna unit for transmitting the modulated transmission carrier signal as a radio-wave toward an object and for receiving a reflected wave from the object, a demodulation circuit for demodulating a signal corresponding to the received reflected wave using the transmission carrier signal, to thereby generate intermediate frequency signals, a correlation circuit for making correlation between the intermediate frequency signals and signals each having the same code as that of the coded two-phase random signal and having a phase delayed by a predetermined time, a Doppler detecting unit for extracting from an output signal of the correlation circuit a Doppler frequency component contained in a signal which has been propagated by way of a propagation path existing in a specified distance range, and for generating speed information based on the extracted Doppler frequency component, and a computing unit for computing a movement distance and a position of the railroad vehicle over the whole track, on a real-time basis, using the generated speed information and fixed-point position information input from an outside of the apparatus. By the constitution, it is possible to precisely measure a speed of the railroad vehicle without being subject to the influence by a slip or glide of the wheels under any circumstances. It is also possible to specify a movement distance and position of the vehicle on a real-time basis. [A3227]

"Three-pulse MTI without blind speeds"

An MTI with no blind speeds which compensates for antenna scan modulation. his design includes circuitry for generating and transmitting consecutive first, second and third doppler-tolerant FM pulses, wherein the first and third FM pulses have a given dispersion characteristic, and the second FM pulse has a dispersion characteristic which is the complex conjugate of the first and third FM pulses. Circuitry is then provided for receiving and compressing the first, second, and third echos from the first, second, and third pulses, respectively. Finally, a processing circuit is used to effectively add the first and third echo pulses and to subtract twice the second echo pulse from this sum to effect the detection of the moving target. [A3228]

"Blind-zone target discrimination method and system for road vehicle radar"

A method and system for discriminating a target which presents a hazard to a motor vehicle moving in a first lane of traffic from a target moving in a second adjacent lane of traffic which does not present a hazard to the vehicle. The method includes the steps of utilizing an antenna mounted flush to a side of the vehicle to produce a radar beam having a beamwidth greater than 5-10 degrees to illuminate the target. At least a portion of the radar beam is produced along a first axis which is perpendicular to the direction of motion of the vehicle. The reflected signal is received from the illuminated target and a velocity of the illuminated target is estimated with a Kalman filter relative to the velocity of the vehicle in the direction of a second axis which is parallel to the direction of motion of the vehicle based on the reflected signal. The method also includes the steps of measuring the velocity of the vehicle using at least one velocity sensor and determining that the illuminated target is hazardous if the sum of the measured vehicle velocity and the estimated parallel target velocity is greater than a predetermined threshold. The illuminated target is determined not to be hazardous if the sum of the measured vehicle velocity and the estimated parallel target velocity is less than a predetermined threshold. [A3229]

"Vehicle speed control system"

A vehicle speed control system for controlling the speed of a controlled vehicle to follow a preceding vehicle detected at a constant interval is provided. In this system, when a preceding vehicle traveling ahead of the controlled vehicle is detected, it is checked if the preceding vehicle detected meets a given tracking condition. When the tracking condition is encountered, it is reported to a driver. The system is responsive to a manual operation of the driver after the driver has perceived that the preceding vehicle can be tracked to initiate constant inter-vehicle distance control. [A3230]

"Traffic radar with digital signal processing"

A traffic radar processes Doppler return information by analysis of the received frequency spectrum in order to improve target identification and minimize interference and unwanted harmonics. Digital signal processing including transformation of the return information into the frequency domain is employed to provide multiple modes of operation including a stationary mode where either the strongest or the fastest Doppler return signal may be selectively recognized, and moving modes for monitoring traffic moving in both the opposite direction and the same direction as the patrol vehicle. In the moving modes either strongest or fastest signal processing may be elected, and operation when the patrol and target vehicles are moving in the same direction is provided irrespective of whether the patrol vehicle is moving faster or slower than the target vehicle. The speed of the patrol car is determined by recognizing a signature that exhibits an asymmetry due to the cosine effect. Interference and harmonics are detected and suppressed by recognizing unwanted harmonic patterns and eliminating signal magnitudes at the harmonic frequencies. [A3231]

"Police traffic radar using double balanced mixer for even order harmonic suppression"

A police radar utilizing digital data transmission from the antenna unit to a separately housed counting and display unit. The antenna has a double balanced mixer to suppress even order harmonics. The counting and display unit has a computer programmed to perform digital signal processing on the digital data received from the antenna to improve the quality and accuracy of calculated speeds for patrol speed, strongest target speed and fastest target speed. Fastest target speed can be displayed simultaneously with strongest target speed. Signal processing techniques are used to suppress false signals caused by double and triple bounce, harmonics, intermodulation products, video display terminal interference, etc. [A3232]

"Collision avoidance system for vehicles using digital logic circuitry and retro-fitting techniques"

A continuous exterior perimeter monitoring system for collision avoidance by vehicles with exterior objects is provided utilizing microelectronic digital logic circuits and techniques to produce a visual three-digit numerical display, a discrete multi-color display and a multi-level sound warning system, indicating precise and range of distances of exterior objects from vehicles which could collide therewith within pre-selected distances. The time-to-distance circuits of the system are an integral part of the digital logic circuits that are utilized to ascertain distances and such circuits are in a compact electronic package adapted to and is readily installed and integrated into existing vehicles utilizing the existing wiring electrical power systems primarily as a retro-fitting process for vehicles or as an original installation. [A3233]

"Communication system and method for determining the location of a transponder unit"

A multilaterating two-way message delivery system for mobile resource management provides efficient two-way radio data communication for multitudes of portable transponders using a single frequency in half-duplex communication. The system includes at least one transponder device which transmits and receives data using a radio frequency communication link, and an array of at least three base stations which communicate with the transponder device using the radio frequency communication link. The radio frequency communication link employed by each base station and the transponder device is designed to provide muitilateration information and to deliver message data simultaneously. Further, a control arrangement is coupled to the array of base stations to coordinate the communication between the base stations and the transponder devices. Time-division multiplex and spread spectrum technology is employed by the system for communication efficiency and minimizing the effect of multipath interference. [A3234]

"Police traffic radar for calculating and simultaneously displaying fastest target speed"

A police radar utilizing digital data transmission from the antenna unit to a separately housed counting and display unit. The antenna has a double balanced mixer to suppress even order harmonics. The counting and display unit has a computer programmed to perform digital signal processing on the digital data received from the antenna to improve the quality and accuracy of calculated speeds for patrol speed, strongest target speed and fastest target speed. Fastest target speed can be displayed simultaneously with strongest target speed. Signal processing techniques are used to suppress false signals caused by double and triple bounce, harmonics, intermodulation products, video display terminal interference, etc. [A3235]

"Transponder interface circuit"

A transponder interface circuit (172) operates to allow communication between a transponder controller (104) and external circuitry. The interface circuit (172) has a buffer memory (184,186) that allows the transponder controller (104) and the external circuitry each to transmit data at either the transponder's (14) or the external circuitry's clock rate without complicated protocols for direct communication. Each of the transponder controller (104) and the external circuit may be enabled by an interface controller (174) to assume control of the buffer memory (184,186) . By using the buffer memory (184,186) and interface controller (174) , whichever of the transponder controller (104) and the external circuitry is transmitting or receiving data may fill or empty the buffer memory (184,186) at either the transponder controller's (104) or the external circuitry's chosen clock rate. The interface controller (174) will monitor the transfer such that when the buffer memory (184,186) is full or empty, the interface controller (174) will send a command to the appropriate transponder controller (104) or external circuit to either receive data from the full buffer memory (184,186) or transmit data to the empty buffer memory (184,186) . [A3236]

"Method and system for conserving power in a recognition system"

A system and method for avoiding the discharge of a battery or otherwise excessive power consumption by a transponder (14) in the presence of a spurious noise source. In a described embodiment, the transponder (14) renders itself immune to activation by presence of RF energy for some period if the transponder does not receive a proper wake-up message within an activation period. [A3237]

"Mobile object identification system"

The primary object of the invention is to realize a mobile object identification system of simple construction and low cost, in which the responding unit attached to a mobile object writes data only once when it receives write signals repeatedly in communication with antenna units. When a tag unit (responding unit) receives a write signal from a writing antenna unit, it writes data to the data memory when a completion flag is cleared. When the data is first written, a control circuit sets the completion flag. Then, if the tag unit receives additional write signals in the communication area of the same writing antenna unit, the control circuit invalidates the data write command on the ground that the completion flag is set, thereby preventing duplicate data writing. [A3238]

"Ultra-wideband receiver"

An ultra-wideband (UWB) receiver utilizes a strobed input line with a sampler connected to an amplifier. In a differential configuration, .+-.UWB inputs are connected to separate antennas or to two halves of a dipole antenna. The two input lines include samplers which are commonly strobed by a gating pulse with a very low duty cycle. In a single ended configuration, only a single strobed input line and sampler is utilized. The samplers integrate, or average, up to 10,000 pulses to achieve high sensitivity and good rejection of uncorrelated signals. [A3239]

"Range-gated field disturbance sensor with range-sensitivity compensation"

A field disturbance sensor operates with relatively low power, provides an adjustable operating range, is not hypersensitive at close range, allows co-location of multiple sensors, and is inexpensive to manufacture. The sensor includes a transmitter that transmits a sequence of transmitted bursts of electromagnetic energy. The transmitter frequency is modulated at an intermediate frequency. The sequence of bursts has a burst repetition rate, and each burst has a burst width and comprises a number of cycles at a transmitter frequency. The sensor includes a receiver which receives electromagnetic energy at the transmitter frequency, and includes a mixer which mixes a transmitted burst with reflections of the same transmitted burst to produce an intermediate frequency signal. Circuitry, responsive to the intermediate frequency signal indicates disturbances in the sensor field. Because the mixer mixes the transmitted burst with reflections of the transmitted burst, the burst width defines the sensor range. The burst repetition rate is randomly or pseudorandomly modulated so that bursts in the sequence of bursts have a phase which varies. [A3240]

"Method for providing guiding assistance for a vehicle in changing lane"

Method of assisting a motor vehicle in changing from a current lane to an adjacent target lane. The space in front and the space behind the vehicle at least in the adjacent target lane is monitored, the distance of objects (in particular vehicles) detected there, and their speeds are measured, and safety distances calculated therefrom. If all the measured distances are greater than the calculated safety distances, a possible lane change is signalled. [A3241]

"Detection of multiple articles"

An identification system comprises an interrogator and a plurality of transponders. The interrogator includes a transmitter which transmits at least two independent interrogation signals to the transponders, and a receiver for receiving response signals from the transponders. The interrogator also includes processor means for identifying the transponders from data in the received response signals. Each transponder comprises receiving means, a code generator, and transmitter means connected to the code generator. On receipt of at least one of the transmitted interrogation signals the transponder transmits a response signal containing data which identifies it. The interrogation signals may be transmitted continuously or intermittently. In a preferred embodiment, the interrogation signals are relatively narrow bandwidth signals at different frequencies. The receiving means of each transponder has a relatively broad reception bandwidth so that the transponder is responsive to one or more of the interrogation signals. [A3242]

"Vehicle obstacle monitoring system"

A vehicle obstacle monitoring system for alerting a driver to the presence of an obstacle within a predetermined distance from the vehicle. The system includes a signal generator which radiates a signal around the vehicle and a plurality of signal receivers encircling the exterior of the vehicle. A display monitor located in the interior of the vehicle displays a zone image around the car and alerts the driver to the presence of an obstacle within the zone. [A3243]

"Intelligent area monitoring system"

An intelligent area monitoring system having a plurality of sensors (11,12,13,14,15,16) , a neural network computer (20) , a data communications network (28,30,32,42) , and multiple graphic display stations (40) . The neural network computer (20) accepts the input signals from each sensor. Any changes that occur within a monitored area are communicated to system users as symbols which appear in context of a graphic rendering of the monitored area. The sensors can be active or passive. Each sensor provides an analog output (54) . Codes are communicated to graphic display stations (40) via a data communications network (28,30,32,42) . Based on these codes, the graphic display stations (40) select and place symbols on their display screens to accurately represent the identity and location of targets in the monitored area. [A3244]

"Smart blind spot sensor with object ranging"

A radar system for sensing the presence of obstacles in a vehicle's "blind spots" and generating a signal to the vehicle operator indicative of the presence of such an obstacle. The system uses a common radar transceiver that transmits a multi-frequency radio signal directed at a blind spot of the vehicle. The signal is reflected off any obstacles that are present in that blind spot region. Doppler shifts in the received reflected multi-frequency signal generally indicates that an obstacle has moved into the blind spot. Doppler frequencies attributable to objects which are of no interest, such as stationary objects, are filtered out. The system has a signal processor which determines if a potentially hazardous object is within a pre-determined range from the vehicle. Only objects that are traveling at approximately the same speed and direction as the vehicle, and that are within a pre-determined range of the vehicle, are considered to be of interest, and will cause the blind spot sensor to generate an indication that an obstacle is present within the blind spot. The indication is preferably an unobtrusive illuminated indicator which is affixed to one of the vehicle's mirrors. In addition to the illuminated indicator affixed to a mirror, an obtrusive audible indicator is provided in the preferred embodiment of the present invention which creates an audible tone, whistle, or buzz when an obstacle is present and the vehicle's turn signal is active. [A3245]

"Meteorological workstation"

A meteorological workstation provides for editing of raw data at its input by providing intelligent control of extraction of data from one or more data streams of collected weather data. Commands by the operator to the graphics processing of a weather forecasting and numerical modelling application cause the generation of commands to a dedicated processor controlling acceptance or extraction of data. Thus, data to be processed is limited, at any given time, to the data actually needed by the meteorological workstation under user control and has the effect of allowing the workstation user to control the source of the data being collected. Intelligent direction of the selected data also allows the formation of messages and the issuance of advisories and warnings even when the workstation is unattended. [A3246]

"Navigation display apparatus for collison avoidance utilizing polygonal safety regions and predicted danger areas"

A navigation supporting display apparatus makes it easy for an operator of ship to navigate with a safe passing distance between own ship and a target by indicating an exact danger area between own ship and the target ship. The apparatus has a collision point calculator which calculates a possible collision point of each of the vertexes of a polygonal safe passing region set around own ship, and the target ship, from a relative position of the target ship, a velocity vector of the target ship and a velocity of own ship. The apparatus has an own-ship-mapping-position calculator which calculates a position at which own ship would be located when each of the vertexes places on the collision point, and defines the position as a own-ship-mapping-position. The apparatus further has a danger area calculator which determines lines joining own-ship-mapping-positions corresponding to the collision points with each other to define a danger area. The relation between connected own-ship-mapping-positions and the own-ship-mapping-positions are output to a display device, and the display device displays the area defined by the lines joining own-ship-mapping-positions as a danger area together with the position and the vector of own ship and the position of the target ship. [A3247]

"System for processing returns from a target from transmissions containing repeated signals to detect the doppler velocity of the target"

A signal processing system of reduced complexity over conventional banks of matched filters for each Doppler velocity of interest is responsive to a transmission which is in the form of a train of repeated Doppler invariant signals which are preferably phase continuous. The system utilizes a head end zero Doppler correlator and tapped delay line summer with summing nodes in cascade for each Doppler velocity of interest. The summer provides coherent sums indicative of the Doppler velocity of the target. [A3248]

"Built-in radiation structure for a millimeter wave radar sensor"

A compact radar system includes a dielectric substrate having an upper and lower surface. A ground plane is formed on the upper surface of the dielectric substrate and includes a radiating slot formed therein. A radar transceiver is located below the dielectric substrate and generates transmit signals. A frequency selective surface spaced above the dielectric substrate includes a radiating aperture with a plurality of uniformly spaced holes. The frequency selective surface decreases flow of electromagnetic energy from the radiating slot in one direction towards the transceiver and increases the flow of electromagnetic radiation in an opposite direction away from the transceiver. [A3249]

"System for distinguishing a vehicle traveling ahead based on an adjustable probability distribution"

An anticollision radar system for a vehicle is provided. This system includes a distance sensor for measuring distance to an object present in a given forward detectable range, and determines a curvature of a road on which the system vehicle is moving, determines the probability that the object present in a given forward detectable range of the distance sensor is identified as a preceding vehicle traveling on the same lane as the system vehicle in a preselected relation to the distance to the object measured by the distance sensor and the curvature of the road determined, determines a target speed based on the probability determined, and modifies the speed of the system vehicle to the target speed determined. [A3250]

"Apparatus for wind shear compensation in an MTI radar system"

The invention relates to apparatus for reducing the masking effect in the doppler frequency domain of wind sheared clutter upon the radar returns of moving targets. The invention consists in forming two beams from the elements of a radar antenna array by means of adjustable complex weights which are then summed. One of the two beams is then delayed by a predetermined amount and added algebraically to the other beam to form a composite beam containing a narrow trough-like depression in beam angle/doppler frequency space. Means are then provided for adjusting the weights to bring coincidence between the depression and the clutter to cause attenuation of the clutter with a minimum reduction in the usable doppler frequency domain. [A3251]

"Single antenna location and direction finding system"

The invention provides a circuit for analyzing backscatter-modulated RF signals received from a remote transponder to determine whether the transponder is stationary or moving toward the reader or away from it and, if moving, the rate at which the transponder is coming or going. The circuit of the invention can be integrated with existing readers of the type described in U.S. Pat. No. 4,739,328 and requires only a single antenna. In response to the signal received from a transponder, the invention circuit generates three signals, each having a different phase. By analyzing the pattern and frequency of signal state changes in the three signals, the invention can determine the transponder's speed and direction of movement. [A3252]

"Vehicular radar wayside transponder system"

Doppler control circuit for a CW or pulse Doppler radar system for monitoring not only the phase shift between echo signals from several targets but also the amplitude difference between the several targets and to further provide a phase lock loop which tunes the radar to a particular target among one or more targets from which echo signals return. The control circuit can be used in state of the art CW or pulse Doppler type radar systems. In a further system, a continuously generated radar signal is repeatedly transmitted at three different frequencies in time division fashion to define a succession of transmit and receive frames. The receive frames are divided into a plurality of time interval windows with selected windows being used to detect received signals at the different frequencies. The remaining windows can be used for subsystems of the radar system. The rate of phase shift of received signals at a center frequency is used to determine closing rate, while the phase shift difference between received signals at the other two frequencies is used to determine range. A subsystem of the vehicular radar system is provided, in which communications between the vehicle radar system and a wayside transponder take place within one of the remaining windows of the receive frames. The wayside transponders transmit multi-bit words to the vehicle to provide the vehicle with update information and to warn of possible hazards in particular locations. [A3253]

"Combined radar detector, speed measuring device and printer for verifying vehicle speed"

The disclosed device enables the user to verify the speed of their vehicle responsive to sensing that a radar device has been used to measure their speed. The device includes a radar detector designed to sense a radar beam. When the detector senses the beam, it activates a speed measuring device mounted on the vehicle which instantaneously measures the vehicle speed and then stores the measured speed for later display and for printing a permanent record, if desired. [A3254]

"Vehicle identification classification and communication system"

An interrogator-transponder system in which multiple vehicle mounted transponders which may be closely spaced in distance and moving at similar velocities are interrogated by interrogation signals that are identical for all interrogations. Digital coded data blocks consisting of an address code and a message code are transmitted on the interrogation frequency and are interleaved with the interrogation signals. Transponders respond with a coherent identification code and a message data code signal that is displaced in frequency from the interrogation signal by an amount that is identical for each transponder. The transponders decode interrogator data blocks that are associated with an address that is identical to the transponder identification code. The response signal spacings in time are difference for each transponder but are always multiples of the pulse repetition interval of the interrogation signal. Means are provided in the interrogation device to determine the velocity of each transponder, its range with respect to the interrogator, its identity and the contents of the transponder messages. Means are also provided to determine the range and velocity of transponder and nontransponder-equipped vehicles using the vehicle skin reflection of the interrogation signal. [A3255]

"CDMA communications and geolocation system and method"

A spread-spectrum CDMA communications system for locating remote units, and for communicating message data between a plurality of remote units and a base station. The spread-spectrum CDMA communications system includes a plurality of base stations and a plurality of remote units. A base station has a spread-spectrum modulator for spread-spectrum processing the message data, and a transmitter for transmitting the spread-spectrum processed-message data, combined with a generic-chip-code signal, from the base station to a remote unit. The base station also has an antenna, and spread-spectrum detectors for recovering message-data communicated from the remote-units. A remote-unit has an antenna, and a detector coupled to the antenna for recovering data communicated from the base station. The detector includes a spread spectrum demodulator. Also, the remote unit has a device for converting the format of the data into a form suitable for communicating over radio waves, a spread spectrum modulator and a transmitter. The base station has a range circuit, which comparers the generic-chip-code signal generated at the base station with the generic-chip-code signal received from the remote unit, for determining a range between the remote unit and the base station. [A3256]

"Continuous wave radar effective for preventing collision of mobile object"

A continuous wave radar for detecting a relative velocity between a target and a mobile object where the radar is loaded, and for detecting whether the mobile object is relatively approaching to or separating from the target. The radar has a hybrid circuit for branching an oscillation signal of a fixed frequency outputted from an oscillator into two oscillation signals. A transmitting antenna is provided for irradiating one of the oscillation signals branched by the hybrid circuit, and a receiving antenna is provided for receiving radio waves reflected from the target. The continuous wave radar further has an image cancel mixer for detecting, on the basis of the frequency of the other oscillation signal branched by the hybrid circuit, a first signal of an upper sideband frequency and a second signal of a lower sideband frequency of the received signal obtained via the receiving antenna. A signal processing circuit is provided for detecting the relative velocity of the mobile object to the target by processing the first and second signals, and detecting a relative approach of the target by processing the first signal or detecting a relative separation of the target by processing the second signal. [A3257]

"Radar sensor/processor for intelligent vehicle highway systems"

A radar sensor/processor for intelligent vehicle highway systems. The radar sensor/processor provides the range, speed, identity of, and selective communications with, vehicles equipped with a transponder in a first cooperative interrogator/transponder mode, and provides information on the range and speed of vehicles without a, or with an inoperative, transponder in a second noncooperative mode. The interrogator includes a first direct digital synthesizer, with an associated first input binary tune register, for producing a sine wave output, a multiplier for multiplying the sine wave output to produce an X-band signal, and a bi-phase single sideband modulator which modulates the X-band signal with data to be transmitted. The interrogator receiver receives a returned transponder reply signal, and includes a balanced mixer for downconverting the reply signal. A down-converted carrier signal is extracted, and is an input to a control loop which includes a second direct digital synthesizer, its associated second input binary tune register, a phase detector, and an A/D converter. The control loop rapidly adjusts the count in the second binary tune register to bring the output frequency of the second direct digital synthesizer into exact correspondence with the down-converted carrier signal. A subtraction of the respective counts in the input binary tune registers for the first and second direct digital synthesizers is a measure of the vehicle speed. [A3258]

"Traffic radar with digital signal processing"

A traffic radar processes Doppler return information by analysis of the received frequency spectrum in order to improve target identification and minimize interference and unwanted harmonics. Digital signal processing including transformation of the return information into the frequency domain is employed to provide multiple modes of operation including a stationary mode where either the strongest or the fastest Doppler return signal may be selectively recognized, and moving modes for monitoring traffic moving in both the opposite direction and the same direction as the patrol vehicle. In the moving modes either strongest or fastest signal processing may be elected, and operation when the patrol and target vehicles are moving in the same direction is provided irrespective of whether the patrol vehicle is moving faster or slower than the target vehicle. The speed of the patrol car is determined by recognizing a signature that exhibits an asymmetry due to the cosine effect. Interference and harmonics are detected and suppressed by recognizing unwanted harmonic patterns and eliminating signal magnitudes at the harmonic frequencies. The radar has multi-band capability and recognizes the frequency band of a selected antenna to automatically configure the radar for correct processing of Doppler return information. [A3259]

"Automobile navigation guidance, control and safety system"

An automobile is equipped with an inertial measuring unit, an RF GPS satellite navigation unit and a local area digitized street map system for precise electronic positioning and route guidance between departures and arrivals, is equipped with RF receivers to monitor updated traffic condition information for dynamic rerouting guidance with a resulting reduction in travel time, traffic congestion and pollution emissions, is also equipped with vehicular superceding controls substantially activated during unstable vehicular conditions sensed by the inertial measuring unit to improve the safe operation of the automobile so as to reduce vehicular accidents, and is further equipped with telecommunications through which emergency care providers are automatically notified of the precise location of the automobile in the case of an accident so as to improve the response time of road-side emergency care. [A3260]

"Ground unit for the detection, identification, and direction determination of a marker beacon"

A ground unit capable of being carried on the back of a member of the armed orces is used in conjunction with a marker beacon. The ground unit detects and identifies the signals from the marker beacon and is also capable of indicating the direction in which the marker beacon is located. for identification purposes, a received signal at the ground unit from the beacon is checked with a known identification code signal inserted in the ground unit by the user. Upon detection of the signal the user can determine the direction to the marker beacon by scanning with a hand-held antenna system. Visual and audio information is provided to the user. [A3261]

"Method and apparatus for improving the signal-to-clutter ratio of an airborne earth penetrating radar"

The method improves the signal-to-clutter ratio of an airborne earth penetrating radar for distinguishing subsurface objects from surface clutter or above-ground objects. The method relies on the dispersive response of the signals returned from an subsurface object to distinguish these subsurface signals from the non-dispersive response signals returned by surface clutter. The electromagnetic response from a subsurface object is spread out over time in comparison to the response from surface clutter. A correlation coincidence detection methodology discriminates surface clutter based on the temporal persistence of a subsurface object. The correlation procedure produces a sequence of values which are used as the basis for detection. If the radar pulses detect a subsurface object, the sequence of values persists beyond the interval of integration containing the clutter response. [A3262]

"Apparatus and method of warning rear-end collision"

A warning apparatus for warning of possible rear-end collision of a given vehicle having the warning apparatus with another vehicle preceding the given vehicle includes: a computer, a distance sensor for measuring a vehicle-to-vehicle distance to the another preceding vehicle, and a velocity sensor for measuring the velocity of the given vehicle. The computer computes a relative velocity of the given and the another preceding vehicle from a differential of the vehicle-to-vehicle distance and then computes an anticipated rear-end collision time by dividing of the vehicle-to-vehicle distance by the relative velocity of the given vehicle. The computer corrects the anticipated rear-end collision time in response to an acceleration and the relative velocity. The computer produces a warning of signal and an alarm is provided in response to the corrected anticipated rear-end collision time. A method of warning of a possible rear-end collision comprises the step of: detecting a vehicle-to-vehicle distance between a given vehicle and the another vehicle preceding the given vehicle, detecting a velocity of the given vehicle, computing an anticipated rear-end collision time T.sub.a of the given vehicle with the another vehicle, with an equation: ##EQU1## and producing a warning in response to the computed anticipated rear-end collision time T.sub.a. [A3263]

"Method and apparatus for monitoring the thickness of a coal rib during rib formation"

Apparatus for monitoring the position of a mining machine cutting a new entry in a coal seam relative to an adjacent, previously cut entry to determine the distance between a near face of the adjacent previously cut entry and a new face adjacent thereto of a new entry being cut by the mining machine which together define the thickness of a coal rib being formed between the new entry and the adjacent previously cut entry during the new entry-cutting operation. The monitoring apparatus, includes a transmit antenna mounted on the mining machine and spaced inwardly from the new face of the coal rib for transmitting radio energy towards the coal rib so that one portion of the radio energy is reflected by the new face which is defined at an air-coal interface between the new entry and the coal rib and another portion of the radio energy is reflected by the near face of the coal rib which is defined at an air-coal interface between the coal rib and the adjacent previously cut entry. A receive antenna mounted on the mining machine and spaced inwardly of the new face of the coal rib receives the one portion of the radio energy reflected by the new face and also receives the another portion of the radio energy reflected by the near face. A processor determines a first elapsed time period equal to the time required for the one portion of the radio energy reflected by the new face to travel between the transmit antenna and the receive antenna and also determines a second elapsed time period equal to the time required for the another portion of the radio energy reflected by the near face to travel between the transmit antenna and the receive antenna and thereafter calculates the thickness of the coal rib being formed as a function of the difference between the first and second elapsed time periods. [A3264]

"Simultaneous differential polymetric measurements and co-polar correlation coefficient measurement"

A polarimetric Doppler weather radar system which allows measurement of linear orthogonal polarimetric variables without a switch by using simultaneous transmission of horizontally and vertically polarized waves. This is accomplished by splitting the transmitted power into two waveguides and combining them with an orthomode coupler at the antenna feed. Thus, in general the transmitted polarization is elliptical but with equal amount of power in horizontal and vertical polarization. On reception, the power is divided, at the orthomode coupler, into linear horizontal and vertical components. These components are processed and combined to yield Doppler and polarimetric information about storm structure. [A3265]

"Distance measuring system"

A distance measuring system includes a base unit and a remote unit. The remote unit transmits a first radio frequency signal to the base unit. The base unit transmits a second radio frequency signal upon receipt of the first radio frequency signal from the remote unit. The remote unit measures the time between transmission of the first radio frequency signal and receipt of the second radio frequency signal, thereby enabling the distance between the base unit and the remote unit to be ascertained. The accuracy of the measured distance may be improved by averaging additional measurement cycles. [A3266]

"Fine-grained multi-planar clutter rejection processor"

A fine grained multi-planar clutter rejection processor (10) for correlating multiple sets of data. The processor (10) maps each set of data onto a plurality of arrays (28-34) . The data includes target data which is correlated between sets and clutter which is uncorrelated between sets of data. The system also includes a means for shifting (40) the positions of the second and subsequent arrays in a pattern which is larger for each successive array. In addition, a correlation identification unit (78) identifies the coordinate locations in the first array (28) which contain data points and which also contain data points in subsequent arrays in their shifted positions. In this way, data points identified in this manner are correlated and the remaining data points can be discarded as clutter. The processor (10) system is able to handle a very large number of data points per scan (over 100,000) over a high number of scans (such as eight) . Due to its highly parallel approach, the total processing time is completely independent of the number of data points or scans. [A3267]

"Expert system constant false alarm rate (CFAR) processor"

An artificial intelligence system improves radar signal processor performance by increasing target probability of detection and reducing probability of false alarms in a severe radar clutter environment. This utilizes advances in artificial intelligence and expert systems technology for the development of data analysis and information (signal) processors used in conjunction with conventional (deterministic) data analysis algorithms to combine radar measurement data (including observed target tracks and radar clutter returns from terrain, sea, atmospheric effects, etc.) with topographic data, weather information, and similar information to formulate optimum filter coefficients and threshold tests. Present fielded radar systems use one CFAR algorithm for signal processing over the entire surveillance volume. However, radar experiments have shown that certain CFAR algorithms outperform others in different environments. The system intelligently senses the clutter environment, and selects and combines the most appropriate CFAR algorithm (s) to produce detection decisions that will outperform a processor using a single algorithm. The invention provides for improved performance through the application of rule-based and data-based expert system computer software technology to CFAR signal processors, thereby improving target detection by reducing processing losses which result from a mismatch between the single, fixed CFAR processor and dynamically changing environment in which a radar must operate. [A3268]

"Wide band stepped frequency ground penetrating radar"

A wide band ground penetrating radar system (10) embodying a method wherein a series of radio frequency signals (60) is produced by a single radio frequency source (16) and provided to a transmit antenna (26) for transmission to a target (54) and reflection therefrom to a receive antenna (28) . A phase modulator (18) modulates those portion of the radio frequency signals (62) to be transmitted and the reflected modulated signal (62) is combined in a mixer (34) with the original radio frequency signal (60) to produce a resultant signal (53) which is demodulated to produce a series of direct current voltage signals (66) the envelope of which forms a cosine wave shaped plot (68) which is processed by a Fast Fourier Transform unit 44 into frequency domain data (70) wherein the position of a preponderant frequency is indicative of distance to the target (54) and magnitude is indicative of the signature of the target (54) . [A3269]

"Electrically powered postage stamp or mailing or shipping label operative with radio frequency (RF) communication"

The present application describes an electronically powered postage stamp or mailing label and including a radio frequency identification (RFID) device and system mounted between the opposing and facing major surfaces thereof. The RFID device and system includes an integrated circuit transceiver chip which is connected to and powered by a thin flat battery cell and is operated with a thin film RF antenna, all of which are mounted in side-by-side relationship on a thin base or support layer. These thin flat components are mounted in an essentially two dimensional planar configuration well suited for incorporation into the planar structure of a postage stamp or a mailing label. In addition, the RFID transceiver chip may be replaced with an electro-optically operated IC chip using, for example, LEDs or laser diodes for the propagation of light signals to an interrogator. [A3270]

"Detection and calibration of horizontal error in a scanning type radar device"

A method to determine a horizontal error of a radar device mounted on a vehicle along with the mounting error or imbalance in the diameters of wheels based on an echo signal from a reflector provided on a road. A vehicle's traveling locus is stored in advance as a reference locus obtained from the distance L between the vehicle and reflector and the direction .theta..sub.R. A traveling locus when the vehicle is actually traveling in a straight line where the steering handle is kept in a neutral position is compared with the previously stored reference locus. A horizontal error is obtained from the traveling locus on the coordinate axis .theta..sub.R and the shift from the reference locus. [A3271]

"Method of and apparatus for cruise control"

A vehicle cruise controller is provided which monitors the range to and relative speed of a target vehicle ahead of the vehicle being controlled by the cruise controller. A radar provides measurements of range and relative speed. The range measurement is compared by a subtracter with a desired range which is a function of vehicle speed, so as to form a distance error. The relative speed signal represents a speed error. An acceleration demand is formed as a function, for example, a weighted sum, of the distance and speed errors. More significance is given to the distance error when the target is relatively close. This is achieved by varying the gain of a multiplier. The acceleration demand may be supplied to vehicle brake and drive systems, but preferably the acceleration demand is compared with actual vehicle acceleration to provide the advantages of closed loop control. [A3272]

"Monopulse transceiver"

A dual channel monopulse transceiver is described for use at millimeter wavelengths and for the detection of targets for vehicle collision avoidance. A microstrip antenna is located on one side of a plate and a transceiver microstrip circuit coupled to the antenna is located on the other side of the plate. The transceiver includes a reflective balanced mixer, an isolated balanced mixer and a hybrid circuit for connecting the mixers to antenna feed points. Sum and difference signal generating circuits are employed to provide single and split antenna beams for the detection of targets. [A3273]

"Autonomous cruise control"

A cruise control system for a vehicle includes a vehicle borne radar for determining range and closing rate of the vehicle relative to a target, such as another moving vehicle, ahead of the vehicle. The range and closing rate are used to determine a new set speed for the cruise control system which may be less than but is not greater than the speed entered in the cruise control by the driver of the vehicle. The new set speed is selected to prevent the vehicle from overtaking the target, and ideally reduces the closing rate to zero at a predetermined minimum distance from the target. In determining the new set speed, the system also determines incremental movements for the vehicle throttle using a selected gain boost and designed to minimize throttle jerk. If the target moves out of the path of the vehicle or speeds up, the system adjusts accordingly and eventually allows the vehicle to resume the originally entered speed when possible. [A3274]

"Single loop transponder system and method"

An apparatus including an object 10 associated with a contactless, electronic identifier is disclosed herein. In one example, the object 10 is a trash bin. This object 10 is formed from a non-conductive material. A single-loop antenna 14 is disposed adjacent the object 10. An impedance transformer 18 which is matched to the single-loop antenna 14 is used to generate a desired inductance. A transponder 12 is also disposed near to and associated with the object 10. The transponder 12 is coupled to the antenna 14 through the impedance transformer 18. [A3275]

"Transponder interface circuit"

A transponder interface circuit (172) operates to allow communication between a transponder controller (104) and external circuitry. The interface circuit (172) has a buffer memory (184,186) that allows the transponder controller (104) and the external circuitry each to transmit data at either the transponder's (14) or the external circuitry's clock rate without complicated protocols for direct communication. Each of the transponder controller (104) and the external circuit may be enabled by an interface controller (174) to assume control of the buffer memory (184,186) . By using the buffer memory (184,186) and interface controller (174) , whichever of the transponder controller (104) and the external circuitry is transmitting or receiving data may fill or empty the buffer memory (184,186) at either the transponder controller's (104) or the external circuitry's chosen clock rate. The interface controller (174) will monitor the transfer such that when the buffer memory (184,186) is full or empty, the interface controller (174) will send a command to the appropriate transponder controller (104) or external circuit to either receive data from the full buffer memory (184,186) or transmit data to the empty buffer memory (184,186) . [A3276]

"Active signalling systems"

A signalling system in time-frequency space for detecting targets in the presence of clutter and for penetrating media, includes a transmitter antenna system, receiver and processor system. The transmitter antenna system generates and launches into a medium containing the targets an energy pulse (wave packet) having a predetermined duration and frequency characteristic, and which energy pulse matches at least one of the following: 1) the time-frequency reflection characteristics of the target (s) but not the clutter, or 2) the penetration time-frequency dielectric window of the medium, or 3) the time-frequency characteristics of the window of the receiver. Preferably, the time-frequency wave packet is the complex conjugate of the impulse response of the combined medium and target. The processor solves the wave equation for transmissions through the medium, reflectance from the target (s) and transmission back through the medium and causes a match of the generated wave packet signals to both the medium and target for maximum propagation through the medium and reflectance from the target, the wave packet match to the medium and the target being with respect to both time and frequency response characteristics. [A3277]

"Automatic real-time highway toll collection from moving vehicles"

One or more roadside collection stations (RCS) communicate over a short-range, high speed bidirectional microwave communication link with one or more in-vehicle units (IVU) associated with one or more respectively corresponding vehicles in one or more traffic lanes of a highway. At least two up-link (IVU to RCS) communication sessions and at least one downlink (RCS to IVU) communication session are transacted in real time during the limited duration of an RCS communication footprint as the vehicle travels along its lane past a highway toll plaza. Especially efficient data formatting and processing is utilized so as to permit, during this brief interval, computation of the requisite toll amount and a fully verified and cryptographically secured (preferably anonymous) debiting of a smart card containing electronic money. Preferably an untraceable electronic check is communicated in a cryptographically sealed envelope with opener. Transaction linkage data is utilized in each phase of the complete toll payment transaction to facilitate simultaneous multi-lane RCS/IVU operation. A plaza computer local area network and downlink plaza controller is also used to facilitate simultaneous multi-lane transactions. [A3278]

"Complex MTI filter"

Entered complex data is phase-rotated by the corresponding to the moving velocity of the clutter component. Then clutter component information is eliminated by a real type MTI filter assembly. Thereafter, the output data of the real type MTI filter assembly is reversely phase-rotated. [A3279]

"Method and apparatus for determining the location of a vehicle"

Vehicle navigation systems typically include devices for determining the location of the vehicle. In many situations it is advantageous to improve the resolution of such devices or to provide a back-up system for determining vehicle location. Simple and efficient systems are also desirable when used as the primary positioning systems. The subject invention provides a simple and efficient system for determining the location of a vehicle in a base reference frame. One or more targets are located at predefined positions with respect to the base reference frame. A target sensing device determines a position of one of the one or more targets with respect to the vehicle. A device determines an estimated vehicle position. A vehicle locating device determines the location of the vehicle with respect to the base reference frame in response to the position of the target with respect to the vehicle and the estimated vehicle position. [A3280]

"Method for measuring the distance and velocity of objects"

In a method for measuring the distance and the velocity of objects employing electromagnetic waves, the frequency of an emitted signal is modulated. The signals received during one rise and one drop in the frequency of the emitted signal are mixed with the emitted signal. The intermediate-frequency signals resulting from the mixing are then spectrally analyzed. The distance and the velocity of at least one object are calculated from the frequency of the spectral lines of the intermediate-frequency signals during at least one rise and at least one drop in the frequency of the emitted signal. [A3281]

"Radar terrain bounce jamming detection using ground clutter tracking"

A radar jamming detection system is suitable for recognizing and distinguishing the presence of jamming and, particularly, terrain bounce jamming. The radar system includes a transmitter and a receiver. The receiver receives true radar skin return signals, in addition to ground clutter signals and jamming signals. The true radar skin return signals and ground clutter signals are recognizable in accordance with a predetermined receiver passband.

Estimated target location, velocity and frequency data, as provided by a cueing radar, is used to set up the receiver passband for the radar detection system. Ground clutter range and angle measurements are used to determine an estimated ground range at the jammer angle, which is then compared with the cue range to determine if the received signals are terrain bounce jamming signals. [A3282]

"RF imaging of low observable coatings using a wire-over-ground-plane transmission line"

A non-destructive test system that displays time domain amplitude returns from multi-frequency, multi-phase, constant magnitude RF signals, that are reflected by differences in characteristic impedance of a wire over ground plane transmission line. The reflections are used to detect RF discontinuities or faults in conductive areas that form the ground plane which preferably are resolved using a generalized pencil-of-points algorithm. The nondestructive testing system so constructed is especially useful in testing field repairs of radar absorbing material (RAM) and other features of a conductive object or vehicle whose radar return is to be minimized. [A3283]

"Broadcast system for a facility"

A broadcast system for a facility including audio and video signal generators that may also include the audio output of a microphone for forming broadcast signals. The broadcast signals include a program signal, a supervisory program signal and a supervisory alert signal. The power supply for monitoring stations and broadcast signals are combined to form an output signal that is broadcasted throughout the facility. A bus distributes the output signal in the facility to each of a plurality of monitor stations. Each monitor station includes decoders to recover the audio and video signals and form a resident power supply for that monitor station only from the output signal on the bus. The monitor could also includes a video monitor and speaker coupled to the resident amplifier to the resident power supply for responding to any of the broadcast signals. A resident controller controls the resident amplifier when receiving a program signal supplied to the monitor. A resident executive controller disables the resident controller and applies a recovered supervisory alert signal and supervisory program signal to the resident amplifier. [A3284]

"Doppler radar system for automotive vehicles"

A continuous wave Doppler radar system having a transmitter module and a receiver module is provided for automotive vehicles. Each module includes an antenna system, including a horn, a lens, and a waveguide system, which is attached to a monolithic microwave integrated circuit (MMIC) chip that provides all necessary electronic functions. Each MMIC chip may be attached to a metal base heat sink, which may be conveniently connected to a base plate heat sink that holds the entire radar assembly. The transmitter module includes a voltage controlled oscillator (VCO) that generates a VCO frequency signal which is amplified and switched sequentially to three multiplier chains for transmission in three different directions. Each transmit signal is taken off the MMIC chip by a dielectric waveguide and directed to the antenna system. The receiver module includes three receivers that are selected sequentially to provide a beam azimuth scanning function. A reference local oscillator is provided at the VCO frequency by electromagnetic radiative coupling from the VCO of the transmitter module. Information on the location and relative speed of a radar target are obtained by comparing the frequency of the signal reflected by the target with the frequency of the signal radiated by the transmitter module. Quadrature mixers are used for each receiver channel to output low frequency data signals containing amplitude and phase information on the received reflected signal. Radar directional discrimination is achieved by sequential selection of the mixer output signals. [A3285]

"Power supply and power enable circuit for an RF/ID transponder"

A power supply self-contained within a portable RF/ID transponder includes a full wave rectifier having an input for receiving an antenna signal and outputs for providing power supply and ground voltages, wherein the power supply voltage has a time varying voltage waveform corresponding to the electric field generated by a reader/controller. The power supply further includes a clamping circuit for regulating the power supply voltage and a ferroelectric filter/storage capacitor coupled between the power supply and ground outputs of the full wave rectifier. The power supply further includes a power enable circuit for constantly monitoring the supply voltage waveform and for providing a power enable indication after an initial portion of the supply voltage waveform rises above a predetermined power-up threshold level and for removing the power enable indication when a terminal portion of the supply voltage waveform falls below a predetermined power-down level. The power-up and power-down thresholds describe a proper voltage range of operation for the ferroelectric memory in the transponder. The power enable indication is provided to the ferroelectric memory so that the memory is only operated when the power supply voltage is within the proper range so that data is valid during read and write operations. [A3286]

"Vehicle collision judging system for controlling brake actuation"

A collision judging system for a vehicle comprises a subject vehicle position estimating means for estimating the position of the subject vehicle after a lapse of a preset time from a certain braking start time, on the assumption that the braking is starting at such braking start time, an obstacle position estimating means for estimating the position of an objective obstacle after the lapse of the preset time, and the judging means for judging whether or not the position of the subject vehicle estimated by the subject vehicle position estimating means and the position of the obstacle estimated by the obstacle position estimating means coincide with each other. Thus, the judgment of collision can be performed with the avoidance of the collision by the driver's operation being taken into consideration, leading to an improved feeling of driving operation. [A3287]

"Tagging system having resonant frequency shift compensation"

A tagging system (20) compensates for both resonant frequency spatial dependent shifts and resonant frequency dependent shifts for detecting data resonant circuits (DC1-DC6) on an RF tag 10 which is carried by a tagged object (34) . The system includes at least one transmitter (26) and at least one receiver (28) for determining the actual resonant frequencies of reference resonant circuits (SC1-SC5, FC1-FC4) on the tag 10. A microprocessor controller (22) , in response to the frequency difference between the undisturbed resonant frequencies of the reference resonant circuits and the actual resonant frequencies of the reference resonant circuits, provides compensating factors to compensate for the spatial and frequency effects of the resonant frequencies of the resonant circuits on the tag (10) . The transmitter and receiver determine the actual resonant frequency of each data resonant circuit (DC1-DC6) on the tag (10) . The microprocessor controller (22) then determines the undisturbed resonant frequencies of the data resonant circuits on tag (10) from the actual resonant frequencies of the data resonant circuits and the compensation factors. [A3288]

"Electromagnetically propelled high-speed high-capacity transportation system for short-distance travel in urban and suburban areas"

An electromagnetically propelled transportation system designed to provide extremely high capacity at travel speeds between 50 and 150 miles per hour, to serve as a means of transportation within contiguous urban and suburban areas. The transportation system includes centrally controlled vehicles operated on a dedicated guideway, propelled by an embedded linear synchronous motor or other linear motor, which uses coils embedded in the guideway to carry an electric current which provides the propulsion force for vehicles on the guideway. In addition, the transportation system includes other components necessary to the operation of a high-capacity high-speed urban transportation system, such as off-line stations, entry and exit ramps, for acceleration and deceleration, which connect stations to the dedicated guideway, with appropriate branching to permit the same vehicle flow rate on the ramps as on the dedicated guideway, and means of switching or steering vehicles between the ramps and the guideway. Provision is made for passengers to obtain automated entry to the system. Vehicles have dual-use capability, so as to be able to operate on city streets as well as the dedicated guideway. [A3289]

"Collision avoidance and warning system"

A collision avoidance and warning system for land vehicles including radar transmission and receiving apparatus for sensing the presence of objects within a spatial range relative to a vehicle, multiple target tracking apparatus receiving an output from the radar transmission and receiving apparatus for tracking a plurality of targets sensed by the radar transmission and receiving apparatus, auxiliary non-radar target sensing apparatus and alarm decision apparatus receiving an input from the multiple target tracking apparatus and from the auxiliary non-radar target sensing apparatus for indicating the alarm status of a target and providing an output indication to alarm generating apparatus. [A3290]

"Multi-stage transponder wake-up, method and structure"

A system and method which conserves energy in the operation of a transponder or tag (14) by providing that the transponder (14) be enabled or awakened in multiple stages. A threshold detector (62) is provided which measures the power level of received RF energy. If the RF energy received by the detector (62) exceeds a pre-determined level, the transponder (14) then employs a modulation detector (64) to ascertain whether it has been awakened by a valid interrogation signal from an interrogator (12) or whether the RF energy received was merely a spurious burst of RF energy from some other source. If a pre-determined modulation is detected by the modulation detector (64) , the transponder (14) is then fully activated to its normal operational state. [A3291]

"Receiver antenna for bistatic doppler radar network"

A multiple-Doppler radar network can be constructed using only one, traditional, transmitting pencil-beam radar and one or more passive, non-transmitting receiving sites. Radiation scattered from the pencil beam of the transmitting radar as it penetrates weather targets can be detected at the receive-only sites as well as at the transmitter. In a bistatic system, the location of targets in Cartesian space can be calculated from the pointing angle of the transmitting antenna and the time between transmission of a radar pulse from the transmitter and detection at a passive receiver site. [A3292]

"Overlaying spread-spectrum satellite system and method"

A spread-spectrum satellite system for communicating data and paging messages to a plurality of remote units. The spread-spectrum communications system has a satellite with an antenna beamwidth located within a same geographical region as covered by an existing FDMA, TDMA or other mobile-satellite system. The spread-spectrum satellite system has a device for converting the format of the data into a form suitable for communicating over radio waves, a spread-spectrum modulator for spread-spectrum processing the data, and a transmitter for transmitting the spread-spectrum-processed-converted data from the satellite to a remote unit. The remote unit has an antenna and a spread-spectrum receiver for recovering data communicated from the satellite. The remote unit optionally may have a comb filter for notch filtering mobile channels of the mobile-satellite system. [A3293]

"Passive SAW-ID tags using a chirp transducer"

A Passive Surface Acoustic Wave Identification Tag ("SAW-ID tag") device utilizes pulse compression techniques and a large number of coding possibilities for identifying articles at enhanced ranges. The SAW-ID tag device provides a piezoelectric substrate having bus bars, spaced electrode taps between the bus bars and a built-in antenna, with an input chirped SAW transducer having a dispersive, complementary matched filter response to an input expanded chirp signal from an expanded linear FM chirp waveform actively generated by a nearby chirp transmitter. The input expanded chirp signal is fed into the input chirped SAW transducer through the built-in antenna, to compresses the input expanded chirp signal into a narrow, compressed pulse signal propagating toward the electrodes taps. The spacing of the electrode taps establishes the desired unique time-ordered coding. The electrode taps sample the narrow, compressed pulse signal and provide narrow, compressed pulse samples propagating a coded, pulse train output transmitted via the antenna to a nearby interrogation means to identify the tagged article. The preferred embodiment is an SAW-ID tag device with a piezoelectric quartz substrate about 1 inch long, a built-in dipole antenna and five (5) spaced electrode taps, establishing several million coding possibilities. Also disclosed are methods of identifying articles using an SAW-ID tag device, and methods of selectively disconnecting and connecting electrodes to facilitate mass production. [A3294]

"Receiver for bistatic doppler radar network"

A multiple Doppler radar network can be constructed using only one, traditional, transmitting pencil-beam radar and one or more passive, non-transmitting receiving sites. Radiation scattered from the pencil beam of the transmitting radar as it penetrates weather targets can be detected at the receive-only sites as well as at the transmitter. In a bistatic system, the location of targets in Cartesian space can be calculated from the pointing angle of the transmitting antenna and the time between transmission of a radar pulse from the transmitter and detection at a passive receiver site. [A3295]

"Oceanographic and meteorological data"

A method of obtaining oceanographic and meteorological data from high frequency radar spectral information including the steps of transmitting a plurality of signals to a remote geographic location, recording signals backscattered from the said location, generating a family of Doppler clutter spectra from the recorded backscattered signal and analyzing the Doppler clutter spectra in terms of a model or models to generate oceanographic and meteorological data estimates. The Doppler spectra are categorized according to Suitability for Deatiled Analysis (SDA) . The SDA takes account of the clutter-to-noise ratio in the spectrum, the amplitudes of the Bragg-lines, multimode propagation, spectral broadening and other spectral parameters. Spectra with a low SDA are inappropriate for extracting directional wave spectrum estimates of reasonable accuracy but are useful for obtaining wind direction estimates. Spectra with a high SDA are capable of being inverted to provide good quality estimates of the extended directional wave spectrum. [A3296]

"Obstacle detection system for motor vehicle"

An obstacle detection apparatus for a motor vehicle detects another vehicle traveling in front of the vehicle as an obstacle. The apparatus has a first unit, providing a course on which the vehicle is supposed to travel, a second unit, providing a reserve course located outside of the course, an obstacle detector detecting the other vehicle traveling in the course or the reserve course as an obstacle, and an obstacle detection continuation unit continuously detecting the other vehicle until a predetermined condition has been satisfied when the other vehicle moves from the course to the reserve course. [A3297]

"Obstacle sensing apparatus for vehicles"

An obstacle sensing apparatus for vehicles is provided in which detection of obstacles is performed efficiently by predicting the traveling path of the vehicle appropriately when detection of obstacles by a radar unit is limited to a region along the traveling path. The apparatus is provided with a radar unit for transmitting radar waves ahead of the vehicle and sensing obstacles present ahead of the vehicle, a steering angle sensor for sensing the steering angle of the vehicle, and a yaw rate sensor for sensing the yaw rate produced by the vehicle. First traveling-path predicting device predicts a traveling path of the vehicle based upon the steering angle, and second traveling-path predicting device predicts a traveling path of the vehicle based upon the yaw rate. One of these traveling paths is selected in dependence upon the operating state of the vehicle and detection of articles by the radar unit is carried out within a limited region along the traveling path selected. [A3298]

"Phased array based radar system for vehicular collision avoidance"

A phased array based radar and vehicular safety warning system for collision avoidance, including a phased array based radar, a controlling processor, and a warning system that also provides a warning to the driver of the equipped vehicle as well as drivers of other, non-equipped automobiles involved in an unsafe driving condition. The phased array radar includes a flexible antenna array that may be mounted conformally on existing automobiles without detracting from their design curvature. In one embodiment a pair of phased array radar antenna may be oriented towards opposing sides of an equipped automobile to provide warning surveillance of vehicles laterally approaching the equipped auto from the sides. In another embodiment a phased array radar antenna is oriented to the rear of the equipped automobile to provide warning surveillance of vehicles following the equipped auto too closely, and for warning of unsafe lane changes. In still another alternative embodiment a pair of phased array radar antenna having 180.degree. fields of view may be installed in a pod mounted on the roof of the equipped automobile to provide 360.degree. warning surveillance coverage. [A3299]

"Method and apparatus for determining driver fitness in real time"

A method and apparatus for evaluating a driver's performance under actual real-time conditions and for using such evaluations to determine the driver's ability to safely operate a vehicle compares the information gathered by a radar system and other sensors with information previously stored in an event recording device. Conditions monitored are used to make a determination as to whether the driver is performing in conformity with normal driving standards and the driver's own past performance. The driver's performance is constantly monitored and compared to that driver's past performance to determine whether the driver's present performance is impaired, and if so, whether the impairment is detrimental to the driver's ability to safely operate the vehicle. [A3300]

"MTI using a polyphase code"

An improved MTI radar system including a signal expander/compressor for providing palindromic P2 phase-coded upswept and downswept expanded signals that are alternately transmitted by a radar transmitter. The echos from the upswept and downswept signals are received by a receiver, compressed in the signal expander/compressor and inputted to an MTI subtractor. Since the autocorrelation sidelobes of the palindromic phase coded echos are real, the echos from stationary clutter are completely cancelled so that the system is capable of detecting weak echos from moving targets. [A3301]

"Remote controlled guidance system for working vehicle"

A remote control method of guidance for a work vehicle including a handheld control unit, an antenna/transponder placed on the periphery of the worksite, a controlling unit on the work vehicle itself. The control unit compares timing signals to subsequently control of the speed of independently powered wheels. There is a manual and automatic mode of control for the vehicle. The vehicle is positioned at a starting point by the user, and upon activation of the automatic mode, a timing pulse, either ultrasonic or electromagnetic is issued from the control unit on the vehicle. When the pulse is sensed by the transponder on the antenna, a responding pulse is transmitted. This is, in turn, received by the vehicle and thus a base time is set for the interval between the transmission of the pulse and the return signal from the transponder, the interval being indicative of the distance between them. The vehicle moves forward while continuing at intervals to send the pulse and if the secondary timing interval is larger than the base interval, the inner wheel is slowed to bring the vehicle closer. If the interval is shorter, the inner wheel is speeded up to move the vehicle away from the transponder. Thus, the vehicle describes a smooth arc about the transponder until the user sends another signal to the device, indicating that the device is to move a preset distance further away from the transponder, reset the base interval, and continue. [A3302]

"Real-time holographic surveillance system"

A holographic surveillance system including means for generating electromagnetic waves, means for transmitting the electromagnetic waves toward a target at a plurality of predetermined positions in space, means for receiving and converting electromagnetic waves reflected from the target to electrical signals at a plurality of predetermined positions in space, means for processing the electrical signals to obtain signals corresponding to a holographic reconstruction of the target, and means for displaying the processed information to determine nature of the target. The means for processing the electrical signals includes means for converting analog signals to digital signals followed by a computer means to apply a backward wave algorithm. [A3303]

"Method for determining target velocity by measuring phase shift"

A method for determining velocity of a target object comprises transmitting a propagating wave emitted from a wave transmitter and detecting a reflected wave reflected back by the target object by using a wave receiver, and determining of a phase angle difference between two alternating electrical signals respectively representing the transmitted wave departing the wave transmitter and the reflected wave arriving at the wave receiver, wherein the velocity of the target object is determined as a function of the time rate of change of the phase angle difference between the two alternating electrical signals. [A3304]

"Adaptive cruise control"

Adaptive cruise control speed limiting consistent with sensor and system limitations ensures an adaptive cruise control source vehicle operates in adaptively controllable speed ranges including speed ranges corresponding to following distances within the sensor range and excluding speed ranges at which preceding targets are not reliably distinguishable by the sensing system. [A3305]

"Transponder systems for automatic identification purposes"

A method of communicating between an interrogator (10) and at least a first and second transponder (12) . The transponders (12) are separately located within a first and a second vehicle (20) travelling within a first and a second traffic lane, respectively. The method has the steps of providing a first and a second LF antenna (16) associated with and proximity to a first and a second traffic lane, respectively. From each of the first and second LF antennas (16) a continuous LF subcarrier is transmitted to serve as a clock signal for each antenna's associated transponder (12) . Initially, a wake-up signal is sent by each of the LF antennas (16) to its associated transponder (12) . Following the wake-up signal, a unique lane code is sent by each of the LF antennas (16) to its associated transponder (12) . The transponder (12) stores its unique lane code in its memory (70) . The transponder then sends a UHF response in a pre-determined time period depending on the unique lane code stored in each of the transponders (12) . The time period in which the transponder (12) sends its UHF response is unique to that transponder (12) so that interference between responding transponders (12) is avoided. Other devices, systems and methods are also disclosed. [A3306]

"Vehicle collision prevention system using the Doppler effect"

A vehicle collision prevention system for preventing a source vehicle from colliding with an obstruent object comprising detection circuitry adapted for detecting and providing an indication of an impending collision with an obstruent object, the detection circuitry further comprising transmission circuitry adapted to transmit a preselected reference signal with a known frequency, reception circuitry adapted to receive a modulated reference signal reflected from an obstruent object, compensation circuitry adapted to receive environmental inputs external to the source vehicle and provide a measure of source vehicle velocity, processor circuitry coupled to the transmission circuitry, reception circuitry, and compensation circuitry, the processor circuitry adapted to control and monitor the transmission and reception of a reference signal, calculate its propagation time to and from an obstruent object, and determine its reflected strength, determine the approximate propagation velocity of the reference signal and obstruent object with respect to the environmental inputs, determine the frequency of the reflected reference signal based upon the Doppler effect, and determine the approximate distance to the obstruent object based upon the reflected reference signal frequency, signal strength and propagation velocity and generate a distance signal indication, indication circuitry coupled to the detection circuitry and adapted for providing an indication of the distance to the obstruent object based on distance signal indications, and a energizing mechanism for energizing the detection circuitry and indication circuitry. [A3307]

"Automatic starting and stopping apparatus for an engine"

The present invention relates to an automatic starting and stopping apparatus for an engine, which prolongs the lives of mechanical components such as a starter motor and which is applicable also to automatic vehicles. The automatic starting and stopping apparatus for an engine comprises a vehicle-to-vehicle distance sensor 29, which detects whether the distance from the preceding vehicle is less than a preset value, a signal color identifying and detecting device 30, which identifies whether the lit color of the signal is yellow or red, a car speed sensor 15, and a control circuit 31, which performs automatic start and stop of the engine in accordance with the detection results of the vehicle-to-vehicle distance sensor 29 and the signal color identifying and detecting apparatus 30. The control circuit 31 carries out automatic stop by cutting off the electric power to the engine ignition circuit 3 if the vehicle-to-vehicle distance is less than the preset value or the signal indicates a yellow or red light and also the car speed is zero, while it supplies electric currents to the starter 8 and the engine ignition circuit to implement automatic start when the vehicle-to-vehicle distance has reached the preset value or more or the lit signal color has changed from red to green. [A3308]

"Transponder maintenance mode method"

A method and system is provided for communicating permanent or semi-permanent information to a transponder (14) from an interrogator (12) , preferably operated by a toll agency or other authorized entity. This permanent or semi-permanent information is communicated by means of special instructions valid only during a special mode or maintenance mode which is entered by transmitting a special access code to the transponder (14) from the authorized interrogator (12) . The transponder (14) will preferably acknowledge to the authorized interrogator (12) that it is, in fact, operating in the maintenance mode so the interrogator (12) can transmit the special instructions in confidence. [A3309]

"Stereophonic warning apparatus"

A stereophonic warning apparatus for a vehicle is provided with a judging device which judges warning priority level relative to an object around the vehicle according to signals from radars for detecting the object and a vehicle behavior detecting device. A control device controls the output level of a plurality of speakers in a passenger compartment of the vehicle according to the position of the detected object such that the speakers output a warning sound to form a sound image at a position to which the detected object is located, while changing the warning sound according to the warning priority level. [A3310]

"Electronic life detection system"

The invention relates to an electronic life detection system, in particular for the searching for buried persons and the surveillance of buildings, having a microwave transmitting/receiving device for generating and radiating microwaves into an area to be investigated and for registering the microwave signal reflected from the area under surveillance and modulated with the frequencies corresponding to the life functions of any living beings present in the area, which device has a first signal-conditioning device, and a second signal-conditioning device. [A3311]

"Modulation field detection, method and structure"

Disclosed is a system and method which protects a transponder or tag (14) from being enabled or awakened by spurious RF energy. A modulation detector (64) is provided which detects a modulation signal that is superimposed upon an RF modulation from an interrogator (12) . Preferably this superimposed modulation is of a low frequency, below those typically existing as Electro-Magnetic Interference (EMI) , such that the transponder (14) is less likely to be erroneously activated by an unintended RF signal. Upon reception of an RF interrogation having the proper modulation superimposed thereupon, the modulation detector (64) is operable to awaken other circuitry within the transponder (14) such that the transponder (14) is then operable to communicate with the interrogator (12) . [A3312]

"Dual alarm apparatus for monitoring of persons under house arrest"

A monitoring system determines the presence of the person or persons to be monitored within a well-defined area or areas using one or more portable remote devices which are in two-way communication contact with a base unit. The base unit is connected to a telephone line to enable communication with a monitoring service. The base unit and remote unit incorporate spread spectrum communication technology which permits a high transmit power level. The effectiveness of the monitoring system does not depend on radio signal strength, but instead, operates using a radio ranging method that measures the time it takes for a security-coded signal to be transmitted to and returned from the remote device. The remote device also includes a mechanism for sounding an audible out-of-range warning alarm in the event that the person being monitored exceeds the house arrest boundaries. A second audible alarm preferably sounds from the remote device and the base device at predetermined times after the sounding of the out-of-range alarm if the person does not return to the house arrest area. [A3313]

"Enclosed transceiver"

An enclosed transceiver includes an integrated circuit and a battery together laminated between two films. Printed conductors on each film couple operative power to the integrated circuit. Other-printed conductors form an antenna coupled to the transceiver for sending and receiving signals. In a preferred embodiment, the integrated circuit has three terminals. The first terminal is connected to a first side of a thin film battery. The second terminal is connected to a first side of a printed loop antenna. The third terminal serves two purposes being connected to the second side of the battery and to the second side of the loop antenna. The enclosing films are treated with silicon nitride for hermeticity. Enclosed transceivers of the present invention are suitable for mass production in web, sheet, and tape formats. Such transceivers are useful as stamps, labels, and tags in object tracking systems including systems for mail delivery, airline baggage tracking, and inventory control. [A3314]

"Resonant tag and method of manufacturing the same"

A resonant tag is manufactured in the manner described below: a conductive thin film is formed to a predetermined thickness on two surfaces of an insulating thin film. Thereafter, a conductive pattern, composed of an inductor element and a capacitor element corresponding to a resonant frequency of a resonant circuit, is printed on a surface of one of the conductive thin films, and a conductive pattern, composed of a capacitor element corresponding to the resonant frequency of the resonant circuit, is printed on a surface of the other insulating thin film at a position which faces the capacitor element formed on one of the conductive thin films using an ink which resists etching. A non-printed portion of the conductive thin films is removed by etching to form a resonant circuit pattern. Thereafter, a portion of the insulating thin film, which corresponds to the capacitor element pattern, is thinned to a desired thickness by pressing a heating/pressing member heated to a predetermined temperature against that portion under a predetermined pressure for a predetermined period of time. [A3315]

"Low-cost compact microwave antenna for a transmitter and/or receiver system mounted in a vehicle"

The antenna is produced by placing radiating elements (70) in at least one of the spaces occupied by the various vehicle external lights. The radiating elements can be dipoles formed by metallizing the lens (43) which closes the headlight casing (40) and the casing itself can be used to reflect the electromagnetic energy forwards. [A3316]

"Extremely high frequency vehicle identification and communication system"

Apparatus and method for allowing ground vehicle identification and communication utilizing IFF equipment consisting of a multi-channel extremely high frequency transmitter for IFF and data transmissions and a receiver for multi-frequency conversions and multi-channel reception. The apparatus and method has both an IFF mode of operation in which the vehicle is able to identify itself and a communications mode in which the vehicle transmits vehicle status information to other vehicles and a command unit. The transmitter comprises a first and second oscillator means for generating a number of frequency tones and a power combiner for combining the tones prior to transmission. A controller monitors the transmitted signal and operates the first and second oscillation means. The receiver consists of a channelizer for separating a received signal into separate frequency tones and a measuring means for determining the values of the frequency tones. A controller controls the comparison or decoding of received signals. [A3317]

"System for bidirectional data transmission between a plurality of stationary units and a vehicle"

A system is proposed for bidirectional electromagnetic transmission of data signals between at least two stationary units and one vehicle unit. The stationary units in the downlink mode synchronously transmit the data signals to the vehicle unit and have different carrier frequencies. In the uplink mode, the data signals are transmitted from the vehicle unit to the stationary units by the semipassive transponder principle. In the process, the data signals of the vehicle unit are frequency-modulated to the various carrier frequencies of the stationary units. This arrangement improves the reliability of bidirectional data transmission. A preferred application is data exchange for traffic control systems between stationary beacon units and moving vehicles. [A3318]

"Process and device for evaluating the precipitations over an area of terrain"

Automatic rain gauges (P00-P0n) are employed within the area of terrain (ZT) . A meteorological radar (R1) provides, with a given radar periodicity, a radar image representing rain-bearing cells of concern to the area of terrain. By analyzing the succession of radar images, the main rain-bearing cells are tracked dynamically by their shape and motion. Then a radar rainfall measurement chart is compiled by accumulating, in each pixel of the area of terrain, the precipitations due, during a second chosen time interval, to these main rain-bearing cells, with interpolation of their shapes and positions. At least one sub-array (PA, PB) of four rain gauges separated from one another by about 2 to 4 kilometers and affected by at least one main rain-bearing cell is selected. Finally, the rainfall measurement chart is corrected at least partially as a function of the relation between the accumulated true rainfall data and those from the said chart at the locations of the rain gauges of the sub-array. This allows excellent estimation of the precipitations in each square kilometer of the area of terrain. [A3319]

"Rainfall detection"

A method of obtaining oceanographic and meteorological data from high frequency radar spectral information comprising the steps of transmitting a plurality of signals to a remote location, recording signals backscattered from the said location, generating a family of Doppler cluter spectra from the recorded backscattered signals and analysing the Doppler clutter spectra in terms of a model or models to detect the presence of rainfall. The model or models identify the presence of rainfall by detecting a reduced amplitude in some parts of the Doppler spectrum, especially in the "wings" of the spectrum by which is meant the regions where the magnitude of the Doppler shift is greatest. The method may also be used by detecting opportunity signals scattered from a remote location. [A3320]

"Metallic cable-locating apparatus and method having an image capturing means"

A probe (10) for locating a buried cable (12) includes a casing (16) adapted to be driven into the earth (14) . Situated in the casing is an RF receiver (23) for sensing RF energy radiated by the cable to establish the cable's approximate location. The casing also has a viewing window (19) in its lower tip (18) in optical communication with a television camera (30) . The camera allows the cable, once its approximate location is established by the RF receiver, to be visually identified. [A3321]

"System for targeted braking of vehicles"

A system for identifying momentary location and the momentary velocity of, in particular, a rail-bound vehicle, has a transmission/evaluation unit having an antenna for emitting a high-frequency pulse and for receiving a reflected pulse reply signal. Surface wave identification marks having individual coding are arranged at intervals from one another in an area of and along a prescribed travel path of the vehicle. The mutual phase shift of at least two pulse reply signals can be measured as a Doppler shift and the travel velocity can be calculated therefrom via the relative velocity with pulse interrogations of an identification mark following one another at least twice at a predetermined location before/after traversing a specific identification mark. The point in time change in operational sign of the Doppler shift is acquired for this identification mark, and is the point in time of traversal of the location of the specific identification mark. [A3322]

"System and method for initiating communications between a controller and a selected subset of multiple transponders in a common RF field"

A system and method for initiating communication between a controller and a selected one or other subset of multiple transponders in a common RF field in which each transponder has a unique, (or commonly unique) preprogrammed ID number. The controller transmits a series of commands/questions to the transponders and they either respond, or do not respond, to the controller based on their ID number, with the non-responding transponders entering a reset state. The transponders respond to the controller in such a way that, if multiple transponders respond, the controller can recognize that at least one transponder has responded and, for individual responses, the controller is not required to determine how many transponders have responded. Through use of the communications system and method disclosed, a sequence of controller commands and transponder responses single out a selected individual transponder or group of transponders based upon its particular ID number. [A3323]

"Vector neural networks"

A vector neural network (VNN) of interconnected neurons is provided in transition mappings of potential targets wherein the threshold (energy) of a single frame does not provide adequate information (energy) to declare a target position. The VNN enhances the signal-to-noise ratio (SNR) by integrating target energy over multiple frames including the steps of postulating massive numbers of target tracks (the hypotheses) , propagating these target tracks over multiple frames, and accommodating different velocity targets by pixel quantization. The VNN then defers thresholding to subsequent target stages when higher SNR's are prevalent so that the loss of target information is minimized, and the VNN can declare both target location and velocity. The VNN can further include target maneuver detection by a process of energy balancing hypotheses. [A3324]

"Radar obstacle detection system with self test"

A radar system which detects the presence of objects in the proximity of a movable vehicle includes a signal source which generates object detection signals, a first antenna which transmits the object detection signals and receives the object detection signals as reflected signals reflected from an object in the proximity of the movable vehicle. The first antenna is further operable for receiving non-reflected test signals. A second antenna is provided for transmitting test signals which correspond to a delayed portion of the object detection signal generated by the signal source. A control unit is responsive to the reception of the reflected signals for providing an indication of the detection of the object, and is responsive to the reception of the test signals for providing an indication of the operability of the system. [A3325]

"Warning apparatus for a vehicle"

A warning apparatus for a vehicle generates a warning for a driver of the vehicle when the separation between the vehicle and an obstacle located in front of the vehicle falls below a prescribed value. The prescribed value is varied in accordance with changes in the physical or mental state of the driver of the vehicle, environmental conditions, or the driving characteristics of the driver and thereby adjust to changes in the driver's reaction time and the stopping distance of the vehicle. [A3326]

"Cylindrical phased array antenna system to produce wide-open coverage of a wide angular sector with high directive gain and moderate capability to resolve multiple signals"

A cylindrical phased array antenna system capable of scanning at rates faster than the information rate of signals being received so that no information is lost by the scanning process. The array is configured to add the capability to provide multidimensional separation of multiple signals and to eliminate the sensitivity loss due to sampling. The cylindrical phased array is comprised of the means to decompose the distribution of current on the radiator elements caused by wave incidence into component signals which are the Fourier spatial harmonics of the distribution, heterodyne means to differentially phase shift these component signals at rates exceeding 4 .pi. radians per cycle of the highest frequency present in the information content of the incident wave, and means to form multiple complex-weighted sums (beams) of the component signals. The means for beam summation selectively forms a coherent sum at only one of its multiplicity of output ports, the particular port being a periodic function of the signal frequency. The ambiguities which arise in frequency measurement capabilities due to the periodicity are resolved by auxiliary means for coarse frequency measurement. [A3327]

"Method and apparatus for automatically dimming motor vehicle headlights using radar signal"

The intensity of the headlights of a motor vehicle are modulated in response to pulsed Doppler radar signals which are used to distinguish between moving vehicles and other objects. The radar signals scan an area generally in front of the host vehicle. Reflected radar signals are received and radar return signals representative thereof are generated. A time to frequency domain transform, preferably a fast Fourier transform, is performed on the radar return signals to produce radar frequency signals. An adaptive technique is used to identify portions of the radar frequency signals produced by reflections from significant objects. The Doppler effect is used to determine the velocity of detected objects to the host vehicle. Any difference between the relative velocity of a detected object and the velocity of the host vehicle indicates that the object is moving. The velocity of the host vehicle may be determined by a conventional speed sensor or by means of radar signals reflected from a stationary object. Distance between the vehicle and a moving object is determined from the travel time of radar signals reflected from the moving object. The headlights of the host vehicle are modulated when a moving object is a predetermined distance from the host vehicle. [A3328]

"Doppler-effect vehicle speed sensor using different speed determining rules depending upon receiver output"

A Doppler-effect speed detecting apparatus for detecting a ground speed of a motor vehicle, including a transmitter, a receiver for receiving a portion of a wave transmitted by the transmitter and reflected by a road surface, a circuit for detecting an output level of the receiver, and a ground-speed determining device for determining the vehicle ground speed, on the basis of the frequencies of the transmitted and received waves, according to a predetermined first rule when the output level of said receiver is higher than a predetermined threshold value, and according to a predetermined second rule different from the first rule when the output level is not higher than the threshold value. [A3329]

"Apparatus and method for ionospheric mapping"

This invention is a unique single-site method of determining the local total electron content (TEC) of the ionosphere and its space-time variation using a global positioning system (GPS) ionospheric receiver. The TEC of the ionosphere is specified in terms of a space-time map of the local TEC in the vicinity of the receiver. Differential group and phase path data between two L-band frequencies (L1 and L2) for a plurality of the GPS satellites in view of the receiver station are analyzed by a least squares technique to extract both the ten parameters of a full second order space-time polynomial expansion for the vertical TEC (VTEC) and the differential delay biases associated with the space vehicles (SVs) . The method is applicable to day and nighttime data. [A3330]

"Operating delay means for a hydraulic door closer"

A door closure delay system produces a first signal when a person approaches a doorway housing the door. The first signal is applied to a timing system and a voltage comparator so that a second signal is produced to limit closure of an open door. The second signal is maintained for a predetermined and adjustable time period after the first signal has been removed. More patricularly, a voltage regulator provides a base or reference voltage to the comparator. A sensor, monitoring the doorway or portal, provides a signal voltage to the comparator when a physical presence is in, or in proximity to the doorway. The comparator passes on an output voltage which is stretched (i.e., has its time line extended) to circuitry coupled to a door closer, to delay the closure of the door by the closer. [A3331]

"Open loop proximity detector"

An open loop proximity detector is contemplated which receives a Doppler frequency when a target is first detected, and predicts a specific fuzing Doppler frequency. The detector continues to transmit and receive electromagnetic waves and sends a detonating signal to the fuze when the predicted fuzing Doppler frequency is received by the detector. The Doppler frequency of the first, or front surface in a forward moving direction of the target is received and is used to detonate the fuze. Thus the ideal surface of the target, the front surface, detonates the fuze and Doppler frequencies from other surfaces of the target are not allowed to interfere with the detonating process. [A3332]

"Process and system for determining the position and orientation of a vehicle, and applications"

The present invention relates to a process and a system for determining the position and orientation of a mobile, and to applications thereof. In order to ascertain both the position and orientation of a mobile, the invention proposes an interrogation/response process whose particular feature is to supply, to a given interrogation, two responses which are distinguished on the one hand, by different modulating frequencies and, on the other hand, by the fact that they are transmitted according to two patterns which differ in aim relative to one another. It is then possible, simply by measuring the angular deviation of either one of the two responses, and simply by measuring the ratio of the amplitudes of the two responses received, to deduce on the one hand the angular position .phi. and on the other hand the orientation .theta. of the mobile. The applications in the automobile sector are numerous (anticollision, control of road traffic and of compliance with the highway code, automatic toll points, etc.) . [A3333]

"Detection method and system"

The invention provides a method and a system for the detection of an object moving relative to another object. The object possibly being a person, an element, an installation, a tool, a surface, etc. According to the invention, a UHF wave is generated in a slotted antenna and the rays exiting from the slots are directed onto the area to be monitored. The reflected waves are detected and this frequency is compared with the frequency of the transmitted waves. [A3334]

"Sensor arrangement for sensing a threat"

A sensor arrangement for the sensing, through the intermediary of the intermediary of high-frequency of an actual threat against an object which is equipped with a receiver device by an attacker penetrating into a radio link. The arrangement has the receiver device designed for the receiving or pickup of radio reception links from a plurality of satellites operating at the same or different frequencies, and which includes at least one comparator stage for the evaluation of the radio reception link which has been influenced by a penetrating potential attacker in comparison with an uninfluenced radio reception link. [A3335]

"Method, apparatus and system for transmitting and receiving data in a moving linear chain"

A method, apparatus, and system for transmitting and receiving an electromagnetic data signal in a moving, linear chain. Each unit in a chain of units has a processing unit interconnecting a directional receiving element, a directional low power transmitting element, a deceleration detector for the unit, and a deceleration detector for preceding units in the chain. In a simple form, motor vehicles are the units. If the invention detects deceleration of a preceding vehicle, deceleration of itself, or an identifiable signal from a preceding vehicle such as a blue light, it causes a rearward facing blue light to illuminate. This blue light indicates to following motorists that the perceived vehicle is decelerating or that a vehicle somewhere in front from of it is decelerating. The blue light also may be received by another vehicle equipped with the invention and consequently be transmitted rearwardly. In a general form, a data encoded high frequency signal is transmitted rearwardly from a vehicle. This signal contains information relating to deceleration of any preceding vehicles (Chain Brake) and of the transmitting vehicle (Brake) . A receiving vehicle analyzes and displays this data to provide a motorist with information regarding preceding vehicles that may or may not be seen by the motorist. In a complex form, a variety of data is transmitted and received bi-directionally throughout the chain. [A3336]

"Apparatus with a signal receiving unit for locating golf balls"

The invention relates to a device with a signal receiving unit for locating golf balls. Each golf ball is associated with a transmitting unit and the signals emitted by each transmitting unit are detected by the signal receiving unit. The transmitting unit is associated with an energy store as an operating voltage source. The device includes a charging circuit with an energy transmitter for wireless transmission of the electrical energy to an energy receiver connected in front of the energy store. Immediately after the charging phase of the energy store, the transmitting unit starts sending transmission signals and in so doing discharges the energy store. The transmitted signals received by the signal receiving unit are fed to an evaluation circuit which produces an output signal for locating the golf ball. This output signal is then fed to a display unit. After a certain discharge time, the transmitting unit stops transmitting the transmission signals. The golf ball is located only during this limited transmission time. Golf balls which have been mishit can be located rapidly and simply using the device. [A3337]

"Method for tracking a maneuvering target with a slow scan rate sensor"

When the scan interval or time between successive potential detections is long with respect to a potential target's maneuvering capability (say on the order of ten seconds for a radar system) , there is the possibility that the target may be able to deviate far enough away from its last detected position at scan i-1 that correlation of the target with a detection in scan i may not be possible using conventional tracking methods. The present invention uses a maneuvering gate to monitor a volume in space. The volume is bounded by intersecting ellipsoids and is disposed, preferably uniformly about the target's last estimate velocity vector. The surfaces of the ellipsoids which bound the volume may be determined by determining the loci of a combination of a straight and turning maneuver at a predetermined acceleration, which acceleration may be selected to be the maximum acceleration expected to be achievable by a predetermined target. When target correlation is disturbed or lost, the volume is examined. A detection in the volume is correlated to the target. [A3338]

"Closed-loop control for scanning application"

An error-free tracking system is disclosed which can operate with a scanning sensor. Beginning with an initialized trajectory for an object, predictions are made with respect to future object position and the sensor produces an error signal representing an error between sensor position (predicted target position) and actual target position at the measurement time. From a sequence of error signals, trend information is extracted and, on the basis of the trend information, the gain of a trajectory correction algorithm is adjusted. Based on the corrected trajectory, a new position estimate is determined. This further estimate is then used for another measurement to produce a further error signal in order to provide for tracking the object or target. [A3339]

"High frequency MTI radar"

An MTI radar based on a comparison of the Doppler shifts of the original signal and a phase-reversed signal using pulse compression wherein the received signal is phase detected for in-phase and quadrature components relative to the IF. A Doppler-corrected pulse compressor produces a magnitude signal for the Doppler shift of the received signal from the sequence of in-phase and quadrature components. Another Doppler-corrected pulse compressor produces a magnitude signal for the Doppler shift of the received signal from the conjugates of the sequence of in-phase and quadrature components. The magnitude signal of the same Doppler shift of the two compressors are compared and the difference is the output of the MTI. [A3340]

"Microwave object counter and method"

A microwave signal is generated from a fixed source across a fixed path to trigger individual FM transmitters in passing objects such as race vehicles. A vehicle transceiver then sends an omnidirectional specific frequency FM radio carrier signal with a tone imposed to a console and a portable remote receiver. As the FM signal and tone are detected and decoded by the console receiver, data word is sent to a scoring computer which displays the lap of that particular vehicle and the current order of all vehicles. [A3341]

"Automatic brake control system"

An automatic brake control system produces a warning before automatically making the braking action of a driving vehicle according to the velocities of the driving vehicle and the vehicle ahead. The system calculates the desired vehicle distance according to the velocities of the driving vehicle and the vehicle ahead, and sets a warning distance which is longer than the desired vehicle distance. The warning distance is set in accordance with the driver's feeling. According to the present invention, the system is prevented from producing undesirable warning. [A3342]

"Method for the discriminating of obstacles by means of radar, and applications"

Disclosed is a method for the discriminating of obstacles by means of a radar, and its different applications to the measurement of a liquid in a tank or vessel, or again to the elimination of unwanted or parasitic echos coming notably from the ground, for radars mounted on vehicles or controlling vehicle traffic. To implement the method, the obstacle to be discriminated must have a substantially plane surface. The disclosed method then consists in successively transmitting substantially plane waves at slightly different angular frequencies .omega..sub.i, each wave being furthermore sent with two different polarizations p and p' chosen in such a way that these different coefficients of reflection on the obstacles according to the incidence of the waves give a criterion of discrimination. The processing at reception depends on the use (measurement of distance, elimination of parasitic echos etc.) . The main promising feature of the invention lies in the fact that it is possible to make very precise measurements without placing excessive constraints on the transmission pattern of the radar. [A3343]

"System for evaluating the inner medium characteristics of non-metallic materials"

A pulse radar system for determining the subsurface structure of a medium comprising an electronics unit for providing electronic signals and control comprising a utility controller, a sampler controller, and a timing controller such that the timing controller provides a pulser trigger and the sampler controller provides a sampler trigger, a microwave unit comprising all the microwave components within the system including a pulser for generating pulses as directed by the timing controller in the electronics unit, a transmitting antenna for receiving the pulses directly from and being in close proximity to the pulser, a receiving antenna for accepting the pulses emitted from the transmitting antenna, and a receiver in close proximity to and for accepting the pulses from the receiving antenna, and a data unit for receiving signals from the electronics unit and for displaying the data for review and analysis. In accordance with another embodiment of the present invention, a method is provided for determining the characteristics of a medium. Also provided in the present invention is a pulser which utilizes all microwave components and a novel antenna assembly. [A3344]

"Location of missing vehicles"

Method and apparatus for determining the present location of a missing vehicle, such as an automobile or marine vessel, using a Global Positioning System that receives GPS signals from two or more GPS satellites. A GPS antenna, GPS signal receiver/processor, a paging responder, a cellular telephone and associated antenna, and a controller/modem are installed in a vehicle and electrically connected together. When the vehicle is determined to be missing, because the vehicle has been misplaced, lost or stolen, the vehicle owner or operator contacts a vehicle location service center, which broadcasts a paging request that is received by the paging responder on the vehicle. The paging responder causes the controller/modem to interrogate the GPS receiver/processor to determine the present location of the vehicle. The receiver/processor determines the present vehicle location and notifies the controller/modem of such location. The controller/modem then causes the cellular telephone to notify the vehicle location service center of the present location of the missing vehicle so that the vehicle can be recovered. The GPS signal receiver/processor and GPS antenna can be replaced by a receiver/processor and associated antenna that works with a LORAN system, or with a group of gyroscopes or local magnetic field sensors mounted on the vehicle. Optionally, the signal receiver/processor is kept in a "sleeper" mode to conserve power, until the controller/modem receives a paging request for its present location. Optionally, the receiver/processor is periodically activated to determine, and thus update, its present location. Optionally, the presence of the GPS antenna and/or the cellular telephone antenna on the vehicle is concealed. In another embodiment, a sensor is positioned on the vehicle, and the cellular telephone is caused to transmit to the vehicle location center a message containing information on the present location of the vehicle when the sensor senses occurrence of a selected trigger event, such as unauthorized movement of, or breaking into, the vehicle. [A3345]

"Vehicle anti-theft alarm system"

A vehicle anti-theft alarm system comprises a microwave transmitter and receiver for transmitting microwave frequency signals from one location in the vehicle against a target in the vehicle at a given distance from the transmitter-receiver and for receiving the signals reflected back from the target and producing a monitoring signal representative of a time, frequency or distance parameter for sending and receiving the signals. If, for example, an object is interposed in the path of the transmitted signals, the parameter and thus the monitoring signal changes and a control signal is produced for actuating an alarm. A holding circuit provides for the alarm to remain actuated when the article is removed from the path of the transmitted signals. [A3346]

"Device for information transmission"

A device for information transmission, a so-called transponder, for receiving a first microwave signal, modulating and coding, and retransmitting a second microwave signal, having at least one antenna made in microstrip technique is described. The device is characterized primarily in that the antenna has an antenna layer (20) , acting towards a ground plane (21) , the antenna layer and the ground plane essentially equal area, and in that the device further having a reflex position (23) , arranged next to or at a distance of at most 1/6 of the air wave length of the first microwave signal from the edges of the antenna layer and the ground plane, so that an antenna lobe directional from the antenna is obtained, including directly transmitted microwave signal and reflected microwave signal. With this embodiment a device is obtained that is compact, effective, light and inexpensive and gives well defined and directional antenna lobe for communications with good range. [A3347]

"Bistatic multiple-doppler radar network"

A multiple-Doppler radar network can be constructed using only one, traditional, transmitting pencil-beam radar and one or more passive, non-transmitting receiving sites. Radiation scattered from the pencil beam of the transmitting radar as it penetrates weather targets can be detected at the receive-only sites as well as at the transmitter. In a bistatic system, the location of targets in Cartesian space can be calculated from the pointing angle of the transmitting antenna and the time between transmission of a radar pulse from the transmitter and detection at a passive receiver site. [A3348]

"Method and apparatus for displaying the impending danger due to speed associated with the driving situation of a vehicle"

A method for displaying the impending danger due to speed associated with the driving situation of a vehicle and a display appliance for carrying out the method are described. In accordance with the method, a degree of danger is defined and calculated and displayed to the driver of a vehicle and, in fact, independently of whether the vehicle, as following vehicle, is driving too close to a vehicle in front or other obstacle (distance problem) or is driving too fast in fog (visual range problem) . The signals necessary for this purpose are obtained from vehicle environment sensors, for example from a distance warning radar or distance recording radar and an infrared visual range measuring system, and are analyzed, together with vehicle condition signals, by a safety computer. On the basis of its specific programming, this computer determines and/or decides, for the respective current driving condition, which of the two degrees of danger is instantaneously predominant and indicates the condition which is respectively more critical to safety on a display. The display, as an indicating appliance, is produced in such a way that it makes it possible to recognize, in symbolic proportion, both the degree of difference between the instantaneous speed and the speed which is currently still safe and the current measure of the danger or freedom from danger in the manner of an analog display which reproduces trends. [A3349]

"Rainfall, snowfall forecast apparatus and method"

An apparatus is presented for providing a short time range forecast with relative high accuracy from weather radar images of cloud reflection data by incorporating physical properties of cloud in the forecasting method. The method consists of defining a plurality of lattice points on a radar image, and multiplying the reflection data from a group of neighboring lattice points obtained at a specific past point in time with selected coefficients. The products of multiplication are summed, and transformed into image data by specific function based on the properties relating to cloud. Squared errors of the difference between the computational reflection data and the observed reflection data are iterated to a value below a predetermined threshold value to select the coefficients, and these coefficients are used to provide forecasting of reflection data at a specific future point in time. [A3350]

"Method and system for tracking multiple regional objects"

A method for tracking objects is disclosed. First a region containing the objects is scanned to generate a multiplicity of sequential images or data sets of the region. A plurality of points in each of the images or data sets corresponds to a respective plurality of the objects. Next, respective figures of merit are determined for assigning the points to the tracks. Next, a k-dimensional cost function is defined which sums the figures of merit for combinations of assignments from the images or data sets. Next, the complexity of the cost function is reduced by Lagrangian Relaxation by permitting a point to be assigned to more than one track and adding a penalty factor to the cost function when a point is assigned to more than one track. The reducing step is iteratively repeated and the resultant penalized cost function is solved. Next, an auxiliary function at a (k-1) -dimension is defined as a function of lower order penalty factors and a solution at the dimension at which the penalized cost function was solved directly. Next, a gradient of the auxiliary function is determined, a step is made in the direction of the gradient to identify a peak region of the auxiliary function and penalty factors at the peak region are determined. The penalty factors at the peak region are used to determine track assignments for the points in the images or data sets. Then one or more of the following actions are taken based on the track assignments: sending a warning to aircraft or a ground or sea facility, controlling air traffic, controlling anti-aircraft or anti-missile equipment, taking evasive action, working on one of the objects. [A3351]

"Object location process and apparatus"

Methods and apparatus for the determination of the location of a mobile vehicle relative to a radio transceiver. The apparatus incorporates a mobile transceiver that calculates its location relative to at least a first stationary transceiver, and communicates this location back to the stationary transceiver. As a mobile vehicle enters the radio field radiated from at least a first stationary transceiver unit, the mobile vehicle transceiver begins measuring the energy of one or more radiated signals as an analog value, converts the analog value to digital form, from which a microprocessor and software algorithm calculates the specific distance from the stationary transceiver, and then returns a data string that informs the stationary transceiver of its location. This system thus allows both the mobile transceiver and the stationary transceiver unit to gain specific information with regard to the relative distance between mobile and base station units. [A3352]

"Carrier locating system"

A system for locating any mobile body or a plurality thereof within a predetermined environment, wherein each mobile body carries a transmitter (10 to 18) , each transmitter producing a unique identifying signal, and a plurality of receivers (20 to 32) located in a corresponding plurality of defined regions in the environment, each receiver incorporating a FIFO controller for interrogating the receiver means in turn to link the identification data with location data. [A3353]

"System for the calculation of at least one vehicular traffic check parameter"

This invention comprises a system for calculating at least one vehicular traffic check parameter. The system according to the invention includes a pulse modulated radar placed at a high point at the side of the lanes to be monitored. The radar emits pulses having a frequency f.sub.o and width .tau. according to a radiation diagram. The radiation diagram is narrow in plan and sufficiently wide in elevation to cover all lanes to be monitored, and inclined in elevation and plan such that at least one range bin of the radar is included in a lane. Echo signals received by the radar are then processed by a signal processing module and a parameter extraction module. The invention is particularly useful in automobile traffic, for calculation of the number of vehicles travelling in lanes, the vehicles speed and length, etc. The advantage of the this inventive system compared with previous systems is that it enables simultaneous checking of several traffic lanes. [A3354]

"Detection of radar targets using higher-order statistics"

A signal detection system, preferably for use with a coherent radar system elects certain combination of input signal samples in a block of signal samples to derive a test statistic which is unbiased by Gaussian noise. Products of pairs of sample values are stored in a data sample look-up table. An index look-up table is created by scanning through possible combinations of addresses and excluding those combinations of sample values which would be redundant over other combination and would result in a contribution to biasing by noise. Pairs of addresses from the index look-up table are then used in sequence to access first and second products from the data sample look-up table. The first product is multiplied by the complex conjugate of the second product and the (quadruple product) result is averaged to form a test statistic which is insensitive to position and constant velocity. Detection of the signal is determined by testing the real part of the averaged test statistic against a threshold. To allow such detection for an accelerating target, a lag index is derived for each combination of addresses in the index look-up table and the accumulation and averaging is done while sorting in accordance with the lag index. Dynamic adjustment of the test statistic compensates for time-varying clutter such as ocean waves, and allow the signal detector to track a substantially constant false alarm rate. [A3355]

"Monopulse azimuth radar system for automotive vehicle tracking"

A monopulse vehicular radar system for tracking a target about an automotive vehicle senses a transmitted signal reflected back from the target and received at two different locations, determines the sum and the difference of the reflected signals sensed at the two locations, and compares the sum and difference to determine the deviation of the target from a reference azimuth. A source frequency provided by a Gunn diode is applied to and transmitted by a two-lobe monopulse antenna. The antenna lobes detect the reflected signals from the target by sensing them at the two different lobes. A hybrid junction provides sum and difference signals to mixers which homodyne the signals to produce sum and difference Doppler frequency signals using the source frequency. The Doppler frequency signals are amplified and then compared to determine the deviation of the target from the reference azimuth. The comparison process can be done digitally by converting the amplified frequency signals to digital signals which are then processed in a digital signal processor, or the comparison may be done in analog fashion using a phase/quotient detector. The range or distance of the target is determined by shifting the source frequency between two frequencies during transmission and frequency shifting the sum and difference Doppler frequency signals in similar fashion following reception by the antenna. [A3356]

"Method and apparatus for controlling the speed of a vehicle and its spacing from a preceding vehicle"

An automatic speed and distance control apparatus responsive to detected signals and operator induced signals for automatically controlling the speed of an automotive vehicle and its distance with respect to objects in its path of movement. A flexible control scheme is provided, which permits a driver to intervene in the operation of the system when he or she wishes to accelerate in preparation for a passing maneuver. Upon interruption of the operation by a vehicle driver, the control apparatus is interrupted for a predetermined period of time and thereafter resuming automatic control function. [A3357]

"Digital phase lock detector"

A digital phase lock detector for determining the periods of an incoming signal for use in measuring rapidly and accurately the relative speed or velocity of vehicles according to the Doppler-radar principle includes a micro-controller based processor unit operated under a stored program to perform period determination. A bandpass filter is provided for generating a periodic signal which has a frequency which is varied in accordance with the velocity of the target vehicle in response to a difference Doppler signal. A comparator is responsive to the periodic signal for generating a rectangular pulse signal which is a digital representation of the periodic signal. The processor unit includes a microprocessor for determining the period of the pulse signal by integrating a number of consecutive cycles to produce a synthesized Doppler frequency signal having a frequency which is proportional to the velocity of the target vehicle. The bandpass filter is responsive to the synthesized Doppler frequency signal for varying the center frequency thereof to track the difference Doppler signal. [A3358]

"Doppler control channel for a radar"

A Doppler control circuit for a CW or pulse Doppler radar system for monitoring not only the phase shift between echo signals from several targets but also the amplitude difference between the several targets and to further tune the radar to a particular target among one or more targets from which echo signals return. The control circuit can be used in state of the art CW or pulse Doppler type radar systems. In a further system, a special circuit is provided for conditioning selected portions of the Doppler frequency spectrum to attenuate or de-emphasize portions of the echo signal corresponding to selected targets in the radar system environment, such as rain or stationary wayside objects, in order to give such echo signals less weight in determining roadway hazards. [A3359]

"Airport surface vehicle identification system and method"

An airport vehicle identification system for improving airport traffic management and collision avoidance, includes a ground surveillance radar and a plurality of low power frequency translators located in spaced relationship about the surface of the airport. The radar system transmits a conventional radar signal for target detection and a beacon interrogation signal for target detection. Each translator is designed to bandshift the interrogation signal to a frequency value compatible with the vehicle transponder, and transmit the bandshifted interrogation signal to the vehicle transponder. Each frequency translator is bi-directional and receives a transponder reply signal indicative of vehicle identity and bandshifts the reply signal to a frequency value compatible with the ground surveillance radar and transmits the bandshifted reply signal to the ground radar. This invention fills the critical void in airport traffic control of providing ground controllers with electronic airport ground surveillance data which includes both vehicle position and identity. [A3360]

"Detection and mapping of hydrocarbon reservoirs with radar waves"

Radar is used to detect and map near-surface geochemical alteration of rock and soil. The radar waves penetrate a buildup of carbonate and silica on the earth surface above micro-seepage of hydrocarbons dissolved in water. The hydrocarbon source may be an oil or gas reservoir buried many thousands of feet, or it may be from near-surface, man-made features. The thickness and sensitivity of the buildup is related to the size of the underground source or reservoir. Radar echoes from the bottom of the buildup provide a reservoir detection and mapping tool. [A3361]

"Metal recovery device"

A device for electrolytically recovering metal, in particular silver, from a photographic processing solution, said device having an anode located in a recovery chamber and a movably arranged cathode as well as a scraper for removing metal, in particular silver, deposited on said cathode. for the purpose of electrolytically depositing metal (17) , cathode (12, 32, 42) is held stationary in its operating position within the solution (16) . for removal of the metal, the metal-loaded cathode (12,32, 42) is moved out of its operating position within the solution (16) and is brought into engagement with the scraper (14, 20, 34, 44) arranged outside the solution (16) . Subsequently, the cathode (12,32, 42) freed from metal (17) returns to its operating position within the solution (16) for a repeated electrolytic deposition of metal (17) . [A3362]

"Weather radar axonometric display mode implementation"

A horizontal plan view and a vertical side view of a weather disturbance are combined into a single axonometric display to facilitate analysis of the disturbance. Desired azimuth and elevation angles for the center of the axonometric display and which of the four quadrants of the display to be emphasized are user selectable. Either the plan view or the side view can be separately displayed in the axonometric format and the axonometric display is user selectable with the conventional display being readily available. [A3363]

"Multiple target discrimination"

A target tracking system (10) comprises sensors (12) which provide data corresponding to a region of interest, the data being time dependent and consisting of amplitudes, ranges and angles. A window (202) is placed around data of interest, the size of the window being determined based on target size, assumed speed and acceleration characteristic, and the window is thereafter broken down into a plurality of smaller windows (208) , thereby forming a grid having a nodal point (210) at each corner of the smaller windows. The data within the window is stored in a matrix, and background noise is thereafter minimized by filtering the data past a threshold value (215) . The filtered data is analyzed to determine its distance weighted contribution at each nodal point (219) , and the weighted distances are summed for each nodal point resulting in a nodal point magnitude for each of the nodal points (220) . A nodal point having the maximum magnitude is selected (221) and its magnitude is compared to a target threshold value (227) . A first target is determined to be present if the nodal point magnitude is greater than the target threshold value. The weighted contribution of the nodal data corresponding to the first target is removed from the nodal point magnitude for each of the nodal points (230-237) , and thereafter, the procedure is repeated until all targets have been identified and deleted (221-237) . [A3364]

"Electronic car bumper"

A plurality of sensitive high-frequency proximity switches are provided in the bumper of a car and obstacles can be accurately identified. The electronic car bumper includes: a plurality of sensor portions each having sensor plates, first loading coils, and a divided capacitor, and a reference resonance circuit having a reference capacitor, a second loading coil and a divided capacitor. An oscillator drives each of the sensor portions and the reference resonance circuit through switching devices, and a detector detects an output of the oscillator. A discrimination portion discriminates an output of the detector and provides a discriminated signal to an output portion corresponding to the sensors and the reference resonance circuit. A synchronous device switches the switching device and the discriminator portion in synchronization. A direct current amplifier has an output which is adjusted to a point at zero as a reference voltage for the output corresponding to the reference resonance circuit, and a comparator is adjusted to a threshold reference according to the reference voltage. [A3365]

"Apparatus and method for estimating weather spectral moments"

A spectral moment estimator includes a first processor which processes signals representative of the magnitudes of complex autocorrelation functions of a signal at a plurality lags and provides Doppler spectral width representative signals and the autocorrelation function at zero lag independent of noise. A second processor, processes the complex autocorrelation representative signals, the complex autocorrelation functions phase angles representative signals, and the Doppler spectral width representative signals to provide the mean Doppler frequency of the the signal. The autocorrelation function phase angles are disambiguated and the unambiguous phase angles are least mean square error fitted to a third order odd polynomial, the linear term of which is the mean Doppler frequency of the signal. [A3366]

"Device for positioning a first object relative to a second object"

A device for positioning a first object relative to a second object, primarily for positioning an automatic fuelling device relative to vehicles. A transponder using a microstrip antenna design is small in dimension and gives accurate position indication by attachment to a back surface of a body which acts as a close reflection plane. The preferred embodiment of the device is a microstrip patch antenna where the ground plane is of similar size as the antenna element, and where the transponder is mounted on a car body rearward of the fuel filling point, to result in a radiation diagram that is created from the added direct signal from the antenna element and the reflected signal from the car body. A rounded profile of the transponder is a result of placement of its battery adjacent to the radiating element. [A3367]

"Weather radar system including an automatic step scan mode"

A weather radar system is operable in an automatic mode for positioning the radar system antenna beam to scan an elevation axis between upper and lower scan limits in incremental steps as selected by a user while continuously scanning an azimuth axis for enhancing the analysis of weather conditions. [A3368]

"Image processor for target detection and tracking"

An image processor for use in detecting and tracking a plurality of targets is provided including a plurality of memory locations for storing intensity images and a signal processor coupled to the memory locations. The signal processor comprises a closed loop feedback system for producing a plurality of intensity images for updating externally derived reference intensity images in response to at least one externally derived data image incorporating target detection signals. [A3369]

"Automotive navigation system and method"

A navigation system for a vehicle travelling along a highway that has an interrogator mounted on the vehicle and, a retrodirective transponder mounted alongside the highway for updating vehicle location. for collision avoidance systems, interrogators transmit and receive fore and aft, and transponders are mounted to respond to signals fore and aft of the vehicle. The transponder modulates information onto the interrogation signal, and retransmits the encoded interrogation signal back in the direction of arrival of the collected interrogation signal. The responder uses a Van Atta array antenna and is capable of responding to an interrogator signal incident over a wide solid angle of arrival while retrodirectively retransmitting without amplification substantially all of the collected signal within a narrow solid angle. The responder may be implemented using monolithic microwave integrated circuit technology (MMIC) , thus being suitable for high volume production. [A3370]

"Obstacle detecting device for a vehicle"

An obstacle detecting device for a vehicle comprises a pair of image sensors for taking an image of an object surrounding a vehicle, a display image plane for displaying an image data taken by said pair of image sensors as an image, and a plurality of windows designating regions of said image on said display image plane. The device further comprises an optical obstacle detecting device for detecting distances from said vehicle to said object in said regions of the image designated by said plurality of windows for the respective windows to thereby detect an obstacle, a laser radar device mounted on the vehicle for radiating a radar beam to the object surrounding the vehicle to thereby detect said obstacle, and an obstacle selecting device for selecting either the obstacle detected by said optical obstacle detecting device or the obstacle detected by said laser radar device mounted on the vehicle. [A3371]

"Transponder for proximity identification system"

A transponder for use in an object identification system including an interrogator which transmits a continuous interrogation signal and detects a responsive identification signal transmitted by the transponder. The transponder receives and detects the interrogation signal and, in response to receipt of the interrogation signal, produces a repeating identification signal having a fixed number of binary bits consisting of an identification data portion of a specified number of consecutive bits less than one half of the fixed number of bits, and a synchronization pattern of consecutive bits consisting of first, second and third bits of alternating binary values, a consecutive sequence of a plurality of bits which are all of the same binary value as the second bit, and a single bit of the same binary value as the first and third bits. The identification signal is modulated onto a carrier signal and transmitted. Preferably, the first, second and third bits and the sequence of a plurality of bits constitute one half of the fixed number of binary bits of the identification signal, with the binary value of the first bit being a binary 1. [A3372]

"Ice thickness measurement reflectometer"

The disclosure defined by this invention utilizes electromagnetic energy reflected from the top and bottom surfaces of ice, the thickness of which is being measured, to determine a phase difference that indicates the thickness of the ice. Since there will be many wave lengths of the electromagnetic energy in the ice, two measurement frequencies are utilized. Integers of wavelengths of each frequency are added to the readings for each frequency to derive sets of numbers. The one number in the set of readings for each frequency that are the same in each set indicate the actual thickness of the ice. [A3373]

"Radio environment measuring system"

A radio environment measuring system for measuring a propagation state of radio waves includes: a fixed radio apparatus provided in a base station, a mobile radio apparatus operatively connected to the fixed radio apparatus through the radio waves, the mobile radio apparatus having a repeater unit for receiving a transmission signal from the fixed radio apparatus and sending a returned signal to the fixed radio apparatus, and the fixed radio apparatus having a transmission/reception unit for sending the transmission signal to the mobile radio apparatus and receiving the returned signal from the mobile radio apparatus, and a measuring unit for measuring the propagation state of the radio waves, for example, a propagation distance, direction and reception intensity of the radio waves between the fixed radio apparatus and the mobile radio apparatus based on the transmission signal and the returned signal. [A3374]

"Method for creating a 3-D image of terrain and associated weather"

A weather visualization system retrieves a static terrain map which is merged with dynamic weather information. The dynamic weather information may be provided from weather radar, weather satellite or remote weather observation sites. The terrain map is combined with the weather information to provide a three-dimensional weather image relative to the terrain map. The system can generate a sequence of images to provide a "fly by" animation. Path data can also be input so that a fly by of a projected storm path can be displayed. Other dynamic information can be displayed relative to the terrain map such as the locations of fires and accidents. Weather information which can be displayed includes storms, clouds, rain, snow, hail, tornadoes and severe weather. The system includes time and date information to generate appropriate shadows in the three-dimensional image. [A3375]

"Radar target velocity estimator"

A radar target velocity estimator apparatus and method for computing a radial velocity of radar targets from differences in Doppler frequency shift between pulse-returns of multi-pulse waveforms. The velocity estimator uses Doppler frequency shift which is obtained from a finite impulse response (FIR) filter in combination with logarithm tables stored in read-only-memory (ROMs) to calculate the target's velocity. The estimation process requires the calculation of each complex FIR filter value twice during a pulse repetition interval, once for returns of a leading set of radar pulses and then for a trailing set. The estimated velocity is proportional to the phase difference between each corresponding pair of filter values. The estimate is a function of the arctangent of the quotient of the in-phase component of the complex value divided by the quadrature component. [A3376]

"Vehicle guidance control system"

In accordance with the present invention, an automatic lateral guidance control system for motor vehicles is provided which includes a steering servo actuator which steers the vehicle. The steering servo actuator also allows for manual control by the driver. A detector detects when the automatic control is malfunctioning or is not present, and restores manual control to the driver. The system also includes a provision for stability augmentation to compensate for oversteering or understeering. [A3377]

"Doppler-effect vehicle ground speed detecting apparatus having means for sensing abnormality of detected ground speed"

A Doppler-effect speed detecting apparatus for detecting a ground speed of a vehicle, including a transmitter for transmitting a wave towards the ground surface, a receiver for receiving the wave reflected by the ground surface, and an output device for producing an output indicative of the ground speed according to the frequencies of the transmitted and reflected waves. The apparatus further includes a device for determining presence or absence of abnormality relating to the output of the output device, on the basis of an output level of the receiver as well as a speed difference between the ground speed obtained by the output device and an estimated vehicle speed which is obtained on the basis of rotating speeds of the vehicle wheels. [A3378]

"Phase-coded monopulse MTI"

A pulse-compression, MTI, doppler-radar system for determining target velty information from a single target-return pulse is improved by the addition of a pulse-compression filter consisting of at least two pulse compressors and by the addition of a phase-comparison processor. The pulse compressors simultaneously pulse-compress separate portions of the single target-return pulse. The phase-comparison processor then determines the phase difference between the compressed pulses to obtain the target velocity information. [A3379]

"Signal metric estimator"

A performance measure of an ATR is made from ancillary target data and the ATR output. A parameter of the ATR is varied to determine the change an ATR performance due to the parameter variation. Separate performance in the form of a quadratic equation models provide performance as a function of parameter and metrics. The performance model is partially differentiated with respect to the parameter. The partial differentiation allows solution for the estimated metric. [A3380]

"Dynamic capacity allocation CDMA spread spectrum communications"

A dynamic capacity allocation spread spectrum CDMA communications system for overlaying, at least in part, geographically and in frequency a radio-relay system. A first receiver, located near the relay receiver of the radio-relay system, measures a first power level within the relay bandwidth of the radio-relay system. A second receiver, located near the relay receiver, measures a second power level outside the relay bandwidth of the radio-relay system. The first power level is compared to a predetermined threshold. A ratio signal is generated from the first power level and the second power level. When the first power level exceeds the predetermined threshold, the ratio signal is used to regulate the power level and dynamically allocate the capacity transmitted from each spread-spectrum-base station. [A3381]

"CDMA communications and geolocation system and method"

A spread-specttrm CDMA communications system for locating remote units, and for communicating message data between a plurality of remote units and a base station. The spread-spectrum CDMA communications system includes a plurality of base stations and a plurality of remote units. A base station has a spread-spectrummodulator for spread-spectrum processing the message data, and a transmitter for transmitting the spread-spectrum processed-message data, combined with a generic-chip-code signal, from the base station to a remote unit. The base station also has an antenna, and spread-spectrum detectors for recovering message-data communicated from the remote-units. A remote-unit has an antenna, and a detector coupled to the antenna for recovering data communicated from the base station. The detector includes a spread spectrum demodulator. Also, the remote unit has a device for converting the format of the data into a form suitable for communicating over radio waves, a spread spectrum modulator and a transmitter. The base station has a range circuit, which compares the generic-chip-code signal generated at the base station with the generic-chip-code signal received from the remote unit, for determining a range between the remote unit and the base station. [A3382]

"Communication system and method for determining the location of a transponder unit"

A multilaterating two-way message delivery system for mobile resource management provides efficient two-way radio data communication for multitudes of portable transponders using a single frequency in half-duplex communication. The system includes at least one transponder device which transmits and receives data using a radio frequency communication link, and an array of at least three base stations which communicate with the transponder device using the radio frequency communication link. The radio frequency communication link employed by each base station and the transponder device is designed to provide multilateration information and to deliver message data simultaneously. Further, a control arrangement is coupled to the array of base stations to coordinate the communication between the base stations and the transponder devices. Time-division multiplex and spread spectrum technology is employed by the system for communication efficiency and minimizing the effect of multipath interference. [A3383]

"Electrical device for liquid level measurements in industrial tanks and the like"

An electrical device for measuring the liquid level in industrial tanks and the like with a microwave transmitter and receiver and a waveguide provided with an aperture and an antenna. The signal reflected from the liquid surface and the transmitted signal are fed to a frequency conversion stage (8) , whose low-frequency output signal is sent via an A/D converter (12) to a microprocessor calculating the fill level. To reduce the effect of interference frequencies produced by reflection of microwaves in the optical aperture, etc., a band-pass filter (9,10) with a lower limiting frequency selected to attenuate the low-frequency interference frequencies is placed between the frequency conversion stage (8) and the A/D converter (12) . The lower limiting frequency can either be controlled with microprocessor (13) or the band-pass filter (9, 10) has adjustable limiting frequencies. To inhibit overcontrol of the A/D converter, an amplification stage (11) controlled by microprocessor (13) is provided for band-pass filter (9, 10) . [A3384]

"Quantitative dielectric imaging system"

In a microwave imaging system, a three dimensional profile of the dielectric permittivity of a target is obtained. A transmitter transmits microwaves toward a target, and the target scatters the microwaves. The scattered waves are received by an antenna and are converted into suitable data for application to a digital computer. The computer processes the data using either a scattering matrix algorithm or a Fourier transform algorithm. The computer then generates data representative of a three dimensional profile of dielectric permittivity which can be displayed on a suitable display device such as a CRT. [A3385]

"Ultra-wideband radar motion sensor"

A motion sensor is based on ultra-wideband (UWB) radar. UWB radar range is determined by a pulse-echo interval. for motion detection, the sensors operate by staring at a fixed range and then sensing any change in the averaged radar reflectivity at that range. A sampling gate is opened at a fixed delay after the emission of a transmit pulse. The resultant sampling gate output is averaged over repeated pulses. Changes in the averaged sampling gate output represent changes in the radar reflectivity at a particular range, and thus motion. [A3386]

"Microburst precursor detection utilizing microwave radar"

A microburst precursor detector samples radar returns from meteorological radar signal reflectors and processes the signal returns in a statistical manner to determine average radar reflectivity and to extract Doppler signal parameters. The vertical velocity in still air and the vertical velocity of the meteorological radar reflectors are respectively determined from the average reflectivity and the Doppler signal parameters. The difference between the two vertical velocities is taken to determine the vertical wind velocity. The vertical wind velocity and the average reflectivity are processed to predict the occurrence of a microburst. [A3387]

"Bulk wave transponder"

An electronic article surveillance system including a bulk acoustic wave transponder 10 coupled to an antenna 12, an interrogator 14, directional antenna 16 and an output connector 18. The transponder comprises a silicon or glass substrate 20, bus electrodes 22, 24, a launching IDT T0 and a series of "connected" and "unconnected" IDTs T1-T4. The connected/unconnected state of the respective IDTs T1-T4 may be detected and employed to generate an identification code comprising a series of binary digits. A thin copolymer piezoelectric film 26 covers the substrate 20 and electrodes T0-T4. [A3388]

"System and method for earth probing with deep subsurface penetration using low frequency electromagnetic signals"

An earth probing system uses deep penetration of electromagnetic waves into soil and other media. Advantage is taken of the lower attenuation of radar waves in soil by frequencies of about three megahertz or less. Bursts of electromagnetic energy of various frequencies in this range are consecutively transmitted. The transmitting antenna is continuously tuned, so as to maintain resonance during each burst, allowing large circulating currents and high power output. In a receiving antenna system, a dual antenna arrangement is providing for obtaining improved reception. A corresponding dual antenna circuit employs "spatial notch filtering", automatic adjustment of antenna gain-frequency variations, as well as compensation for transmitter gain variation. The system may be implemented in a totally analog, totally digital, or hybrid manner. Preferably, a signal processing method detects and digitally samples signals reflected from subsurface layers and buried objects. The invention provides means for removing system distortions and interfering signals, for compensating for aliasing errors and frequency-dependent antenna gain and phase variations, and for avoiding masking errors introduced by strong reflections. [A3389]

"Vehicle collision alert system"

An apparatus for deciding an excessive approach of a vehicle to an object in front of the vehicle. The excessive approach decision apparatus comprises a normalized time rate of change detector for determining a normalized time rate of change of a visual angle for the object as viewed from the vehicle. An excessive approach is indicated based upon the determined normalized time rate. [A3390]

"Overlaying spread spectrum CDMA personal communications system"

A spread spectrum CDMA communications system for communicating data and/or digitized voice between a plurality of users to a plurality of PCN units. The spread spectrum communications system is located within a same geographical region as occupied by an existing FDMA, proposed TDMA or any other mobile cellular system. The spread spectrum CDMA communications system includes a plurality of PCN-base stations and a plurality of PCN units. A PCN-base station has a comb filter for notch filtering predetermined channels of the mobile cellular system, a device for converting the format of the data into a form suitable for communicating over radio waves, a spread spectrum modulator for spread spectrum processing the data, and transmitter for transmitting the spread spectrum processed converted data from the PCN-base station to a PCN unit. The PCN-base station also has an antenna, and spread spectrum detectors for recovering data communicated from the PCN units. A PCN unit has an antenna, and a detector coupled to the antenna for recovering data communicated from the PCN-base station. The detector includes a spread spectrum demodulator. Also, the PCN unit has a device for converting the format of the data into a form suitable for communicating over radio waves, a spread spectrum modulator and a transmitter. [A3391]

"Transponder systems for automatic identification purposes"

A method of communicating between an interrogator (10) and at least a first and second transponder (12) . The transponders (12) are separately located within a first and a second vehicle (20) travelling within a first and a second traffic lane, respectively. The method has the steps of providing a first and a second LF antenna (16) associated with and proximity to a first and a second traffic lane, respectively. From each of the first and second LF antennas (16) a continuous LF subcarrier is transmitted to serve as a clock signal for each antenna's associated transponder (12) . Initially, a wake-up signal is sent by each of the LF antennas (16) to its associated transponder (12) . Following the wake-up signal, a unique lane code is sent by each of the LF antennas (16) to its associated transponder (12) . The transponder (12) stores its unique lane code in its memory (70) . The transponder then sends a UHF response in a pre-determined time period depending on the unique lane code stored in each of the transponders (12) . The time period in which the transponder (12) sends its UHF response is unique to that transponder (12) so that interference between responding transponders (12) is avoided. Other devices, systems and methods are also disclosed. [A3392]

"Method and device to determine the passing to a pre-selected distance of a reflector point by

means of the time of propagation of a continuous wave"

The wave is modulated in frequency (or in phase) and a measurement is made of the frequency of the beat between the transmitted wave and the received wave which gives the propagation delay and hence the distance. The method provides for the superimposing, on this modulation, of a periodic over-modulation with a period that is equal to or is a multiple of the propagation delay corresponding to a pre-selected expected distance. The device comprises, at transmission, in the case of a linear modulation of frequency, a saw-tooth generator (31) and a generator of over-modulations (32) , for example sinusoidal, controlled by the expected distance given by a distance selector (30) . The modulation signal of the transmitter is obtained by summation (33) of the signals of the two generators (31, 32) . [A3393]

"Simultaneous data transmission and reception system using microwaves"

A system including a first station (1) known as a beacon and at least one second station (2) known as a badge, each station having a transmission channel with an antenna and a reception channel with an antenna. To allow multiplex exchanges, using simultaneous transmission and reception, the two antennas (6, 11) (13, 15) in any given station are decoupled by cross-polarization but antennas which communicate with each other (6, 13) (11, 15) have compatible polarization. Applications to identification systems using microwave transmission. [A3394]

"Frequency-coded monopulse MTI"

A pulse-compression, MTI, doppler-radar system for determining target velty information from a single, frequency-coded uncompressed target-return pulse includes a coded modulator, two pulse compressors, and a phase-comparison processor. The coded modulator generates for transmission an uncompressed pulse with the first and second halves of the pulse coded with the even and odd harmonic sidebands of a pulse repetition frequency, respectively. The first and second halves of the pulse returning from the target are pulse compressed simultaneously by the two pulse compressors. The phase comparison processor then determines the phase difference between the compressed pulses to obtain the target velocity information. [A3395]

"Hazardous waste transport management system"

A hazardous waste shipment system provides monitoring and control to verify the location and condition of each shipment. Two-way base stations receive status and identification signals from vehicle-mounted transponders as the shipments pass by, and the base stations relay the information to a central data bank. The vehicle mounted transponders may receive data from sensors that monitor the load, and may actuate alarms or a message display for operator intervention. The three-tier system also provides notifications, and safety instructions in the event of a mishap, with the base stations relaying instructions or route changes to the vehicle mounted transponders. [A3396]

"Ultra-wideband receiver"

An ultra-wideband (UWB) receiver utilizes a strobed input line with a sampler connected to an amplifier. In a differential configuration, .+-.UWB inputs are connected to separate antennas or to two halves of a dipole antenna. The two input lines include samplers which are commonly strobed by a gating pulse with a very low duty cycle. In a single ended configuration, only a single strobed input line and sampler is utilized. The samplers integrate, or average, up to 10,000 pulses to achieve high sensitivity and good rejection of uncorrelated signals. [A3397]

"Continuous-wave reflection transmissometer with target discrimination using modulated targets"

The attenuation of electromagnetic waves by a transmission medium is detected or measured by directing a continuous periodic electromagnetic wave toward a reflector. The reflector is modulated to modulate the electromagnetic wave as it is reflected. The reflected wave is received and an output signal related monotonically to the power of the modulated reflected wave is detected. The output signal is then compared to the output signal which is or would be obtained under various other transmission conditions. [A3398]

"Method and means for avoiding collision between a motor vehicle and obstacles"

The method for avoiding collision between a motor vehicle and obstacles placed in the path of the vehicle comprises the stages of forming a radar map of the area in front of the vehicle, reconstructing the geometry of the road, identifying its edges, detecting the position and speed of the vehicle with respect to the road, determining the presumed path of the vehicle on the basis of the road geometry and the manoeuvre being carried out by the vehicle at that instant, detecting objects on the radar map found lying in the presumed path of the motor vehicle and displaying the map found in a perspective representation, ignoring objects which are off the road and indicating objects in the path of the vehicle in a different manner according to their hazard and if appropriate generating alarms of an acoustic type. [A3399]

"Obstacle-detection system"

A method and apparatus for detecting objects around a vehicle, comprising a plurality of microwave-transceiver sensors for transmitting microwave signals to reflect off objects around the vehicle. The reflected signals are received and passed to a control unit for comparing the received signal to a transmitted signal to determine whether a detected object constitutes a threat to the moving vehicle. An alarm means is connected to the control unit and activates upon the receipt of an alarm signal when the control unit determines a detected object constitutes a threat to the vehicle. [A3400]

"Vehicular cruise control system and radar system therefor"

A radar system (30) for determining the range at a future time of a target moving relative to the radar system. The system comprises an R.F. source (56) for providing a signal at a frequency which increases over time from a base frequency f (Hz) at a rate r (Hz/s) for a sweep duration d (s) . This signal is transmitted and a signal reflected by the target is mixed (38) with a portion of the transmitted signal to give a signal having a frequency proportional to the range of the target. The R.F. source is arranged to have a sweep rate r equal to the base frequency f divided by a time t (s) which time is the delay until the target will be at the measured range. A predicted range may thus be derived without complex compensation for relative velocity. The system may further provide velocity feedback without requiring extra circuitry. [A3401]

"Transponder system"

A transponder system comprising an interrogating source of HF electromagnetic radiation, and a plurality of transponders which each include a token reader unit to receive a removable token, e.g., a smart card, including onboard data processing capability. The transponders, or a group of transponders, are each arranged when interrogated to transmit a unique HF response modulated by information taken upon the token. [A3402]

"Structure of reception frequency converting portion in a multi-band microwave detector"

A structure of a reception frequency converting portion of a multi-band microwave detector, and including a microwave circuit comprises a horn antenna, two-port cavity integrally formed with the horn antenna and having one port communicated with a throat portion of the horn antenna, one-port cavity integrally formed with the two-port cavity and communicated with the other port of the two-port cavity, a mixer diode located at the throat portion of the horn antenna, a first local oscillator arranged within the two-port cavity, and a second local oscillator arranged within the one-port cavity. [A3403]

"Vehicle detection systems"

In a vehicle presence detection system for controlling traffic signal lights at a road intersection, the vehicle detection is performed by targeting vehicles at the location of interest with an FMCW radar beam. The radar can be switched repeatedly between the FMCW mode, for vehicle presence detection, and a doppler mode, for vehicle movement detection. Signal data representing the background of the scene viewed by the radar beam are stored for use by circuitry that determines whether an apparent vehicle presence detect is a true vehicle detect, the background signal data is repeatedly updated, as necessary, as the system cycles. Temperature compensation is provided and entry into the FMCW mode is inhibited if a voltage-controlled oscillator provided for generating the emissions has not settled down after any such compensation. [A3404]

"Very low frequency tracking system"

Apparatus identifying an instrumentality such as a person's hand or an article of merchandise, wherein the instrumentality carries a tag incorporating a transponder generating and transmitting a radio frequency identification signal in response to a radio frequency transmitted inquiry, a nest comprising an identifying station and incorporating a proximity sensor sensing the presence of the instrumentality at the identifying station and producing an indication of the presence or absence of the instrumentality, the identifying station comprising a radio frequency sensor portion generating a radio frequency transmitted inquiry transmitted to the transponder in response to sensing the presence of the instrumentality and receiving the radio frequency identification signal from the transponder, the proximity sensor terminating generation of the radio frequency transmitted inquiry when a clear and reliable output indication identifying the tag has been produced, and the proximity sensor also preventing, after producing a clear and reliable output indication, generation of a subsequent radio frequency transmitted inquiry until the proximity sensor has subsequently produced indications of the absence of the instrumentality at the identifying station. [A3405]

"Traffic management system"

A method of and apparatus for providing information which may be used in making traffic management decisions for limited access highways is disclosed. The method and apparatus employs microwave radar to obtain information bearing signals which are processed to determine the vehicle direction and speed. The apparatus includes the capability of emulating in-the-road or on-the-road sensors to provide output pulse pairs which appear as if generated by switch closures. The method and apparatus also has the capability of providing "wake-up" signals commensurate with a predetermined number of consecutive vehicles which pass a preselected point traveling at an abnormally low speed. Because the method and apparatus are vehicle direction sensitive, the capability of monitoring traffic flow by looking across lanes is also present. [A3406]

"Terrain referenced navigation--woods data base model"

A terrain referenced navigation system utilizing a woods database model including a method for increasing terrain referenced navigation accuracy by compensating for the existence of deciduous forests. Deciduous forests present increased terrain referenced navigation inaccuracies during months that trees lack leaves. The terrain referenced navigation database is modified to include a woods bit to indicate the existence of a deciduous forest. The terrain referenced navigation algorithm is modified to account for the existence of the deciduous forest. [A3407]

"Azimuth range velocity display and cursor for use therewith"

A method of displaying and determining the velocity of radar returns of frequency modulated continuous wave radars including the steps of determining a velocity for each radar return from a detected beat frequency associated with received radar returns, and displaying (for successive radar dwells) one or more major plots indicating range, azimuth and velocity of any radar returns. Each major plot is characterized by a velocity axis with a maximum and a minimum display velocity. The major plots are composed of minor plots indicating range, azimuth and velocity of any radar return and are characterized by a velocity axis that extends between zero velocity and the magnitude of greatest possible velocity corresponding to the range of the detected beat frequencies. Between successive radar dwells, radar returns on one side of the said zero velocity remain substantially in the same display position whereas associated radar returns displayed on the other side of the zero velocity do not remain substantially in the same position. Furthermore, classification of radar returns is assisted by displaying the radar returns on a display, displaying predicted radar return positions of a radar return on the display where the prediction of the position of the radar returns is in accordance with radar return azimuth from an antenna and estimates of the heights of the E and F layers. [A3408]

"Airport surface vehicle identification"

An airport vehicle identification system includes a ground surveillance radar system which radiates both a conventional radar signal and a beacon interrogation signal. The radar receives i) a backscatter signal from the skin returns of a target and ii) an encoded ID signal indicative of the target identity. The encoded ID signal is transmitted by a vehicle (e.g., an aircraft) mounted transponder in response to receiving the beacon interrogation signal. The transponder can be located within an external vehicle light housing such as an aircraft collision avoidance light. This invention fills the critical void in airport traffic control of providing ground controllers with electronic airport surface surveillance data which includes both vehicle position and identity. [A3409]

"Method for two dimensional doppler imaging of radar targets"

A method for two dimensional imaging of a two or three dimensional target is disclosed. As shown, a radar transmitter transmits a beam on a beam axis originating at a position spaced from the target and a radar receiver receives return signals from the target. The stationary radar observes the precessing target whose normal to the two dimensional target plane (or whose axis through a three dimensional target) intersects the transmitted beam axis at a point, and forms a cone half angle with the beam axis. With the normal (or target axis) moving along a conical surface while precessing 2 Pi around the beam axis, signal returns from the target are processed to develop a two dimensional image of the target. The process is repeated at other cone half angles and a composite, reduced-sidelobe image generated by vectorial superposition of images at multiple cone half angles. [A3410]

"R.F. transparent RF/UV-IR detector apparatus"

A dual-mode, radio frequency, optical-wavelength detector apparatus includes RF-transparent optical elements adapted to focusing optical energy in a wavelength range including ultraviolet through infrared wavelengths, on an optical detector, and an RF antenna located behind the optical elements. One embodiment of the apparatus employs a Cassegrain infrared optical telescope system having a concave primary mirror, the front surface of which has applied thereto multiple layers of dielectric material comprising an interference filter reflective in a band of infrared wavelengths, and transmissive to radio frequency energy. A convex secondary mirror having a similar reflective coating is so located as to reflect infrared energy backwards through a central coaxial perforation through the primary mirror onto an infrared detector. The apparatus includes a planar RF antenna rearward of the primary mirror, which antenna utilizes the full aperture of the infrared optical system for the reception and transmission of RF energy. [A3411]

"ID microwave holographic sensor"

A method and apparatus for measuring both physical and electrical properties of a dielectric object using sequential spatial and spectral microwave data. The apparatus is a step CW microwave transmitter and receiver with a spatially modulated antenna positioned linearly in the Poynting vector direction. The method removes the antenna dispersion, removes the antenna image, transfers the image plane to the surface, removes diffraction and then removes the nuisance multipath by spatially integrating along the Poynting vector. The result is a clean complex surface reflection coefficient that contains only the subsurface or object plane information. This clean complex surface reflection coefficient may be compared to reflection coefficients of known objects in order to ascertain physical characteristics of the object. [A3412]

"Battery package and method using flexible polymer films having a deposited layer of an inorganic material"

A battery package for a thin battery includes a flexible base film that covers and encloses the battery and a flexible layer of an inorganic material such as silicon nitride, aluminum nitride or aluminum oxide deposited on the base film to encapsulate and seal the battery. The base film is formed of a flexible polymer material such as polyester that may be attached to the battery using a heat activated adhesive. The layer of inorganic material is deposited on the base film utilizing a low temperature CVD deposition process either before or after the base film is attached to the battery. [A3413]

"Golf information system"

A golf information system which automatically provides golfers with reference position and distance information from a number of points on a particular golf course hole. In one embodiment, radio frequency identification tags would be positioned along a golf cart path, for example, buried underneath the path, and a reading system carried by the golf cart would output an interrogation signal which would activate the tags causing the tags to output a coded signal which would be received by the reading unit, which would retrieve information about that location from memory and output it to the golfer. The system can further be used to display advertising messages and to provide golf course management features such as monitoring cart usage and speed of play. [A3414]

"Interacting multiple bias model filter system for tracking maneuvering targets"

A filtering system used in the tracking of a maneuvering target is provid A first filter estimates a partial system state at a time k in terms of target position measurements. A plurality of second filters are each provided with an acceleration model hypothesis from a prior time (k-1) free of position and velocity constraints. Each second filter generates an acceleration estimate at time k and a likelihood at time k that the acceleration model hypothesis is correct. The likelihoods from the second filters are summed to generate a probability vector at time k. A third interaction mixing filter generates the acceleration model hypotheses from prior time (k-1) using the probability vector from prior time (k-1) and the acceleration estimates from prior time (k-1) . The third filter also provides an error covariance to the first filter to reflect the uncertainty in the acceleration model hypotheses from prior time (k-1) . A probabilistic acceleration estimate for time k is formed as a sum of each of the acceleration estimates associated with each of the acceleration model hypotheses multiplied by a corresponding probability from the probability vector. The partial system state estimate and the probabilistic acceleration estimate are summed to generate a complete system state estimate at time k in terms of position, velocity and acceleration of the maneuvering target. [A3415]

"Multimode radar for road vehicle blind-zone target discrimination"

A road vehicle radar system for discriminating between hazard and non-hazard targets within a predetermined zone uses a pair of frequency modulated continuous wave radar cycles (FM-CW) and a single continuous wave cycle (CW) in the generation of radar quantities for measuring target range and apparent target velocity. Measured quantities from the FM-CW and CW cycles are compared with predetermined quantities for discriminating between hazard and non-hazard targets. [A3416]

"Smart blind spot sensor"

A radar system for sensing the presence of obstacles in a vehicle's "blind spots" and generating a signal to the vehicle operator indicative of the presence of such an obstacle. The system uses a common radar transceiver that transmits a radio frequency signal directed at a blind spot of the vehicle. The signal is reflected off any obstacles that are present in that blind spot region. A Doppler shift in the received reflected frequency generally indicates that an obstacle has moved into the blind spot. Doppler frequencies attributable to objects which are of no interest, such as stationary objects, are filtered out. Only obstacles that are traveling at approximately the same speed and direction as the vehicle are considered to be of interest, and will cause the blind spot sensor to generate an indication that an obstacle is present in the blind spot. The indication is preferably an unobtrusive illuminated indicator which is affixed to one of the vehicle's mirrors. In addition to the illuminated indicator affixed to a mirror, an obtrusive audible indicator is provided in the preferred embodiment of the present invention which creates an audible tone, whistle, or buzz when an obstacle is present and the vehicle's turn signal is active. [A3417]

"Stepped frequency ground penetrating radar"

A stepped frequency ground penetrating radar system is described comprising an RF signal generating section capable of producing stepped frequency signals in spaced and equal increments of time and frequency over a preselected bandwidth which serves as a common RF signal source for both a transmit portion and a receive portion of the system. In the transmit portion of the system the signal is processed into in-phase and quadrature signals which are then amplified and then transmitted toward a target. The reflected signals from the target are then received by a receive antenna and mixed with a reference signal from the common RF signal source in a mixer whose output is then fed through a low pass filter. The DC output, after amplification and demodulation, is digitized and converted into a frequency domain signal by a Fast Fourier Transform. A plot of the frequency domain signals from all of the stepped frequencies broadcast toward and received from the target yields information concerning the range (distance) and cross section (size) of the target. [A3418]

"Method and apparatus for determining runoff using remote geographic sensing"

Images of a selected geographic region are obtained using remote sensing apparatus and are processed to determine characteristic spectral reflectance patterns associated with different ground covers and soil types in the region. The image processing means compares the spectral reflectance patterns to image pixel values in order to classify each pixel in a ground cover or soil type class, the corresponding spectral reflectance pattern for which matches the pixel value. In a preferred embodiment of the invention, Geographic Information System (GIS) software is utilized to combine a remotely sensed image providing ground cover classifications for a geographic region with a remotely sensed image providing soil type classifications for the same region in order to generate a rainfall loss function. The rainfall loss function can then be used to determine a runoff curve number (RCN) for the region, to determine probable maximum flood (PMF) , or to generate various design flood hydrographs corresponding to different precipitation events using a computer water shed model. [A3419]

"Method and apparatus for obtaining sectional information of the underground by measuring time differences and strength of electromagnetic signals"

An underground radar tomography in which an electromagnetic wave is radiated into the ground, the amplitude and propagation time of a transmitted wave, a reflected wave or a diffracted wave of the electromagnetic wave are measured at a number of points, and signal processing is performed on the result of measurement to thereby obtain the distribution of strata and soil in the ground as section information with a high accuracy. By use of two pseudo random signals which are slightly different in period but the same in code pattern, measurement time which is expanded relative to propagation time is obtained to thereby make the measurement accuracy high. [A3420]

"Data fusion workstation"

A data fusion workstation provides an apparatus and method for realizing the full potential of geophysical and remote sensing by mathematically integrating sensors with each other. Sensor data from each of a plurality of sensor types are related mathematically to each other through a common site model to produce a fused picture with quantified accuracy. Using the concept of pseudo-data, information in sensor data is made equivalent to data in a statistical correlation model, allowing fusion of model information with sensor data during a data inversion step. The process of data fusion comprises several processing steps, which are executed by various microprocessors in a recursire/distributed/parallel-architecture platform. These steps comprise geophysical inversion, geostatistical Kriging, application of statistical information concepts, implementation of a square root information smoother, and application of likelihood techniques. [A3421]

"Interactive television and data transmission system"

A spread spectrum system provides bidirectional digital communication on a vacant television (TV) channel for simultaneous use by more than 75,000 subscribers using time and frequency division multiplex signals locked to horizontal and vertical sync pulses of an adjacent channel Host TV station. The system, whose operation is analogous to a radar system, comprises: (1) the Host TV station to send down-link sync and data pulses to subscribers during the horizontal blanking interval (HBI) , (2) subscriber "transponders" which detect those signals and transmits up-link "echo" data pulses only during the HBI to eliminate interference to TV viewers, and (3) a central receiver which also uses the host TV sync pulses to trigger range gates to detect the up-link data pulses. In a preferred embodiment the central receiver employs directional antennas to determine direction to transponders and to define angular sectors partitioning the service area into pie-like "cells" which permit frequency re-use in non-contiguous sectors (like cellular radio) . The system thus operates like a radar to measure elapsed time between receipt of TV sync pulses and receipt of transponder response pulses and measures bearing to transponders to thereby determine the location of fixed or mobile subscribers as well as provide data links to them. Transponders may share user's existing TV antenna or may operate on cable TV and could be packaged as "RF modems" for personal computers, as transceivers for mobile or portable use, or they may be integrated with a TV receiver to provide "interactive television". [A3422]

"Device for the exchange of data by electromagnetic waves"

In order to increase the sensitivity and range of a system for the exchange of data by microwaves between a fixed station, or reader, and a mobile station, or badge, the modem of the badge includes an oscillator. A single transistor works, under a first bias, as a detector of the wave transmitted by the reader and demodulates this wave, and then, under a second bias, it works as an oscillator and modulates the response transmitted by the badge. Applications to the exchange of data at a distance. [A3423]

"Method and apparatus for determining ship position in a television image"

Apparatus for detecting the position of a vessel in a broadcast image of the radar scan in a radar monitored area includes a television monitor for displaying a broadcast image of a radar scan of the area, and a controllable reflector for varying reflection of the radar waves impinging thereon from the monitoring radar to produce identifiable signal components in the broadcast image of the radar scan received on the television monitor. This controllable reflector may be actuated by the vessel operator to vary the reflection of the radar waves and produce variations in the broadcast image to enable the operator to identify the position of the vessel in the radar scan image appearing on the monitor. The monitoring installation includes a monitoring radar transmitter/receiver, and a television transmitter televising an image of the radar scan. Desirably, it includes a scan converter which receives the signals in polar coordinate form and provides rectangular raster signals with X and Y coordinates. [A3424]

"Situation awareness display device"

A situation awareness display device for providing a graphical display of e relative position of remote units moving along with and in proximity to the local unit utilizing the device. The device is comprised of a tracking means for determining the instantaneous position of the local unit, a communications means for communicating that local position information to cooperating remote units over an external communication link, and receiving the position information of those remote unit over that same external link, a navigation means for deriving course following information, direction and velocity of said display device from said local unit position information, a main processing means for controlling the flow of information within said device and for deriving the relative position of the remote units with respect to the local unit from their respective position information, and a display means for retrieving and graphically displaying said stored relative position information in a uniquely configured display format showing the relative positions of the remote units from the perspective of the local unit. [A3425]

"Method and device for measurement of the velocity of a moving target by making use of the Doppler shift of electromagnetic radiation"

Method and apparatus for measurement of the velocity of a moving target (20) in radio frequencies. From the measurement station (10) and from the target station (20) , radio signals (S.sub.1,S.sub.2) are transmitted that are in different frequency ranges, as compared with each other, so that the receivers at the measurement station (10) and at the target station (20) are not subjected to interference. The radio signals (S.sub.1,S.sub.2) are received at stations (20,10) opposite to their transmission stations (10,20) . The oscillator of the target station (20) is locked with the frequency transmitted by the measurement station (10) by means of a phase-locked loop (PLL) . The frequency of said oscillator is passed to the transmitter part of the target station (20) . The signal (S.sub.2) transmitted by the target station (20) is received at the measurement station (10) . The Doppler shift (fd) of the frequency of the signal (S.sub.1) transmitted from the measurement station (10) and of the signal received at the measurement station is measured, and the velocity (v) of the moving target to be measured is determined on the basis of the Doppler shift. [A3426]

"Radar system and components therefore for transmitting an electromagnetic signal underwater"

A radar system is shown to include a transmitter for transmitting a pulsed electromagnetic signal having a frequency less than 500 Hz and a receiver for receiving a (scattered) reflected signal provided from the pulsed electromagnetic signal (scattered) reflected from an anomaly below the surface of the water. The radar system further includes a switch for inhibiting the receiver from receiving a reflected signal provided from the pulsed electromagnetic signal reflected from the surface of the water and a signal processor for controlling interoperability of the transmitter, the receiver and the switch. With such an arrangement, a radar system is provided for detecting anomalies such as a wake of a moving vessel (if and when this produces a conductivity anomaly) , or a plume of oil beneath the surface of water. [A3427]

"Spray paint monitoring and control using doppler radar techniques"

Systems and methods that use a CW Doppler radar to monitor paint particle velocities as they are sprayed from a paint gun to optimize the application of sprayed paint onto the object, and provide a closed loop spray painting system and paint spraying method that controls the application of paint in real time using data generated by the radar. The Doppler radar and a signal analyzer are used to analyze the Doppler return signals and display data indicative of the velocity of the paint particles. The data may be used by an operator to manually adjust the paint spray system. In addition, the spectrum analyzer may be used to generate and couple control signals to the paint spray system to provide for closed loop feedback control of thereof. One method comprises the following steps. Spraying paint particles toward an object that is to be painted using a paint spray gun. Radiating Doppler radar signals at the paint particles that are moving toward the object. Receiving backscattered Doppler shifted radar returns from the moving paint particles. Processing the received backscattered Doppler shifted radar returns to produce data indicative of the velocity of the paint particles. Displaying the data indicative of the velocity of the paint particles. This method unobtrusively and remotely measures paint particle velocity and velocity distribution. By additionally generating control signals in response to the data, the paint spray system is controlled. [A3428]

"Blindzone signal indicator"

A display apparatus for blindzone signal indication comprises an exterior rear view mirror housing and an exterior rear view mirror disposed in the exterior rear view mirror housing. The exterior rear view mirror defines a portion from which light is reflected and a portion through which light may be transmitted from inside the rear view mirror housing. A light source mounted within the housing is located at the light transmissive portion of the mirror and a directional filter located at the light transmitting portion of the mirror filters light emitted by the light source so that a signal from the light source may be seen from the interior of the vehicle, but may not be seen by drivers of other vehicles. [A3429]

"Track filter bias estimation"

A radar system including a Kalman filter that processes radar return signals to produces position, velocity, acceleration, gain and residual error output signals, and a post-processor that processes these signals in accordance with a track filter bias estimation procedure. The procedure computes bias estimates and revised position, velocity and acceleration output signals that are corrected for bias error. The revised output signals are coupled to the radar system to track a target. The track filter bias estimation method computes bias estimates in accordance with the relationship: ##EQU1## where Res, K.sub.1 /K.sub.2, R and T denote the residual, gains, range, and filter cycle time, respectively, and the tilde indicates a sample averaging. The present invention also provides for improved maneuver detection by implementing an acceleration estimation algorithm used to track a maneuvering target. The present invention is applicable in all fields and areas where estimation using Kalman filters is used. [A3430]

"Portable data processing device capable of transmitting processed data on a radio by reflection of unmodulated carrier signal externally applied"

A detachable IC card applicable to a portable data processing device referred to as an "electronic organizer" is disclosed. The IC card is formed of microstrip lines formed on a dielectric substrate. An antenna receives an externally applied unmodulated carrier signal and guides the received signal to microstrip lines for impedance conversion. Cathode potential of a diode is varied in response to a data signal outputted from a CPU, so that the barrier capacitance of the diode varies. Accordingly, the carrier is reflected according to the data signal and radiated toward the electronic organizer main body through the antenna. An oscillator for data transmission is not required in the IC card, so that an internal battery having a large capacitance is not required, either. As a result, without increasing the size and weight of the device, radio transmission of data from the IC card can be accomplished. [A3431]

"Polarimetric radar signal mapping process"

A process for mapping a region of interest using polarimetric radar signals is disclosed. The process provides for the polarimetric calibration of polarized signal data to account for distortions arising from cross-talk and channel imbalance during signal transmission and/or reception. Moreover, the process also can be used to correct for ionospheric signal distortions of polarized signals with low frequencies prone to Faraday rotations upon encountering the ionosphere. Such calibrations are accomplished with a reduced number of, typically ground-based, signal reflection devices used for calibrating the polarimetric signals to compensate for the above distortions. [A3432]

"Electronically controlled frequency agile impulse device"

An electronically controlled frequency agile impulse source utilizing pulse sharpening techniques to increase its versatility in radiating impulse energy at a variety of center frequencies and bandwidths in the megahertz to the gigahertz range. Such pulse sharpening provides for a radiator having a wider range of applications. [A3433]

"Automatic anechoic chamber calibrator"

A calibration reference target fixture is mounted on a pylon having a motorized spline extending longitudinally therethrough. The body of the fixture is teardrop shaped so as to present a low reflection cross section to a transmitting antenna. The reference target itself is a hinge-mounted plate which is driven by cam means connected to the motorized spline for selectively moving the plate between a deployed exposed position and a stored position, within the recess of the fixture body. [A3434]

"Method for distinguishing between at least two targets"

The present invention relates to a pulse Doppler radar wherein the phase position of the reflected signals is evaluated as the most important component in addition to the amplitude. Thus a very good resolution results in the range direction and in the velocity direction for the detection of multiple target situations. The invention can be employed particularly for a so-called HPRF radar. [A3435]

"Radar apparatus provided with a coherent clutter map"

A radar apparatus provided with transmitter means (1) , rotating antenna means (2) and receiver means (3) for the transmission per burst and the processing in a video processor of radar echo signals. The video processor includes moving target detection unit (4) provided with a doppler filter bank, for instance an FFT processor, and slow moving target detection unit (6) , provided with coherent clutter maps, one map for each radar transmitter frequency used. The coherent clutter maps are also used for reducing the clutter strength of radar echo signals which are applied to the moving target detection unit (4) , by subtracting the coherent clutter strengths stored in the clutter maps from the radar echo signals. [A3436]

"Transponder for vehicle identification device"

The invention relates to a transponder for a vehicle identification device in which a radio wave including vehicle information returned from transponders provided in a vehicle is received by an interrogator. The vehicle transponder receives a query radio wave and uses a detection device to generate a previously memorized coded signal train in response to a received wave. The coded signal train varies an amount of bias voltage of the detection device so that a reflection coefficient of the detection device is varied to modulate the reflection wave of the query radio wave and the modulated wave is transmitted back to the interrogator. [A3437]

"Secure toll collection system for moving vehicles"

A secure toll payment system is realized by transmitting a changeable encryption code from roadside equipment at a toll plaza to a moving vehicle. Thereafter, the moving vehicle uses it to encrypt payment information according to the Data Encryption Standard algorithm. The moving vehicle transmits the encrypted payment information to the roadside equipment which performs a credit or debit transaction. Because the encryption code changes from time to time, so too does the nature of the signal which is transmitted by the vehicle, and fraud, based on electronic eavesdropping, is substantially eliminated. The encryption code comprises an 8-bit random number and a time/date number. Vehicle-mounted apparatus includes a transponder unit and a portable smart card which inserts therein. The roadside equipment includes a pair of spaced-apart antennas that are sequentially located along an express payment lane at a toll plaza and a computer (Plaza Server) which controls them. [A3438]

"Radar with doppler tolerant range sidelobe suppression and time domain signal processing"

A radar system includes a doppler/pulse compressor/range sidelobe suppressor filter bank (40) , which separates received echo signals according to their frequency spectrum into doppler channels, and within each doppler channel performs pulse compression for reducing the duration of the received signals, and also performs range sidelobe suppression, for improving range resolution. It may be advantageous to perform certain types of processing in the time domain, such as determination of spectral moments for estimating velocity spread, mean closing velocity, and reflectivity of a diffuse target such as a weather phenomenon. An inverse (frequency-to-time) transform (50) is performed on the signals produced by the doppler/pulse compressor/range sidelobe suppressor filter bank (40) , to produce a reconstructed version of the received signals. In these reconstructed signals, the pulses are compressed, and range sidelobes are reduced. The time-domain processing (62) is performed on the reconstructed signals. In a particular embodiment of the invention, the range sidelobe suppression and pulse compression filters (34a, 34b . . .) follow the doppler filters (32) , but any ordering of the filters may be used. Interchannel frequency interference attributable to the non-zero bandwidth of the Doppler filters may be reduced by pulse-to-pulse time weighting (30) applied to the received signals over a time window corresponding to a particular dwell, together with inverse weighting (62) following the inverse transformation. [A3439]

"Apparatus for measuring speed"

An apparatus for measuring speed with respect to an object comprises first to Nth sensors sensitive to energy received from first to Nth consecutive regions, respectively, of the object. Signal delay means are provided to delay the signals from the second to Nth sensors, the delay increasing with sensor number. A subtractor is provided to form the difference between the sum of the signals of the even-numbered sensors and the sum of the signals of the odd-numbered sensors. [A3440]

"Modem for telecommunication system with a reflection amplifier function"

A modem which is to be included in a badge or mobile station, in a system for the exchange of data by microwaves with a fixed station or beacon. The modem has at least one transistor that works as a detector in reception or as an amplifier for the transmission of a reflection signal, according to gate bias voltages (V.sub.gs0, V.sub.gs1) that are applied to it, and drain currents (I.sub.ds) that result therefrom. The transmission-reception switching is done by transistors that switch over loads, and hence currents, on an amplifier transistor, with amplitude or phase modulation. Such a modem may find particular application in short-distance telecommunication systems. [A3441]

"Unwanted signal suppression device"

An unwanted signal suppression device is disclosed for suppressing unwanted signals in input signals containing desired and unwanted signals. The input signals are divided into segments in the time domain. The device includes a unit for detecting the segment having maximum power, a unit for computing reflection coefficients on the basis of the segments except the detected power segment, and a lattice filter for suppressing the unwanted signals by using the computed reflection coefficients. A second device includes a reflection coefficient computing unit, a median filter and a lattice filter. A third device includes a unit for estimating unwanted signals frequency, a filter for computing filter weights on the basis of the estimated frequency and filter coefficients and for applying the computed weights to the input signals so as to suppress the unwanted signals. [A3442]

"Multi-frequency, multi-target vehicular radar system using digital signal processing"

A vehicular collision avoidance radar system using digital signal processing techniques including a transmit section that generates a two channel transmit frequency. An antenna both transmits the transmit signal and receives a reflected receive signal. A Schottky diode mixer generates a difference signal having a frequency equal to the transmit frequency minus the receive frequency. A signal switch in a front end electronics section time demultiplexes and samples the channel 1 and channel 2 signals. The samples are coupled to a two-channel analog to digital (A/D) converter. A digital electronics section receives the digital information and performs a Fast Fourier Transform (FFT) on each channel of digital data to determine relative speed and range of a target based upon the frequency and the difference in phase of the two channels. The digital electronics section also receives information regarding the status of vehicle operation and/or controls to determine the degree of danger presented by an identified target. [A3443]

"Apparatus for combining data produced from multiple radars illuminating a common target area"

An apparatus for combining signals from a plurality of radar installations is described. A methodology for combining signals from a pluraltiy of radar installations/sensors has been developed. This methodology provides enhanced target detection performance by properly fusing together the commensurate range-Doppler filter bins of each sensor. In this methodology, the processing of each of the individual radars in the Doppler frequency domain is provided such that a common velocity domain is obtained from each of the radars. Using a zero fill discrete Fourier transform, the velocity domain obtained from each radar is further normalized to have a common bin size. Additionally, for the higher frequency radars, the normalized velocity bins are unfolded so that each radar signal produces the same number of velocity bins in its respective velocity domain. Once the common velocity coordinate has been obtained a vector addition of the resulting velocity bins produces a common radar velocity signal which can be detected and processed. Combining radar signals before detection results in a gain in sensitivity over systems which combine signals after detection. [A3444]

"Distance measuring system"

A distance measuring system which may be used on a golf course in order for a golfer to accurately measure the distance between the present lie of his golf ball and the hole toward which he is currently advancing the golf ball. A master transceiver station is portably carried by the golfer to be disposed proximate the lie of his ball for measurement purposes, and a remote transceiver system is located in or on each hole's flag marker pole. The present system uses, as the basic measurement frequency, only the frequency of the remote carrier itself. Two separate and distinct phase measurements are made in rapid succession. The first measurement is made with the master RF carrier displaced above the remote carrier frequency by amount equal to the IF frequency, and the second measurement is made with the master carrier frequency displaced below the remote carrier frequency by the same amount. With these two phase measurements, range or distance can be measured unambiguously and accurately over a required distance of at least 300 yards for golf purposes. The phase information from the remote location is communicated to the master location by phase-locking the carriers together. This avoids the necessity of using modulated subcarriers to transmit this information. This, in turn, reduces the occupied bandwidth, simplifies the modulation-demodulation required, and reduces errors normally introduced by the subcarrier filtering processes of the prior art. [A3445]

"Proximity alert system"

A proximity alert system including a pair of portable electronic, coded transmitter/receiver units designed to operate in a specific signal band. Each unit transmits a coded signal that is picked up by the other unit. The strength of the received coded signal controls the rate of an audible beeper. The rate of the beeper indicates the approximate distance between companion units. A direction-finder antenna is used to indicate the direction of the received coded signal. [A3446]

"Method for estimating position of objective obstacle for vehicle"

In a vehicle equipped with a distance measuring unit capable of measuring a distance between the subject vehicle and an objective obstacle, the objective obstacle is detected along a widthwise direction of the vehicle by the distance measuring unit. Detection data detected by the distance measuring unit are developed on X and Y coordinates in which the widthwise direction of the subject vehicle is represented by an X axis, the longitudinal direction of the subject vehicle is represented by a Y axis, and the position of the subject vehicle is defined as an origin. Each of obstacle data is labeled in such a manner that the same labels are affixed to obstacle data which are in proximity to one another on the coordinates. The amount and direction of movement are calculated for every label on the basis of the last data and the current data, and a relative speed for every label relative to the subject vehicle is calculated by dividing the amount of movement by a sampling time. The position of the objective obstacle after a lapse of a predetermined time is estimated on the basis of a relative speed vector determined from the relative speed and the direction of movement. Thus, the accuracy of estimating of the position of the objective obstacle is improved. [A3447]

"Radio frequency automatic identification system"

A radio frequency automatic identification system detects targets which include solid resonators resonating at several frequencies, attributing information to the frequencies at which the target resonates. Preferred resonators are quartz crystals, which may be made by a process of heating quartz to soften it and cutting crystals to approximate size and resonant frequency. Resonators produced by such a process are measured to determine their actual resonant frequency, and preferably the crystals are sorted into predetermined frequency windows in accordance with their measured resonant frequency. A set of resonators having frequencies corresponding to predetermined data is selected from the sorted groups of resonators and incorporated into a target. The preferred target is an ink-like material having a plurality of resonators disposed in a matrix which is radio frequency transparent at the frequency of interest. Targets are preferably detected by repetitively sweeping the frequency of the interrogating signal through a range which includes the information-bearing range of the system. [A3448]

"Traffic monitoring and management method and apparatus"

Methods and apparatus for the automatic and management of traffic, utilizing a microprocessor-based, read-write vehicle borne transponder device. The system includes plurality of transceivers spaced along and positioned adjacent to a roadway, a plurality of vehicle borne transponders, and an independent network management computer. As vehicles traverse the roadway the transponders communicate with the transceivers and one or both of those units collect information such as, vehicle entrance point, vehicle exit point, vehicle speed, number of passengers in each vehicle, and vehicle class. Some of the collected information is processed by the transceivers and transponders, while other information is transmitted to the network management computer for processing. [A3449]

"Method for locating and examining cavities under paved roads"

The present invention provides a cavity examination method of a paved road which can examine cavities which are present under the paved road such as the asphalt-paved road in a reduced length of time. By collecting data of the structural conditions of areas under the paved road while traveling on the road by a pavement structure examination vehicle mounted with underground radar means, and scrutinizing according to the above results around the place which may contain a cavity by a pushcart type underground radar means, the cavity examination method of the present invention specifies presence and a planar extent of the cavity. If a cavity is actually detected, a hole with a small diameter is bored in the place and its inner circumferential wall is photographed by a camera to confirm the conditions of the cavity and the area under the pavement by a visual inspection in order to grasp the three dimensional conditions of the cavity. [A3450]

"Multi-frequency automatic radar system"

A Doppler control circuit for a CW or pulse Doppler radar system for monitoring not only the phase shift between echo signals from several targets but also the amplitude difference between several targets and to further tune the radar to a particular target among one or more targets from which echo signals return. The control circuit can be used in state of the art CW or pulse Doppler type radar systems. In a further system, a continuously generated radar signal is repeatedly transmitted at different frequencies in time division fashion to define a succession of transmit and receive frames. The receive frames are divided into a plurality of time interval windows with selected windows being used to detect received signals at the different frequencies. The remaining windows can be used for subsystems of the radar system. The rate of phase shift of received signals at a reference frequency is used to determine closing rate, (positive or negative) while the phase shift difference between received signals at two frequencies is used to determine range and target direction. In yet a further system, a special circuit is provided for conditioning selected portions of the Doppler frequency spectrum to attenuate or de-emphasize portions of the echo signal corresponding to selected targets in the radar system environment, such as rain or stationary wayside objects, in order to give such echo signals less weight in determining roadway hazards. [A3451]

"High power photon triggered ultra-wideband RF radiator with opposite apertures"

A photoconductive switch coupled to an energy storage device wherein the tch is comprised of photoconductive semiconductor material while the energy storage device comprises two discrete dielectric mediums. Each medium having a conductive electrode on the top and bottom surfaces to essentially form parallel capacitors wherein the parallel capacitors are separated by a predetermined gap distance. A photoconductive switch electrically connected to each medium such that the switches are located on the opposite sides of their respective mediums. The predetermined gap distance (between the electrodes) and the photoconductive switches (on opposite sides of the storage devices) provide suppression of surface flashover between very high voltage, charged electrodes.

Such flashover suppression allowing for very high power pulse generation. [A3452]

"Truck/trailer control system"

Automatic Trailer Control System--containing four principle inventions. One part of the invention provides automatic trailer steering control to the trailer to cause a delayed turn of the trailer steering mechanism while maneuvering a turn. A second part of the invention provides an electro-magnetic braking system, to the trailer, which is controlled by the same Microcomputer system that controls the trailer turning. The third part of the invention utilizes the electro-magnetic braking system as an alternator/generator to be used as an auxiliary battery charging system. A fourth part of the invention uses the electro-magnetic braking system as a motor to drive the trailer wheels as an assist during trucking operations. All operational functions are controlled by the Microcontroller based control system mounted on the trailer rear wheel platform. Sensors are placed on the truck/trailer operating system to obtain operational information needed for the control of the system. [A3453]

"Integrated circuit device including means for facilitating connection of antenna lead wires to an integrated circuit die"

A method and apparatus for facilitating interconnection of lead wires to an integrated circuit including the provision of an additional protective layer of insulation to the top of an integrated circuit chip or die and the provision of enlarged plated electrodes to the surface of the additional insulation to form enhanced bonding pads, such pads being electrically connected through the protective layers to the normal bonding pads of the integrated circuit device. The enhanced bonding pads are made of a soft conductive metal such that external wires to be attached thereto can be bonded to the pads using a thermal compression bonding technique. [A3454]

"Active antenna for two-way transmission"

This active antenna is incorporated in the terminal station of a system for data exchange with a central station, by the modulation of a microwave carrier. The terminal station is of the chip card type. The modem of the active antenna is constituted by a transistor, the bias current of which is switched over from a low value at demodulation to a high value at modulation. The switch-over is obtained by a circuit with three resistors (R.sub.d, R.sub.gd, R.sub.g) , which themselves have their values switched over by two transistors parallel connected with the resistors, these transistors being controlled by two signals emitted by the control circuit of the terminal station. The active antenna can be applied to long-distance data exchange, for example in the remote management of toll-charge systems, remote cash dispensing, localization of moving bodies etc. [A3455]

"Interference avoidance system for vehicular radar system"

An interference avoidance system used in conjunction with a vehicular target detection system. The microwave transceiver section of the vehicular target detection system, in which the present invention is incorporated, transmits and receives time-multiplexed microwave signals having at least two channels (frequencies) spaced about 250 kHz apart. The time-multiplexed transmit signal is transmitted and strikes objects (targets) in the environment, and a portion of the transmit signal is reflected back the antenna. A difference signal having a frequency equal to the difference between the frequency of the transmit and the received signal is generated, digitized, and a Fast Fourier Transform (FFT) is performed on the digitized difference signal. A microcontroller analyzes the energy spectrum to determine whether there is interference present. If such interference is present, the microcontroller causes the transmit frequency to change until a frequency is found which is relatively free of the interference. [A3456]

"Method of determining the electrical properties of the earth by processing electromagnetic signals propagated through the earth from a capacitor"

A method of processing electromagnetic signals which are injected into the earth from a capacitor and subsequently detected after reflection from subsurface layers, in order to determine the physical and electrical properties of those layers. The method is based on an iterative process which models the earth as a series of vertically stacked horizontal layers, each characterized by its physical properties of depth beneath the surface and thickness, and its electrical properties of resistivity (or conductivity) and relative dielectric constant. An initial propagation model which specifies the electrical properties of a particular layer or set of layers is constructed and applied to a model input pulse to produce a predicted return pulse which results from the reflection and/or transmission of the input pulse at the boundaries of the layer (s) . The predicted return pulse is then compared to actual return pulse data which is selected so as to roughly correspond to a return pulse produced at the location of the modeled layer (s) . The result of the comparison forms the basis for adaptively varying the parameters of the propagation model in a manner which is intended to increase the correlation between the predicted return pulse and the actual data. Repetition of the method for different layers or additional locations permits the electrical characteristics of the earth beneath a specified region to be determined. Knowledge of these characteristics can be used to infer the type of geologic formation responsible for transforming the input pulse into the received pulse. [A3457]

"Post detection integration method and apparatus for pulse compression radar utilizing surface acoustic wave (SAW) matched filters"

Received expanded radar pulses pass through a surface acoustic wave (SAW) weighted filter (64) for sidelobe suppression, and then into a SAW tapped delay line (66) . The pulses appear at the taps (66a,66b,66c) of the delay line (66) coarsely aligned in time, pass through individual SAW matched filters (68,84,86,88) for compression and envelope detectors (70,90,92,94) for demodulation, and then into a summer (74) for post detection integration. Individual frequency shifters (78,80,82) are provided between the delay line taps (66a,66b,66c) and the matched filters (84,86,88) for shifting the center frequencies of the pulses and thereby the propagation delays through the matched filters (84,86,88) to provide fine alignment of the pulses in time. The delays through the individual delay line taps (66a,66b,66c) and the frequency shifts of the frequency shifters (78,80,82) are adjustable "on the fly" to compensate for variation of pulse repetition rate (PRF) and interpulse jitter. [A3458]

"Vehicle identification and classification systems"

An interrogator-transponder system in which multiple vehicle mounted transponders which may be closely spaced in distance and moving at similar velocities, respond with a coherent identification code signal that is displaced in frequency from the interrogation signal by an amount that is identical for each transponder. The response signal spacings in time (Pulse repetition intervals) are different for each transponder but are always multiples of the pulse repetition interval of the interrogation signal. A coherent reference for the received transponder codes is obtained by combining the coherent interrogation signal with a coherent reference that is substantially identical in frequency to the displacement frequency of the transponder response signal. Means are provided in the interrogation device to determine the velocity of each transponder and its range with respect to the interrogator and to identify vehicles with inoperative transponders. The resulting data stream of identification codes and associated velocities and ranges may be used for traffic speed enforcement, wanted vehicle search, interactive traffic signal control, automated toll collection, traffic surveys, and identification of friendly forces. [A3459]

"Method for ambiguity resolution in range-Doppler measurements"

A method for resolving range and doppler target ambiguities when the target has substantial range or has a high relative velocity in which a first signal is generated and a second signal is also generated which is coherent with the first signal but at a slightly different frequency such that there exists a difference in frequency between these two signals of .DELTA.f.sub.t. The first and second signals are converted into a dual-frequency pulsed signal, amplified, and the dual-frequency pulsed signal is transmitted towards a target. A reflected dual-frequency signal is received from the target, amplified, and changed to an intermediate dual-frequency signal. The intermediate dual-frequency signal is amplified, with extracting of a shifted difference frequency .DELTA.f.sub.r from the amplified intermediate dual-frequency signal done by a non-linear detector. The final step is generating two quadrature signals from the difference frequency .DELTA.f.sub.t and the shifted difference frequency .DELTA.f.sub.r and processing the two quadrature signals to determine range and doppler information of the target. [A3460]

"FM-CW radar"

A switching type FM-CW radar, the type of FM-CW radar improved to reduce FM-AM conversion noise, is further improved to reduce interference by radar waves from other vehicles and echo waves returned from them. A switching circuit is provided at the transmitter side, and its switching frequency is set at a different value for each individual vehicle. Furthermore, the switching frequency of an interfering wave is measured, in accordance with which the switching frequency of the switching circuit is changed. [A3461]

"Docking velocity indicator system"

A relative velocity indicator system for assistance in the docking of vessels uses a radar sensor providing a relative velocity signal indicative of the relative velocity between a ship and a reference, such as a dock. A wireless transmitter associated with the radar sensor receives said relative velocity signal and transmits a signal indicative of said relative velocity signal. A portable receiver and indicator unit carried by the captain of the vessel has a receiver for receiving the transmitted signal and an indicator arranged to receive, from said receiver, a receiver signal indicative of the transmitted signal and, thereby, of the relative velocity signal for indicating the relative velocity between ship and reference. [A3462]

"Safe stopping distance detector, antenna and method"

An FM/CW radar system is disclosed for determining a safe stopping distance between a moving vehicle and a potential obstacle. The radar signal is modulated linearly over several slopes. A microstrip phased array transmit/receive antenna is also disclosed having a hybrid tap, corporate feed structure. Signals from the antenna are amplified and filtered, and passed through an analog to digital converter to a signal processor, which performs a Fast Fourier Transform on the signals to convert them from time domain data to frequency domain data. The frequency domain data is then used to solve target range and doppler equations, determine safe stopping distances, and sound or display alarms if the safe stopping distance has been violated. A sensitivity control adjusts for road conditions or operator reaction time variations. [A3463]

"Microwave vehicle detector"

The present invention provides a microwave vehicle detector which includes a transceiver for transmitting microwave energy into a desired target area and for receiving reflections of this microwave energy from vehicle movement in this target area. The transceiver includes first and second diodes for enabling the microwave vehicle detector to determine the direction of vehicle movement relative to the position of the microwave vehicle detector. In this regard, these diodes are balanced, such that a predetermined phase difference will be produced between the doppler shift signals generated by these diodes. This phase difference is analyzed by a microprocessor to determine the speed and direction of the vehicle being detected. [A3464]

"System and method for detecting radiant energy reflected by a length of wire"

A method and system for detecting wire in a terrain avoidance, terrain following, or a terrain obstacle system. Radiant energy pulses orthogonally polarized are alternately transmitted. Selected dimensions of a full scattering matrix of adjacent reflected pulses for a particular range are collected and combined to form a null matrix. A null matrix with the two reflected pulses being within a predetermined distance from one another is detected as a wire. [A3465]

"Multiple vehicle identification and classification system"

An interrogator-transponder system in which multiple vehicle mounted transponders, which may be closely spaced in distance and moving at similar velocities, respond to an interrogation signal in a sequential or random sequential manner so as to reduce response signal interleaving to an acceptable level. The response signals include a vehicle identification code and are processed by the interrogator to yield data, for example, on specific vehicle speed, distance from the interrogator, vehicle wanted for investigation, and vehicle with an inoperative transponder. [A3466]

"Spread spectrum conference call system and method"

A spread spectrum communications system for use over a communications channel, including a transmitter-generic-chip-code generator, a transmitter-message-chip-code generator, an EXCLUSIVE-OR gate, a combiner, a transmitter, a receiver-generic-chip-code generator, a generic mixer, a generic-bandpass filter, a receiver-message-chip-code generator, a message mixer, a message-bandpass filter, and a synchronous detector. The transmitter-generic-chip-code generator generates a generic-chip-code signal and the transmitter-message-chip-code generator generates a message-chip-code signal. The EXCLUSIVE-OR gate spread-spectrum processes message data with the message-chip-code signal to generate a spread-spectrum signal. The combiner combines the generic-chip-code signal with the spread-spectrum signal. The transmitter transmits the combined generic-chip-code signal and spread-spectrum signal, on a carrier signal over the communications channel as a spread-spectrum-communications signal. The receiver-generic-chip-code generator generates a replica of the generic-chip-code signal. The generic mixer recovers the carrier signal from the spread-spectrum-communications signal. The receiver-message-chip-code generator generates a replica of the message-chip-code signal. The message mixer despreads the spread-spectrum-communications signal as a modulated-data signal. The tracking and acquisition circuit uses the recovered carrier signal for synchronizing the replicas of the generic-chip-code signal to the recovered carrier signal. The synchronous detector synchronously demodulates the modulated-data signal as received data. [A3467]

"Microburst precursor detector"

A microburst precursor detector utilizes a multiplicity of radar beams and samples radar returns, in each beam, from meteorological radar signal reflectors and processes the signal returns in a statistical manner to determine average radar reflectivity and to extract doppler signal parameters. These parameters are utilized to determine a second set of parameters, average doppler frequency within each radar beam, doppler spectral spread within each radar beam, and the skewness of the doppler spectrum in each beam. The second set of parameters is processed to establish the existence of a microburst, predicted surface impact, time to impact, wind shear surface location and track, and the magnitude of the wind shear. [A3468]

"Identification system using hertzian waves, consisting of an interrogation station and a responder unit"

Identification system constituted by an interrogation station or interrogator 1 itself formed by a radio frequency wave transceiver and preferably on an ultra frequency wave length 5, and, on the other hand, by a responder unit 2 adapted to receive the wave and to re-emit (echo) it following the given coded modulation to the responder unit. The interrogator is adapted to receive this echoing wave 11 and to demodulate it in order to derive the identification code therefrom. The interrogator has an emission antenna adapted to emit an inquiry signal constituted by a radio wave emitted in plane polarization. The responder unit has two adjacent antennas, respectively, for the reception of the inquiry wave and for its re-emission (echo) after modulation. The two antennas are of the circular polarization type and each functioning in a direction of rotation of the polarization opposite with respect to each other. This allows a differentiation between the emission inquiry signal and the response signal, since the inquiry signal wave is received by a circular polarization-type antenna of the responder unit according to a first rotation direction of the polarization. The responder unit is adapted to re-emit a modulated response signal constituted by a radio wave of the same kind as the inquiry wave of circular polarization-type according to a second rotation direction of the polarization in the opposite direction to the first rotation direction. [A3469]

"Method of extracting phase errors caused by the atmosphere in the backscatter signal of a coherent imaging radar system carried by a carrier from radar raw data and apparatus for carrying out the method"

In a method of extracting phase errors caused by the atmosphere in the backscatter signal of an on-board coherent imaging radar system from radar raw data, firstly to image areas with different backscatter ratios over a predetermined period of time consecutive azimuth spectra are continuously formed. Thereupon, a frequency offset (.DELTA.F (t)) of the backscatter ratio component is obtained by determining the location of the maximum of the correlations between two respective immediately consecutively formed azimuth spectra. Then, a double integration for the difference of the frequency offset (.DELTA.F (t)) and a desired value (.DELTA.F.sub.soll) of the frequency offset is carried out, the frequency offset desired value (.DELTA.F.sub.soll) being determined either from the carrier forward velocity (V.sub.v) or by a low-pass filtering of the frequency offset (.DELTA.F (t)) , and finally for standardization the result of the double integration is multiplied by a constant (2.pi./.DELTA.t) to obtain thereby the phase error (.phi..sub.e (t)) . [A3470]

"Collision-preventing apparatus for electric motor vehicle"

A collision-preventing apparatus for an electric motor vehicle in which wheels are driven by electric motors and the electric motors are subjected to braking such as regenerative braking or dynamic braking. The apparatus includes an obstacle sensor and a control unit for processing detected information supplied from the obstacle sensor and for outputting a brake actuation signal when the result of processing indicates a set of conditions predetermined to be dangerous, so as to apply brakes to the electric motors. [A3471]

"Dual function satellite imaging and communication system using solid state mass data storage"

The present invention discloses a dual function satellite imaging and communication system (10, 40, 50, 60) using a solid state mass data storage device (30) which generates and stores image data at a relatively low data rate and subsequently transmits the data at a significantly higher data rate. The dual function imaging and communication system (10, 40, 50, 60) , which may be incorporated as a body mounted payload of an imaging satellite, provides a single antenna or aperture (28, 54, 62) to perform both the imaging and communication functions and simplify the imaging and communication systems of the imaging satellite by eliminating the requirement for a separately gimballed antenna and/or aperture for each system. Further, the present invention is designed to operate in a low duty cycle mode to minimize its power supply requirements. In short, the present invention combines and simplifies the imaging and communication systems of an imaging satellite to reduce the weight of the payload and, at the same time, improve the reliability. [A3472]

"One-dimensional electronic image scanner"

A microwave image scanning apparatus which utilizes a dispersive waveguide wedge in front of a microwave sensor. Similar to an optical prism, the waveguide wedge resolves multi-spectral microwave energy from various directions into the same direction for detection by the microwave sensor and subsequent formation of a refined high quality video image. The waveguide wedge consists of a collection of waveguide channels having their longitudinal axes aligned substantially in parallel. [A3473]

"Loro antenna and pulse pattern detection system"

A passive surveillance method and system, capable of operation in conjunction with both non synchronous and synchronous pulse pattern rotating ground radars. Received signal scan modulated pulses are deinterleaved and correlated with a previously selected repetitive portion of an interrogation signal source base pulse pattern. A single receiver channel, sequential lobe on receive only (LORO) direction finding antenna is employed in the system to modulate received signals to extract target object relative bearings for the correlated signals. The system makes use of all available data to determine the best estimate of the target object position. [A3474]

"Millimetric wave radar system for the guidance of mobile ground robot"

The disclosure relates to guidance devices on board autonomous vehicles or robots which have to move about notably in environments that are inaccessible or dangerous to human beings. Disclosed is a device for the detection of the environment, and the positioning and/or the guidance of a mobile vehicle on the ground, of the type comprising, firstly, means for the generation and transmission of a signal that can be reflected by a fixed obstacle and, secondly, means for the reception and processing of the signal reflected by said fixed obstacle, said processing means enabling the recognition of the environment and/or the guidance of said autonomous mobile vehicle, said transmitted signal being a millimetric wave radar signal and said transmission and reception means cooperating with a rotary antenna having a 360.degree. rotation in azimuth. [A3475]

"Data quality and ambiguity resolution in a doppler radar system"

The pulsed Doppler weather radar system reduces ambiguities in measured parameters by staggering at least one pulse of each frame of n pulses transmitted by the radar system. The staggered pulse creates an isolated pulse doublet pair to provide three or more independent and auxiliary Doppler parameter estimates. The parameter estimates are combined optimally in a neuromorphic processor matched to the phenomena of interest, particularly capitalizing on multiparameter volumetric correlations to improve data quality. [A3476]

"Device for determination of distances between close-range objects"

Device for determining distances in the close range (under 100 m) , hereby characterized in that both light pulses and high-frequency pulses are transmitted and received and the correct distance is determined in an evaluating device in a simple way and with reliability under nearly all atmospheric conditions. [A3477]

"Interrogator/transponder system and mobile transponder device"

An interrogation responder system composed of a transmitter stationarily mounted in a certain fixed place and a receiver mounted on a mobile object. The receiver on the mobile side starts the operation when a power is supplied to the entire circuit in accordance with a wake-up signal from the transmitter on the fixed side so as to modulate the electromagnetic signal emitted from the transmitter on the fixed side in accordance with a predetermined code and reflect a response. This enables continuing bilateral communication of a command, data and so forth. By starting communication between the transmitter and the receiver by a direct wave of a carrier signal in a microwave band after sensing that the receiver on the mobile side has entered a good communication zone, secure communication is enabled at a sufficient electric field strength. [A3478]

"Doppler-effect vehicle ground-speed detecting apparatus having means for detecting vehicle body inclination"

A Doppler-effect vehicle ground-speed detecting apparatus having a transmitter fixed to a vehicle body and transmitting a wave toward a road surface on which the vehicle is running, a receiver fixed to the body and receiving a portion of the wave reflected by the road surface, and a ground-speed determining device for determining a ground-speed of the vehicle relative to the road surface, on the basis of a transmitting frequency of the wave as transmitted by the transmitter and a receiving frequency of the wave as received by the receiver. The ground-speed determining device determines the ground-speed of the vehicle, on the basis of a parameter which changes with an angle of the vehicle body relative to the road surface in a plane parallel to a running direction of the vehicle and perpendicular to the road surface, as well as on the basis of a difference between the transmitting and receiving frequencies. [A3479]

"Moving target detection through range cell migration radar"

Radar signal processor for the detection of fast moving targets having small radar cross-sections. A method and apparatus is used to analyze a target that may travel through many range cells during coherent integration time. By transforming the pulse return data into the spatial frequency domain, range bin migration problems have been solved. The signal to noise ratio is also improved thereby permitting the detection of small targets. The processing consists of three major steps: performing an FFT for each pulse to yield spatial frequency components for each return, performing a special DFT for each spatial frequency yielding constant velocity output for each spatial frequency, and finally performing an inverse FFT to obtain target velocity and position. [A3480]

"System for measuring the distance between two stations mobile with regard to one another"

An emitted wave is transmitted from a central station to a passive end. A phase modulation circuit in the passive end modulates a signal resulting from the emitted wave for retransmitting it in the form of a two-phase-state modulated signal at the rhythm of a clock signal. In the central station, the modulated signal is demodulated into two quadrature signals. On the basis of the product of the two quadrature signals and the sign of the difference between the moduli of the rectified quadrature signals, the count of an up-down counter in a digital processing circuit is incremented or decremented in order for said count to be representative of the distance separating the passive end and the central station. [A3481]

"Moving target indicator using higher order statistics"

While the computation of high resolution radar images based on higher order tatistics is position insensitive, velocity estimation may be based on the ratios of values of a trispectral slice and a cross-trispectral slice computed as quadruple products of complex valued signals developed by coherent radar. Signal-to-noise ratio is improved by either averaging over a plurality of bursts during computation of both the trispectral slice and the cross-trispectral slice or averaging of values of ratios of trispectral slice and cross-trispectral slice values at particular frequencies or wavenumbers, or both. [A3482]

"Mobile speed awareness device"

A speed awareness device for allowing passing traffic to perceive from a source other than their own speedometers their true speed. A trailer supports a container within which a radar source is contained operatively connected to a display panel. A suitable source of power operates the radar and display and includes a battery, an optional photo voltaic source to power the battery and a plurality of instrumentalities to preclude or render less likely that the trailer will be moved by unauthorized personnel. These instrumentalities include a removeable trailer hitch, an axle lock, support stands for elevating the trailer and an internal alarm system. [A3483]

"High resolution radar profiling using higher-order statistics"

A coherent radar is used for achieving high resolution radar imaging of a moving object in sea clutter and noise. A stored replica of the transmitted waveform is combined with the returned signal in a synchronous detector to produce in-phase and quadrature (I and Q or complex) samples. High resolution is achieved by transmitting a series of pulses, each at a different frequency, and then processing these complex samples to produce a synthetic down-range profile. To enhance the radar target or object from system noise and sea clutter, the complex I and Q (in-phase and quadrature component) samples from the radar are coherently averaged in a special two-dimensional slice of the trispectrum (e.g. quadruple product or fourth-order moment) . This formulation of the fourth moment retains all important target information and suppresses Gaussian noise. Once averaged, a new set of I and Q samples are reconstructed that produce the same trispectral slice as this average. These reconstructed samples are then transformed using conventional Fourier transform methods to produce the average, or enhanced, down-range profile. [A3484]

"Road void search radar system"

A road void search radar system includes a rotary encoder, a radar controller, an analyzer, and a recording unit. The rotary encoder generates a pulse signal having a period corresponding to a predetermined distance interval traveled by a vehicle. The radar controller outputs a wave every time the pulse signal is supplied from the rotary encoder. The analyzer analyzes an underground state by processing the output signal received from the radar controller. The recording unit records digital data signals and analyzes results. [A3485]

"Passive transmitting sensor"

The disclosed system comprises a receiver that is inductively coupled to one or more passive transmitters by means of a receiving inductor. The receiver comprises a sweep signal source which is coupled equally to the receiving inductor and a reference inductor. The receiving inductor is coupled to a passive transmitter which includes an L-R-C circuit comprised of a transmitting inductor, a temperature-dependent capacitor, and a resistor that may be variable or fixed, depending upon the application. As the sweep signal source passes through the resonant frequency of the passive transmitter, the passive transmitter forms a low impedance load magnetically coupled to the receiving inductor by means of the near or induction electromagnetic field produced by the inductor. Changes in the resonant frequency are used to determine temperature variation. Changes in the peak voltages are a determinant of resistor variation resulting from changes in pressure or strain, or they are a determinant of changes in proximity of the passive transmitter to the receiver, or the resistor variation resulting from changes in pressure or strain. [A3486]

"Apparatus for facilitating interconnection of antenna lead wires to an integrated circuit and encapsulating the assembly to form an improved miniature transponder device"

A method and apparatus for facilitating interconnection of antenna lead wires to an integrated circuit and encapsulating the assembly to form an improved miniature transponder device including the provision of an additional protective layer of insulation to the top of an integrated circuit chip or die and the provision of enlarged plated electrodes to the surface of the additional insulation to form enhanced bonding pads, such pads being electrically connected through the protective layers to the normal bonding pads of the integrated circuit device. The enhanced bonding pads are made of a soft conductive metal such that external wires to be attached thereto can be bonded to the pads using a thermal compression bonding technique, This invention also extends to a method of encapsulating a transponder in heat shrunk plastics material. [A3487]

"Lidar-acoustic sounding of the atmosphere"

A method of remote sensing of atmospheric conditions based on the detection of acoustic modulation of lidar returns in the atmosphere. The measured modulation is caused by density changes of the lidar scattering elements induced by an acoustic wave launched collinearly with the lidar. Applications are disclosed for measuring atmospheric humidity, cloud particle size, and temperature profiling. [A3488]

"Flap-type portal reader"

Apparatus for selectively reading or writing data on a magnetic data stripe on a data card which is thin and flexible and for selectively returning or capturing the card. The apparatus includes a card guide arrangement comprising a cylindrical card guide path section, an entrance card path section with an entrance slit for admitting the data card, and an exit path section with an exit slit for discharging the data card for capture. A drive arrangement drives the data card through the entrance slit, throughout the cylindrical card guide path section, and through the exit slit. A transducer with a read head and write head is mounted relative to the cylindrical card guide path section. A position tracking arrangement determines the position of the data card within the cylindrical card guide and a card-in sensor senses the presence of a data card in the entrance path section. A microprocessor based control circuit is used to operate the system and control operational features. [A3489]

"System for controlling a driving device of a vehicle"

A system for controlling running of a vehicle comprises a switch for setting a slow-run mode, a sensor for detecting that the brake is being applied, a driving force control device mechanically separated from the accelerator for controlling a driving force of the vehicle, a sensor for detecting the running speed of the vehicle, a switch for setting a slow-run speed command signal. A target speed is generated on the basis of information concerning the brake activation and, the running speed of the vehicle and the slow-run speed command signal value. In the slow-run mode, when the brake is not applied, the driving force control device is driven to cause the vehicle to run at the target slow-run speed, and when the brake is applied, the driving force control device is driven so that no driving force is produced at least in the direction of travel of the vehicle. [A3490]

"Two-stage target tracking system and method"

An apparatus and method for tracking maneuvering and non-maneuvering targ in the presence of stochastic acceleration are provided. The apparatus and method utilize a two-stage Kalman estimator, the first stage of which is a bias-free filter providing target position and velocity estimates, and the second stage of which is a bias filter providing estimates of target acceleration. These two filters act together to provide parallel processing calculations thereby achieving high speed target state determination. During target maneuvers, the output of the second stage is used to correct the output of the first stage. In the absence of maneuver, the second stage is turned off and the first stage provides the target position and velocity estimates. [A3491]

"Echo ranging system for detecting velocity and range of targets using composite doppler invariant-like transmissions with suppression of false targets"

False target (reverberation, clutter, etc.) detection is suppressed in an echo ranging system (sonar or radar) in which target velocity and range are measured using a composite Doppler invariant-like signal having at least two segments, such as are present in a "rooftop" or "vee" HFM signal, such composite signal having an ambiguity function with two or more ridge lines of different slopes that intersect along the zero-velocity time axis. A bank of matched filters provides a distribution of outputs which has an ambiguity function-like character with intersecting pairs of ridge lines, the intersecting points of said pairs characterizing the range and velocity of the echo returns. This distribution is adjusted so that the intersecting ridge lines of each pair have equal and opposite slopes with respect to the time axis. In particular, fixed reverberators, which would have ridge lines intersecting on the zero-velocity time axis, would be symmetrical about this axis. A target with velocity v would present ridge lines intersecting along the v-velocity time axis and be symmetrical about that axis. Thus, the reverberation and the moving target would each have crossed ridge lines whose characteristic intersecting patterns would each exhibit symmetries, but about separate and distinct axes. False targets, including clutter and reverberation, are suppressed by subtracting from the adjusted output distribution, a replica thereof, folded (rotated) 180.degree. about a time axis containing the intersection of the ridge line pair corresponding to the false target which is to be suppressed. The rotation and subtraction of the replica from the adjusted distribution provides a set of outputs from which the real target velocity and range can be determined. The rotation-subtraction process can be implemented on an on-going basis to suppress a plurality or continuum of false targets and to achieve a desired width of a Doppler notch covering an arbitrary range of velocities. [A3492]

"Echo ranging system for detecting velocity of targets using composite doppler invariant transmissions"

Target velocity and range are measured with high resolution in an echo ranging system (sonar or radar) using composite Doppler invariant signals consisting of at least two segments, such as "rooftop" or "vee" HFM signals, such composite signals having ambiguity functions that intersect along the zero-velocity time axis with ridge lines slanted in different directions. A single correlator is used for each segment wherein returns from the target are correlated with replicas of each segment of the composite signal to separately transform the Doppler frequency shifts of the target return into outputs whose time relationship provides a frame of reference for high resolution measurement of the velocity of the target. The time relationship measurement is implemented by a set of tapped delay lines and coherent summers which output a coherent correlation-like detection peak in a bin which corresponds to the target's velocity. Thus, one correlator for each transmission segment together with a tapped delay line and summer network may be used for velocity detection, with high precision range detection, based upon the timing of the detection peak with respect to the transmitted signal, also being implemented at the same time, thereby avoiding the classical need for an expensive bank of correlators (one for each velocity bin) and yielding significant economies for the simultaneous high resolution measurement of range and velocity for a target by means of echo ranging. [A3493]

"Vector neural network for low signal-to-noise ratio detection of a target"

A vector neural network (VNN) of interconnected neurons is provided in transition mappings of potential targets wherein the threshold (energy) of a single frame does not provide adequate information (energy) to declare a target position. The VNN enhances the signal-to-noise ratio (SNR) by integrating target energy over multiple frames including the steps of postulating massive numbers of target tracks (the hypotheses) , propagating these target tracks over multiple frames, and accommodating different velocity target by pixel quantization. The VNN then defers thresholding to subsequent target stages when higher SNR's are prevalent so that the loss of target information is minimized, and the VNN can declare both target location and velocity. The VNN can further include target maneuver detection by a process of energy balancing hypotheses. [A3494]

"Radio frequency automatic identification system"

A radio frequency automatic identification system detects targets which include solid resonators resonating at several frequencies, attributing information to the frequencies at which the target resonates. Preferred resonators are quartz crystals, which may be made by a process of heating quartz to soften it and cutting crystals to approximate size and resonant frequency. Resonators produced by such a process are measured to determine their actual resonant frequency, and preferably the crystals are sorted into predetermined frequency windows in accordance with their measured resonant frequency. A set of resonators having frequencies corresponding to predetermined data is selected from the sorted groups of resonators and incorporated into a target. The preferred target is an ink-like material having a plurality of resonators disposed in a matrix which is radio frequency transparent at the frequency of interest. Targets are preferably detected by repetitively sweeping the frequency of the interrogating signal through a range which includes the information-bearing range of the system. [A3495]

"Hick's probabilistic data association method"

A process, known as the Hick's Probabilistic Data Association Algorithm, correlates sensor measurement to target tracks under condition in which there are numerous false measurements. It accomplishes this by forming multiple hypotheses and computing a probabilistic score for each. The hypothesis with the high score is then used as a probability vector to update each target's track. The result is accomplished by combining the attributes of Joint Probabilistic Data Association (JPDA) and Nearest Neighbor Standard Filter (NNSF) . This combination provides an improved algorithm which yields improved performance ever both prior art methods under high clutter conditions with crossing targets. [A3496]

"Weather radar display system"

A weather radar display system and method for obtaining and storing radar return data for a plurality of horizontal and vertical sweeps, each horizontal sweep occurring at a different tilt angle and each vertical sweep occurring at a different azimuth angle. The radar return data is displayed as plan views in a plurality of separate display sections, each corresponding to a plurality of separate horizontal sweeps in one embodiment and to a plurality of separate vertical sweeps in a second embodiment. Radar return data in one display section (horizontal or vertical) is displayed with a variety of colors to represent precipitation intensity. Radar return data in remaining display section (horizontal or vertical) is displayed as a first color with edge returns displayed in second color to differentiate the remaining sections. Display sections partially overlap such that each subsequently displayed plan view is at least partially superimposed on the preceding view to give a three-dimensional image of the weather system. [A3497]

"Inflight weather and ground mapping radar"

The present invention is a radar system that corrects for changes in apparent reflectivity and two-way precipitation attenuation using a correction curve that includes a segment for low rain rates, a segment for high rain rates and, if desired, a transition segment for medium rain rates. The signal to noise ratio is further improved by using a sliding azimuth window during post detection integration processing. [A3498]

"Sensor for detecting the passage of a person or an animal in a field of view"

Both a motion detector and a presence detector receive doppler shifted reflected microwave radiation to detect the passage of a person or an animal in a field of view. The motion sensor is adapted to detect the passage of a person or an animal near a doorway and to actuate the doorway in response thereto, to permit the passage of the person or animal thereto. The presence detector detects "swaying motion" of a person or an animal in a field of view much closer to the location of the sensor as its gain is much lower than that of the motion detection channel. In addition the presence detector is activated only in the event the motion sensor is deactivated. The output signals from the motion sensor and presence sensor are gated through an OR gate and to a timer to activate the door opener. [A3499]

"Method and apparatus for transmitting electromagnetic signals into the earth from a capacitor"

A method and apparatus in which a capacitor is disposed in direct contact with the earth, and a short voltage pulse is applied to the capacitor to transmit a pulse of electromagnetic radiation having a broad frequency band into the earth. In a preferred embodiment, a portion of the electromagnetic radiation that has propagated through the subsurface is detected and processed to image the subsurface. The size, L, of the transmitting capacitor should be sufficiently small to satisfy the relation Re[kL]< 1, where k is the wavenumber in the earth formation of each frequency component of radiation transmitted into the earth. In a preferred embodiment, the voltage pulse applied to the transmitting capacitor has frequency components in a broad band from below 1 MHz to above 100 MHz, and the only frequency components of the detected electromagnetic radiation that are processed to image the subsurface have frequency in the range from about 500 KHz to 25 MHz. [A3500]

"Circuit to increase the information bit rate in a system for the exchange of data"

In a system for the exchange of data by microwaves between a fixed station and a mobile station or portable badge, the information bit rate is limited, in the standby state, by the low power consumption of the badge and the high output impedance of the modem. To increase the information bit rate of the modem of a badge, the information processing circuit associated with the modem sends the modem an activation signal to reduce its output impedance. The means implemented are transistors that switch over the load of the detector transistor or of the amplifier transistor. [A3501]

"System for sea navigation or traffic control/assistance"

A system to control sea navigation or traffic of a plurality of ships or moving bodies is disclosed. The system comprises a radio navigation reference system comprising at least two reference beacon sources and a navigation central station M. Said central station M, the reference beacon sources and the ships or moving bodies are provided with a first intercommunication means from said central station M to each reference beacon source, said first intercommunication means being synchronized by said central station M, and a second intercommunication means from said central station and each reference beacon source to each ship or moving body. The system further comprises a third intercommunication means from each ship or moving body to a control station PC, said control station PC having means making it possible, through the computation of the distances from each ship or moving body to said central station M and to each reference beacon source, provided by said third intercommunication means, to compute the position of each ship or moving body with respect to the reference radio navigation system. Said third intercommunication means being tuned on the radio navigation carrier wave. There is provided means for the real-time display of the geographical position of each ship or moving body. [A3502]

"Ranging, detection and resolving in a multislope frequency modulated waveform radar system"

A maximum likelihood estimator and range-only-initialization target detection method employed to detect and resolve targets in a multislope linear frequency modulated waveform radar. The method resolves a large number of target returns without a large amount of signal processing and without creating a significant number of false alarms, or ghosts. The method simultaneously estimates range and doppler for each target. The method rejects undesired long-range targets that fold into target regions, and processes target regions of interest around a nearest target to reduce signal processing throughput requirements. Using a K out of N detection rule, the method detects targets that compete with mainlobe rain clutter, mainlobe ground clutter, and receiver leakage. The method simultaneously estimates target parameters and optimally resolves any number of targets. The method is limited only by the number of frequency modulation ranging slopes, the slope values, and the doppler filter resolution set by the radar waveform design. The method has the ability to process and detect extended targets. [A3503]

"Doppler frequency spectrum de-emphasis for automotive collision avoidance radar system"

A Doppler control circuit for a CW or pulse Doppler radar system for monitoring not only the phase shift between echo signals from several targets but also the amplitude difference between the several targets and to further tune the radar to a particular target among one or more targets from which echo signals return. The control circuit can be used in state of the art CW or pulse Doppler type radar systems. In a further system, a special circuit is provided for conditioning selected portions of the Doppler frequency spectrum to attenuate or de-emphasize portions of the echo signal corresponding to selected targets in the radar system environment, such as rain or stationary wayside objects, in order to give such echo signals less weight in determining roadway hazards. [A3504]

"Forward looking radar"

In a forward looking radar in which from flying or stationary carriers land or marine surfaces in a forward lying sector region are imaged two-dimensionally, an antenna mounted rigidly on a carrier is made up of a plurality of individual elements preferably in the form of horn antennas arranged rectilinearly adjacent each other and in two rows above each other in such a manner that for a predetermined aperture length l of each individual element and for a predetermined spacing of the individual elements the antenna has an antenna length L=n.l/2. By means of the individual elements in each case a transmitting and subsequently a receiving takes place consecutively from the first to the last of the plurality of individual elements. To implement a digital coupling of the individual elements each said element is evaluated separately digitally and by correlation of a specific predetermined reference function a digital processing is carried out for each angular region. [A3505]

"Interactive television and data transmission system"

A spread spectrum system provides bidirectional digital communication on a vacant television (TV) channel for simultaneous use by more than 75,000 subscribers using time and frequency division multiplex signals locked to horizontal and vertical sync pulses of an adjacent channel Host TV station. The system, whose operation is analogous to a radar system, comprises (1) the Host TV station to send down-link sync and data pulses to subscribers during the horizontal blanking interval (HBI) , (2) subscriber "transponders" which detect those signals and transmits up-link "echo" data pulses only during the HBI to eliminate interference to TV viewers, and (3) a central receiver which also uses the host TV sync pulses to trigger range gates to detect the up-link data pulses. In a preferred embodiment the central receiver employs directional antennas to determine direction to transponders and to define angular sectors partitioning the service area into pie-link "cells" which permit frequency re-use in non-contiguous sectors (like cellular radio) . The system thus operates like a radar to measure elasped time between receipt of TV sync pulses and receipt of transponder response pulses and measures bearing to transponders to thereby determine the location of fixed or mobile subscribers as well as provide data links to them. Transponders may share user's existing TV antenna or may operate on cable TV and could be packaged as "RF modems" for personal computers, as transceivers for mobile or portable use, or they may be integrated with a TV receiver to provide "interactive television". [A3506]

"Sea velocity evaluator"

Sea clutter can be removed from radar signals by accurately determining sea velocity in a coverage area of a radar scan, updating a median value for the coverage area, and selecting a clutter rejection filter for the coverage area biased on the median value for the coverage area. Preferably, a median sea velocity is stored for each coverage area, as the median value. When processing begins for a coverage area, a previously stored median sea velocity is retrieved and updated. The median sea velocity is updated by converting the median sea velocity into a median phase difference between two echo signals, based upon carrier frequency and the time between receipt of two echo signals, which is preferably more than one interpulse period. The difference in phase between the two echo signals is compared with the median phase difference and the median sea velocity is increased if the median phase difference is smaller and decreased if the median phase difference is larger. A rejection filter is selected based upon the previously stored median sea velocity (preferably after adjustment based on the carrier frequency) to remove the echoes from the sea from the radar echo signals. [A3507]

"Telemetric process for measuring short distances"

A telemetric process for measuring short distances comprises emitting an electromagnetic signal modulated by a pseudo-random sequence having a number (n) of bits delivered at a clock frequency (fH) , correlating the echo detected with the modulated signal time-delayed by known means, and varying the clock frequency, as a function of the correlation measurement, within an operational field divided into a plurality of operating ranges, the number of bits inthe pseudo-random sequence being modified accoridng to the operating range of the clock frequency. The process is particlualry useful for proximity measurement close to a reflecting surface. [A3508]

"Downdraft velocity estimator for a microburst precursor detection system"

A weather surveillance apparatus utilizes a set of beams in an elevation angular sector, one beam being offset from the other by a predetermined offset angle. Radar signal returns in each beam are processed to establish an average doppler frequency shift for the signals in the respective beams. An average of the averages and a difference of the averages are determined which are utilized to establish horizontal and vertical wind velocities. These velocities are further processed to determine whether a microburst precursor exists and the location, magnitude, time to impact, and track of any resulting windshear. [A3509]

"Automatic vehicle deceleration"

An unobtrusive vehicular adaptive speed control system controls vehicle traveling speed in response to sensed obstacles preceding the vehicle, to driver influenced control parameters, and to a desired travelling speed set by the vehicle driver. [A3510]

"System for automatic identification of rail cars"

A system is provided for automatic identification of objects, such as rail cars and the like, utilizing two transponders, each attached to the rail car by a bracket. The bracket, which is welded along its ends to the rail car, has a lower planar surface which is placed against the side of the rail car when the bracket is welded thereto. A bottom planar surface of the transponder mates with an upper planar surface of the bracket, thus ensuring a good conduction heat flow path to the rail car and preventing over heating of the transponder when the rail car is placed in a thaw shed. The transponder is attached to the bracket by inserting a flange formed one end of the transponder under a clip projecting from the upper surface of the bracket. A threaded stud projecting upward from the bracket upper surface extends through a hole in a second flange formed at the other end of the transponder. The controlled length of the stud, and the use of an acorn nut and conical washer threaded onto the stud to clamp the transponder to the bracket, prevents generating excessive clamping force. [A3511]

"Radar tracking system having target position dead reckoning"

A vehicle mounted radar tracking system monitors vehicle heading rate, vehicle heading acceleration, vehicle roll rate and vehicle pitch rate, and provides a turn detect signal in response to heading rate, heading acceleration, roll rate or pitch rate being in excess of corresponding enable threshold magnitudes. In response to the turn detect signal, the tracking system dead reckons the positions of targets being tacked, and tracking system parameters are varied to make it more responsive to target motion. The turn detect signal is removed in response to heading rate, heading acceleration, roll rate and pitch rate being less than corresponding disable threshold magnitudes, and the tracking system is returned to normal operation. [A3512]

"Azimuth correction for radar antenna roll and pitch"

A vehicle mounted radar system has an antenna (12) which rotates about a reference axis (19) . During angular movement of the antenna with respect to the reference axis, a radar indicated target azimuth (.phi.') is modified to provide a corrected target azimuth (.phi.) which is substantially indicative of the actual or true target azimuth. A tracking system (25) uses a predicted radar indicated target position (P.sub.n+1 (x,y)) for target tracking and correlation. The tracking system uses a smoothed target position (STP (x,y)) , indicative of actual target position, for providing a visual display (39) of target track. [A3513]

"Method for extracting motion errors of a platform carrying a coherent imaging radar system from the raw radar data and device for executing the method"

For the imaging of terrains with varied ground reflectivity, azimuth spectra continuously following each other in time are formed over a set period of time in a method for extracting motion errors of a platform carrying a coherent imaging radar system from raw radar data. By determining the position of the maximum of the correlation between two azimuth spectra formed immediately following each other in time, the frequency shift of the ground reflectivity part is obtained. Then a separation of a velocity V.sub.v (t) in the forward direction from an acceleration V.sub.b (t) in the direction of LOS of the antenna is performed by filtering and the acceleration V.sub.b (t) obtained is subjected to normalization after two-fold integration, by means of which the displacement in LOS, i.e. the motion errors in the line of sight direction of the antenna, is obtained. In contrast to GPS systems, all information is taken from the raw radar data and no ground station is required, so that the present method can be used much more flexibly and is more self-sufficient. Furthermore, in comparison with the autofocus method, the present method has a much greater band width and can be performed in real time, which cannot be realized with the autofocus method. [A3514]

"Automatic safety driving distance control device for a vehicle"

Disclosed is an automatic safety driving distance control device for vehicle. The device includes a microcomputer which, within the range of 0-120 km/hr, can adjust the safety distance between the vehicle and the front vehicle according to the speed data transmitted from the speedometer and can automatically control the speed of the vehicle to maintain a safety distance from the front vehicle so as to avoid collision. When the vehicle is moving, the microcomputer calculates the safety distance between both vehicles according to the speed of the vehicle and the actual distance from the front vehicle according to the data from the distance detector. If the distance is too short, it will automatically motivate the brake motor to cause the vehicle to decelerate and the brake lights to turn on, if the distance is too great, it will automatically motivate the accelertion/deceleration motor to cause the vehicle to accelerate so that a safety distance is kept between both vehicles. If the front vehicle stops, then the brake motor and acceleration/deceleration motor will be motivated to stop the vehicle. If the front vehicle moves forward, the acceleration/deceleration motor will also be motivated, and the vehicle moves forward, keeping a safety distance from the front vehicle and maintaining a safety speed according to the value set by the speed limit device. [A3515]

"Turbulence radar system"

The present invention is a radar system that detects turbulence by breaking a range cell return down into spectral segments using an FFT processor. The standard deviation of the spectrum is determined and the system compares that standard deviation to a reference threshold of a non-turbulent return if the signal is above noise. If the threshold is exceeded, the range cell is marked for turbulence display. Once the turbulence display is completed it is overlayed on the weather display. To improve matching of the feature size to the variance calculation the invention performs both range and azimuth post detection integration subsequent to the FFT but before variance calculation. [A3516]

"Display system for a head mounted viewing transparency"

A display system for conventional eyewear having a transparency that defines a field of view and a frame for supporting the transparency on a user's head is shown. The display system includes a light transmissive display mounted on the frame of the eyewear and optics for collimating light to project an image of the displayed information at a distance from the user in the periphery of the field of view defined by the transparency. The optics may include a single mirror that receives the information directly from the display wherein the mirror is toroidal or the like so as to project an enlarged image at an apparent optical distance from the user that is greater than the actual optical path. Alternatively, a planar mirror may be employed with a collimating lens to project the image at a desired distance from the user. The mirror may be fully reflective or partially reflective so as to superimpose the image of the displayed information on the scene viewed by the user through the transparency of the eyewear. Further, means are provided for automatically adjusting the optical path defined by the relative position of the mirror, the display and the user's eye to accommodate heads of various sizes. [A3517]

"Safe trailing distance warning for vehicles"

A device and method to avoid collisions is described herein. The invention is primarily directed to preventing tail-gating by motorists. The method and device may also be utilized to detect stationary objects and to alert the driver of a vehicle of an imminent collision. [A3518]

"Movable storage system with aisle monitoring apparatus"

A detection system is disclosed for a mobile storage system which causes the storage system to prevent movement of a storage element whenever a person is detected in an aisle between storage elements. The detection system uses a presence or motion detector for detecting the presence of a person in an open aisle without direct contact between the person and the detection system. Preferably, a radar transceiver operating in X-band is positioned to overlie each open aisle to detect presence of movement of a person in an open aisle, even slight movement such as breathing. The storage system in which the detection system is connected prevents any closing movement of a storage element adjacent an aisle in which a person is detected so as to avoid frightening the person in the aisle. [A3519]

"Traffic speed radar unit"

An improved traffic speed radar unit, operating on the conventional doppler system, is disclosed wherein the unit includes means to verify that the internal time base frequency used to calculate vehicle speeds has not changed. Also, electronic memory is added both to facilitate an officer's work in taking notes and to allow for a more complete unit history to be maintained. [A3520]

"Proximity identification system with flux concentration in operating region"

A proximity identification system incorporating ferrite rods. The rods are used in both the reader and the tag and additional rods may be used to strengthen and concentrate the flux field in the regions near the reader to obtain better performance in such regions. A coding system requiring minimum power for the tag is also described. [A3521]

"Method and apparatus for calculating motional characteristics"

For calculating motional characteristics, particularly of a projectile moving in a barrel of weapon, a microwave directed onto the projectile by a measuring structure is superimposed with the reflected wave and a a calculation of location-dependent velocity and acceleration is carried out based on the chronological curve of the phase difference by a one-time or, respectively, two-time differentiation. In order to reduce measured errors, the operating phase difference and, therefore, the location of the projectile is first assigned to each amplitude value in a registered interferometer signal. A compensation function for the time-dependent location of the projectile is then placed through the arc-cosine-transformed individual action points and the location-dependent projectile velocity is calculated by one-time differentiation and the acceleration is calculated by a further differentiation. [A3522]

"Field disturbance monitor system"

A field disturbance monitor system which senses changes in a reflected signal caused by animate objects compared to inanimate objects in the same zone. The system employs a microprocessor which controls the system. A transmitter transmits a pulses microwave signal in response to a control signal from the microprocessor. A receiver receives a return signal which represents a reflection of the transmitted signal. A sample and hold circuit senses and holds the magnitude of the pulsed signal. Analog to digital conversion is obtained, whereby a ramp generator generates a ramp voltage which is compared with the magnitude of the received signal by a comparator. The microprocessor measures the time it takes the ramp voltage to rise to the magnitude of the detected signal. The microprocessor continuously computes a recursive short term average and compares this average value with a recursive long-term average. Deviations between the two time periods are the result of a disturbance within the monitoring field. Furthermore, the system is continuously self-adjusted to allow the conversion process to occur within the bounds of the measurement circuit, by changing the gain applied to the detected signal. [A3523]

"Precision ranging system"

The range (R) to a target (12) is precisely determined by controlling the amplitude of the carrier before modulation using a feedback signal derived from the detected return. The amplitude of the carrier is adjusted (40) so that all return pulses have a constant amplitude. Hence, for any given range, all return pulses cross threshold at the same time, thereby eliminating ranging errors due to phase distortion. The return pulses are threshold detected (54) and converted to a CW signal, which is then down converted. The phase information, which is indicative of target range, is preserved in the down conversion process and is extracted by phase comparison (72) with a reference signal to determine the target range. [A3524]

"In-furnace level meter and antenna therefore"

An in-furnace level meter for measuring a slag level, or the like, in a convertor, and an antenna used therefore. An antenna position is controlled so that the distance between the antenna inserted in the convertor and the slag level can be established to be constant or within a predetermined range. A water-cooled structure antenna is used as the antenna. [A3525]

"Measuring device"

The invention relates to a device and process which utilize the Doppler effect for measurement of the performance of blasting operations, in particular to the measurement of face velocity. The measuring device comprises radiation generating and receiving means and a signal analyzing means. [A3526]

"Electronic vehicle toll collection system and method"

A system for automatic collection of tolls includes a toll facility, an in-vehicle toll processor having memory for storing a toll-money-available quantity purchased by the user, and a toll-facility-identification site that transmits a toll-facility-identifier signal indicating the identity of the upcoming toll facility and the toll to be collected. As the vehicle approaches the identification site, the in-vehicle processor receives the identifier signal and calculates the toll to be debited. When the vehicle passes through the toll facility, the facility transmits a toll-collect signal instructing the in-vehicle toll processor to debit the calculated toll from memory. The in-vehicle processor debits the calculated amount and transmits an acknowledgement signal to the toll facility. [A3527]

"Vehicle mounting apparatus of an automatic vehicle location system"

A vehicle mounting apparatus for an automatic vehicle location system having a omni-directional antenna, a transmitting and receiving switch, an oscillator frequency converters, a frequency-shift keying demodulator, post office committe standard associate group decoder, a pseudorandom noise signal generator, a phase-shift keying modulator, a transmitting signal generator, a power amplifier, and a power supplier. The vehicle mounting apparatus receives a referencing signal from a control center and transmits an answer signal relating to location of a vehicle to be located. [A3528]

"Oblique spaced antenna method and system for measuring atmospheric wind fields"

Oblique spaced antenna method and system for measuring atmospheric wind fields within a predetermined volume, wherein a pulsed beam of high frequency radar waves is transmitted in predetermined transmitting directions into the volume of the atmosphere to be investigated, parts of the radar waves which return from the volume to be investigated are received from predetermined receiving directions at a plurality of spaced receiving locations, and the received waves are processed to derive information about the wind velocity within the volume to be investigated, to allow direct determination of parameters of the wind field, such as divergence, vorticity etc. The transmitting and receiving directions are oblique with respect to the vertical direction. [A3529]

"Near range obstacle detection and ranging aid"

A range detection apparatus comprising means for generating high frequency energy over a finite frequency range and for frequency modulating over a limited range of bandwidth the generated signal. A first path provides a phase reference while a second path provides for transmitting and receiving the signal. Along one of the two paths, the frequency modulated signal is phase shifted at a plurality of predetermined frequency values over a finite frequency range of bandwidth and at a predetermined plurality of phase-shifting values (greater than two) and at combinations of phase-shifting and frequency values to improve the relative range resolution. The signal in one path is phase compared to the signal in the second path to produce range measurement signals related to the combined phase shifts of the two paths, the results of the phase comparison, and the combinations of phase states of the phase shifts and frequencies of the frequency modulated signal. [A3530]

"Forward looking radar"

In a forward looking radar in which from flying or stationary carriers land or marine surfaces in a forward lying sector region are imaged two-dimensionally, an antenna mounted rigidly on a carrier is made up of a plurality of individual elements preferably in the form of horn antennas arranged rectilinearly in a row adjacent each other in such a manner that for a predetermined aperture length l of each individual element and for a predetermined spacing of the individual elements the antenna has an antenna length L=n.multidot.l. The transmission is incoherent from a single element and thereafter simultaneous reception is effected with the remaining individual elements. To implement a digital coupling of the individual elements each said element is evaluated separately digitally and by correlation of a specific predetermined reference function a digital processing is carried out for each angular region. [A3531]

"Ultrasonic level detector"

An ultrasonic level detector includes a transducer for generating and receiving bursts of sonic energy at a surface to locate the position of the surface. In response to receiving a burst of energy reflected from the surface, the transducer generates an electrical signal, which is then supplied to a variable gain amplifier. After amplification, the electrical signal is supplied to a comparator and a peak detector. The comparator generates a timing signal upon the electrical signal exceeding a threshold. A window generator circuit generates a receive window that controls whether the electrical signal is supplied to the comparator and the magnitude of the threshold on the comparator. The peak detector determines the maximum amplitude of the electrical signal, which may be used to vary the amplifier gain and the number of pulses included in an excitation signal which drives the transducer. Upon receipt of the timing signal, a microprocessor determines the distance between the transducer and the detected surface. [A3532]

"Microburst precursor detector utilizing microwave radar"

A microburst precursor detector utilizes a multiplicity of radar beams and samples radar returns, in each beam, from meterological radar signal reflectors and processes the signal returns in a statistical manner to determine average radar reflectivity and to extract doppler signal parameters. These parameters are utilized to determine a second set of parameters, average doppler frequency within each radar beam, doppler spectral spread within each radar beam, and the skewness of the doppler spectrum in each beam. The second set of parameters is processed to establish the existence of a microburst, predicted surface impact, time to impact, wind shear surface location and track, and the magnitude of the wind shear. [A3533]

"Subsurface target identification radar"

Subsurface target identification radar includes an antenna array, a rotary encoder, a radar controller, a polarization switching circuit, and transmitter and receiver circuits. The antenna array is constituted by dipole antennas having plane triangle elements. The antennas are disposed at angular intervals of 120.degree. with respect to a rotated symmetric point of the array. The rotary encoder generates a distance pulse every time the radar travels a presetted distance. The radar controller sequentially generates three switching pulses within one period on the basis of the distance pulse from the rotary encoder. The polarization switching circuit selects an arbitrary dipole antenna as a transmitting antenna from the antenna array, selects an arbitrary dipole antenna, other than the selected antenna, as a receiving antenna, and changes a combination of selected antennas every time the switching pulse is generated by the radar controller. The transmitter and receiver circuits transmit/receive electromagnetic waves through the selected antennas. [A3534]

"Communicating information by radio"

Information is communicated by microwave radio between transponders (9,10) carried by vehicles (7,8) travelling on a road (1) and a station (22) adjacent the road. The communications from the transponders are effected by the transponders suitably modulating their reflections of beams of microwave energy transmitted by the station from aerials (B) mounted on a gantry (11) above the road, these aerials irradiating respective communication areas (28,29,30) . In order to prevent communications from different transponders overlapping and hence interfering with each other the transponders are enabled for their communications by microwave energy from further aerials (A) , which energy has a higher frequency to enable it to be beamed at relatively small respective activation areas (23-27) the sizes of which are such that they can each only contain one vehicle and hence one transponder at any given time. The further aerials are activated, one at a time, successively and cyclically, so that the transponders are necessarily enabled in succession, the activation rate being, moreover, sufficient to ensure that all transponders passing through the relevant stretch of road are in fact enabled. During each interval between the activation of each further aerial and the next the station transmits a command from the aerial (s) (B) associated with the further aerial (A) which has just been activated ordering any transponder which has just been enabled to communicate its presence. If it receives such a communication the station transmits an address code from the relevant aerial (s) (B) which is stored in the relevant transponder and used subsequently to selectively address that transponder for further communication. [A3535]

"Method and apparatus for detecting fire, explosion, and/or projectile penetration"

A method and apparatus for detecting the occurrence of a fire or an explosion in a monitored space, or the penetration of a projectile through a barrier, by: transmitting to the monitored space an electromagnetic signal of at least one radio frequency, receiving the transmitted signal as scattered by the monitored space, and analyzing at least one parameter of the received signal to produce an indication whether a fire or explosion has occurred, or a projectile has penetrated through a barrier, in the monitored space. [A3536]

"Method and apparatus for ground radar information display system"

Disclosed herein is a method and apparatus for a ground radar and information display system for commercial and general aviation. The method includes processing raw data from the presently existing ATCRBS system, duplicating the raw data and sending it to an auxiliary computer, filtering out non-positional messages of the raw data, encoding the raw data into a data block and transmitting the data block to a display facility, where it is decoded and displayed. The apparatus of the invention includes and auxiliary ground computer and a smaller on-board computer for processing the data block. [A3537]

"Vehicle air bag protection system"

A vehicle air bag passenger protection system that includes switches in the vehicle bumpers. Control signals are generated by the switches to produce rapid inflation of air bags in the passenger compartment of the vehicle. As a further protective feature, a distance measuring system is provided for generating an alarm signal when the vehicle is moving at a significant speed, and another vehicle is so close as to present the possibility of a collision situation. [A3538]

"Method of and apparatus for obtaining vehicle heading information"

When fewer than three of the satellites of a satellite global positioning system (GPS) such as NAVSTAR are visible to a user (15) , the user cannot obtain independent positional information from the system. Since a satellite (11) in such a system is moving with respect to a user (15) , its signals are received with a Doppler offset from their normal centre frequency and the frequency offset due to the satellite motion alone is calculable for a user at an approximate location from a given satellite. An additional Doppler frequency offset will result from any movement of the user. The magnitude of the additional frequency shift, in conjunction with the known speed (m) of the user, can be used to calculate the angle between the satellite motion (V.sub.1) and the user's motion and since the direction of the former is known, the user's heading from local North (N) can be calculated in instances where only one or two GPS satellites (11,12) are visible to a user. [A3539]

"Microwave responder"

A microwave responder resonates or does not resonate with a microwave transmitted from a radio transmitter, and radiates the resonated microwave as a response signal wave. Two microstrip lines are linearly arranged to be separated from each other at a predetermined interval. A diode which is switched between ON and OFF states in response to the response signal is interposed between two end portions of the microstrip lines separated by the predetermined interval, and a distance, between distal ends of the two linearly arranged microstrip lines, which includes an impedance defined by the ON or OFF state of the diode is determined to be 1/2 a wavelength of the microwave. [A3540]

"Method and apparatus for protecting motor vehicle occupants"

In a process for protecting motor vehicle occupants, the acceleration of the motor vehicle is determined and safety means which protect the motor vehicle occupant are activated when a specified limiting acceleration value is exceeded. To optimally release the safety means, the sitting position of the motor vehicle occupant and/or the relative velocity of the occupant with respect to the passenger cabin of the motor vehicle are determined by position sensor using measuring techniques. The safety means are activated when the sitting position of the occupant deviates from a nominal position and/or the relative velocity of the occupant exceeds a specified limiting value. [A3541]

"Single substrate microwave radar transceiver including flip-chip integrated circuits"

A microwave radar transceiver assembly (30) includes a monolithic microwave integrated circuit (MMIC) chip (58) having a coplanar waveguide transmssion lines (100, 102, 104) formed on the same surface (58a) as the electronic elements thereof. Coplanar waveguide transmission lines (68, 70, 72) are also formed on a surface (62a) of a substrate (62) . The transceiver chip (58) , in addition to other chips (56, 60) , are mounted on the substrate (62) in a flip-chip arrangement, with the respective surfaces (58a, 62a) on which the transmission lines (100, 102, 104, 68, 70, 72) are formed facing each other. Electrically conductive bumps (106, 108, 110) are formed on portions of the transmission lines (100, 102, 104) of the chips (56, 58, 60) which are to be interconneced with the transmission lines (68, 70, 72) of the substrate (62) , and solder (114) is formed on the portions of the transmission line (68, 70, 72) of the substrate (62) which are to be interconnected with the transmission lines (100, 102, 104) of the chips (56, 68, 60) . The bumps (106, 108, 110) provide spacing between the mating surfaces (58a, 62a) of the substrate (62) and chips (56, 68, 60) , and isolation between electronic elements on the chips (56, 58, 60) . [A3542]

"Easily encodable surface acoustic wave (SAW) security devices"

This invention features a method for encoding surface acousting wave (SAW) delay lines. The method uses a split-electrode transducer as a programmable reflector. When shorted out, it does not reflect surface waves. When open-circuited, it partially reflects incident surface waves. As manufactured by conventional photolithographic methods, each of several such transducers is shorted out by a fusible link. In the as-manufactured state, the array of shorted transducers produces no reflection of surface waves. If a fusible link is destroyed by passage of electric current or other means, the corresponding transducer becomes a partial reflector. The status of these switchable reflectors may be read by exciting a separate launch transducer with a burst of electromagnetic energy containing substantial energy at the basis operating frequency of the SAW transducers or at suitable harmonics. SAW energy reflected by the switchable reflectors appears at the same transducer at delay times determined by the spacing of the elements. The presence of a pulse at a given delay time indicates that the corresponding fusible link has been destroyed, conversely, absence of the pulse indicates that the fusible link is intact. Thus, destruction of fusible links provides a method for encoding SAW devices for security and other applications, in situ. [A3543]

"Method for using seismic data acquisition technology for acquisition of ground penetrating radar data"

A method and apparatus are used in the acquisition of data by ground-penetrating radar, wherein the signals thus obtained are input to a pre-amplifier which contains filtering component such as an anti-aliasing filter. The base gain of the system is switch selectable and electronically adjusted to bring the input signal to between one half and full scale on an analog to digital converter input. The converted digital value has a resolution of fifteen bits for processing. [A3544]

"Satellite-based position determining system"

Disclosed herein is a transmission system for determining a position of a mobile station by using communication satellites. The determination of the position of the mobile station is effected by one-line signal transmission from the mobile station through one satellite to a fixed station and by two-line signal transmission from the fixed station through two satellites to the mobile station. Thus, the construction of the transmission system can be made simple such that a transmitter for the one-line signal transmission needs to be mounted on the mobile station. [A3545]

"Resonant tag and method of manufacturing the same"

A resonant tag is manufactured in the manner described below: a conductive thin film is formed to a predetermined thickness on two surfaces of an insulating thin film. Thereafter, a conductive pattern, composed of an inductor element and a capacitor element corresponding to a resonant frequency of a resonant circuit, is printed on a surface of one of the conductive thin films, and a conductive pattern, composed of a capacitor element corresponding to the resonant frequency of the resonant circuit, is printed on a surface of the other insulating thin film at a position which faces the capacitor element formed on one of the conductive thin films using an ink which resists etching. A non-printed portion of the conductive thin films is removed by etching to form a resonant circuit pattern. Thereafter, a portion of the insulating thin film, which corresonds to the capacitor element pattern, is thinned to a desired thickness by pressing a heating/pressing member heated to a predetermined temperature against that portion under a predetermined pressure for a predetermined period of time. [A3546]

"Method and apparatus for increasing a radar's range with improved scan-to-scan integration of doppler filtered signals"

Method and apparatus for improving detection ranges of a pulsed radar sys wherein electromagnetic return signal data in range cell order is doppler filtered, digitized and stored in doppler memory channels over multiple scans of an azimuth. The digital doppler data in each doppler memory channel is scan-to-scan integrated over a predetermined number of scans to produce target displays for each possible velocity. The target displays are stored in a velocity memory, which is partitioned into velocity channels, each velocity channel corresponding to one possible velocity. A selector selects the target display having the largest total magnitude as a display signal. The scan-to-scan integrated target displays are not subject to collapsing losses since only target signals plus noise signals will be stored in the doppler memory channel corresponding to the target's velocity. [A3547]

"Lobing system"

The radar system includes a sum and difference network coupled to a conventional monopulse type antenna. The difference signals or error signals are applied into a modulator in space quadrature with electrical vectors in a direction transverse to the direction of propagation polarized at right angles to each other. A rotating magnetic field in the modulator causes any energy that is in line with this field to be continually rotated and applied to a coupler that is sensitive. During search the shutter is closed so that only unmodulated sum energy is passed through the circulator to the receiving unit. for tracking the shutter is opened and the reflecting post is positioned to reflect a selected portion of the error signal energy and pass a selected portion of the sum signal energy, both of which are absorbed in the isolator. The system provides a simplified selection of the lobing frequency by controlling the velocity of the rotating magnetic field at the modulator. The system also operates in a terrain avoidance mode by properly controlling the modulator. [A3548]

"FMCW/2FD implementation for vehicle near obstacle detection system"

A vehicle near obstacle detection system includes a plurality of radio frequency heads that can transmit and receive both frequency-modulated, continuous wave and two-frequency Doppler radar signals, such that the system operates in frequency-modulated, continuous wave radar mode and in two-frequency Doppler radar mode. The radio frequency heads used for transmitting the radar signals transmit their radar signals in accordance with commands from a system controller. The radio frequency heads are provided at various locations on the vehicle, directed at points around the vehicle which cannot easily be seen by the vehicle operator. The system controller switches between the two radar modes depending on which one is more appropriate to make use of one mode's strengths while avoiding the other mode's weaknesses. When there is no relative movement between objects and the vehicle, the frequency-modulated, continuous wave mode is used. When there is relative movement and the accuracy warrants it, the two-frequency Doppler mode is used. [A3549]

"Vehicle with plastic suspension"

Four wheeled vehicle supporting a ground probing radar antenna 52 has an aluminium alloy square plate 10 and four wheel mountings 14 supported by four pairs of equal-length arms 18,20. The arms as seen in plan are arranged in a square. One arm 18 in any pair extends lengthwise of the vehicle from an anchorage 30 on the vehicle to a mounting 14 and the other 20 extends transversely of the vehicle from an anchorage 32 on the vehicle to the mounting 14. Each mounting carries a buffer 36 which on upward movement presses against one of two spring arms 38 carried by mountings 42, one arm being locked in its mounting. The vehicle has an overcover 70 and an undercover 72. In a modification pneumatic spring units instead of arms 38 control vertical wheel motion. [A3550]

"Distance measuring method and apparatus therefor"

A distance measuring method and apparatus in which first and second pseudo random signals which are the same in pattern but slightly different in period are generated to obtain a correlation output of the first and second pseudo random signals before transmission thereof as a reference correlation output, and the first pseudo random signal is directly transmitted toward a target or alternatively a carrier wave is modulated by the first pseudo random signal and transmitted toward the target. A correlation output of the signal reflected and received from the target and the second pseudo random signal is detected and the distance to the target is measured from the time interval between the reference correlation output and the received correlation output. Alternatively, the modulated carrier wave reflected and received from the target and the second pseudo random signal are subjected to correlation processing to detect a correlative modulated carrier wave and the correlative modulated carrier wave is subjected to orthogonal detection by a reference carrier wave thereby obtaining a target detection output. Then, the distance to the target is measured from the time interval between the reference correlation output and the target detection output. [A3551]

"Radiometer system incorporating a cylindrical parabolic reflector and minimum redundancy array feed"

A radiometer system is disclosed, the system incorporating a cylindrical parabolic reflector and a plurality of radiation sensors disposed along the focal line of the reflector in a minimum redundancy array. Digital processing circuitry is connected to the output of the sensors for digitally processing signals using a cross-correlation signal processing and fast Fourier transform circuitry to generate image signals, the system providing reduced weight and increased signal integration time. Several embodiments of the system are disclosed including analog and digital versions having a multiplicity of antenna configurations. [A3552]

"Electromagnetic identification and location system"

An electromagnetic identification and location system is described. The system comprises at least one interrogator which, in operation, generates an electromagnetic interrogation field by at least one antenna coil, and at least one responder which, in response to the electromagnetic interrogation field, generates a code signal in accordance with a binary code stored in a code circuit of the responder. The code signal can be recognized by an identifier. According to the invention, the responder is provided with a generator which, in response to the interrogation field, generates and transmits a pilot signal. The system further includes a position-sensitive antenna arrangement for receiving the pilot signal. [A3553]

"Method and device for assisting terrestrial vehicle traffic"

A method for assisting terrestrial vehicle traffic involves equipping at least some vehicles with a radar system and a transponder capable of re-transmitting with selected frequency transposition any radar wave received within a predetermined frequency band. The radar system semi-continuously transmits the waves capable of measuring a distance over a range of several hundreds of meter, and the radar system receives the transposed echoes in order to carry out distance measurement thereon. It is also possible to provide certain bodies, not equipped with radar, with individual transponders which are different from those provided on vehicles. [A3554]

"Radar"

To provide stationary or mobile radar with the capability of measuring the true range profile, a radar system includes a voltage oscillator coupled to a duplexer via a pulse modulation circuit. A digital control circuit provides a sweeping 500 Mhz frequency (F) of 6N successive batches of pulses being incremented in steps of F/6N. Returns received in response to each transmitted pulse are then combined in a mixing circuit with the signal from the local oscillator to generate a signal IF, each signal is summed with signals for the same range cell derived from earlier pulses transmitted at the same frequency, thereafter the signals pass through a FFT circuit. To maintain the "dissected" spectrum centered at the 2N.sup.th cell, respective summations are carried out in two circuits, and then differenced in and normalized by the total signal energy present in the true profile range obtained from a summing circuit, the output therefrom providing an error signal whose magnitude and sign are used to estimate any change required in the value of prf, fr, thereby to achieve the value of T which will maintain the dissected spectrum centered on the 2N.sup.th range cell. [A3555]

"Collision avoidance system"

A collision avoidance system providing to each properly equipped vehicle an indication of the locational direction, heading, and relative velocity of other similarly equipped vehicles or stationary objects. Each vehicle in the system is equipped with a transponder module which transmits information data relating to that vehicle, and receives information data relating to the other similarly equipped vehicles. A central reference time signal transmitter is provided for transmitting a reference timing signal which effectively synchronizes each of the transponder modules. Upon receiving the reference timing signal, the transponder module subsequently transmits information data relating to that particular vehicle. Each of the transponder modules is allocated a unique time period for transmission of its information data. Thus, the system can accommodate a great number of transponder modules within the system, each transmitting their respective information data during unique time slots during a relatively small time frame. [A3556]

"Azimuth-stacked radar method and apparatus"

An azimuth-stacked radar method and apparatus of the type typically used for surveillance employs a mechanically-rotating antenna comprising horizontal end-fed rows of antenna radiating elements with phase shifter control on each row together with a monopulse elevation manifold to generate an elevation sum and difference beam pair. Additionally, this radar employs a waveform comprising multiple subpulses at different frequencies with sufficient separation between the subpulses at each frequency to spread them in azimuth to form a beam cluster and employs mechanical antenna rotation and phase-responsive elevation scanning. The scanning is accomplished in a way that will permit advantageous avoidance of ground clutter and other uninteresting radar reflectors. [A3557]

"Hybrid clutter cancellation method and system for improved radar performance"

A system is disclosed for use with radar systems so as to reduce the dynamic range requirement of the analog to digital converter through analog clutter cancellation prior to digitization. Clutter return estimates are formulated via modern digital signal processing techniques, converted to analog representation, and subtracted from the received waveform. Typically, the MTI cancellation is performed on the quadrature components of the received signal. The complex residue is then processed for target detection. This quadrature processing is not illustrated in the figures. In practice, sampling the received waveform prior to baseband down conversion, at an intermediate frequency, is also feasible. Digital synchronous detection and coherent MTI processing are then implemented in the digital signal processor. Rather than employ a radar signal processor which is either all analog or all digital it is beneficial to utilize hybrid schemes which capitalize on the advantages of both. A hybrid system is disclosed in which the acoustic delay line, which fundamentally limits analog MTI canceller performance, is replaced by a digital delay line. In effect, the transmitter crystal, delay medium, and receiver crystal are replaced by the analog to digital converter, digital delay, and digital to analog converter. The hybrid clutter canceller with digital processor and analog waveform synthesizer utilizes modern signal processing techniques to estimate the clutter return which is subtracted from the incoming analog signal. The full dynamic range of the received signal is not presented to the analog to digital converter, reducing the number of bits required for target detection in clutter. In effect, application of the hybrid clutter canceller reduces the A/D converter probability of saturation for a given A/D converter. [A3558]

"Road surface sensing system for a vehicle"

A system for sensing road irregularities from a vehicle modifies an operational system of the vehicle, such as a suspension system, according to the type and severity of the sensed irregularity. The system employs a Doppler Microwave radar sensor arranged to project radiation at a road surface ahead of the vehicle and includes means for detecting radiation reflections of which the carrier frequency is amplitude modulated according to the surface irregularities. An electronic circuit differentiates the modulated signal to produce a control signal representative of said surface condition and a controller receives said signal and modifies the operation of the vehicle system in response thereto. [A3559]

"High speed system for reading and writing data from and into remote tags"

A system for reading from and for writing data into electronic tags which may be associated with objects which are moving with respect to an interrogator, or may be located in fixed positions in the path of a moving interrogator. The interrogator, which is stationary if the tag is moving, sends a continuous RF signal to the remote tag. The tag backscatter-modulates the received RF signal with data temporarily or permanently stored in the tag, including, for example, data associated with the object to which the tag is attached, for example, its identity or contents. The system of this invention uses a very efficient encoding technique for the data which is backscatter-modulated by the tag and received by the interrogator. The backscatter-modulated signals are made up of signals of first and second frequencies f.sub.1 and 2f.sub.1, respectively, where the second frequency 2f.sub.1 is twice the first frequency f.sub.1, and where one of the two binary bits ONE and ZERO is represented by one-half period of a signal of the first frequency followed by one period of the second frequency, and the other of the two binary bits is represented by one period of a signal of the second frequency followed by one-half period of a signal of the first frequency. The signals also contain FRAME MARKERS made up of five periods of frequency 2f.sub.1 followed by one-half period of frequency f.sub.1. [A3560]

"Method of Kalman filtering for estimating the position and velocity of a tracked object"

A method of Kalman filtering for estimating the position and velocity of a racked object is provided. A Kalman filter is initialized with at least position and velocity error states in an inertial computational frame. Sensor measurements are used to develop a measured line-of-sight vector to the object. Matrix transformations are used to analytically rotate the sensor measurements into a measurement frame. The measurement frame is defined as having one axis pointing towards the estimated relative position of the object. The use of the measurement frame allows the method to be adaptable to any line-of-sight/computational frame geometry. Since statistical correlation of the measurements is not present in the measurement frame, the number of computations at each filter update is reduced. [A3561]

"Moving target indication unit"

Moving target indication unit provided with a doppler filter bank (1) with n output channels A.sub.i (i=0, 1, 2, . . ., n-1) , several threshold circuits (24.i) connected to the output channels, a detection and registration unit (7, 14, 18, 23) provided with means (7, 14, 18) for the determination and registration, per azimuth cell, of a parameter for the amount of clutter in an azimuth cell. The said means are further suitable for determining, based on the output signals of the filter bank (1) , k (k.gtoreq.2) parameters per azimuth cell and processing per azimuth cell the combination of k parameters to obtain n threshold values, used to set the n threshold circuits. [A3562]

"Target range detector with moving target indication"

An apparatus for determining a target position within a selected range segment includes a range gate generator which provides a range gate signal that enables a detector for a time interval corresponding to the range segment and a signal generator, responsive to the range gate signal, which provides a signal having an amplitude which varies with time. The output signal of the signal generator is sampled by a sample and hold circuit. A control signal generator enabled during the range gate interval couples a switching signal to the sample and hold circuit which, upon the reception of a target reflected signal, causes the sample and hold circuit to switch from the sampling mode to the hold mode. The signal amplitude in the hold mode is a representation of the target position within the range gate. Range rate is determined from a knowledge of the elapsed time between range gates corresponding to the same range segment and the difference in positions within the range gates established by the sample and hold circuit when switched to the hold mode upon receptions of the target reflected signals. [A3563]

"Weather radar system with improved display characteristics"

A weather radar system having improved display characteristics for rotation and translation of weather data where the rotations and translations are accomplished by converting data in a dedicated polar coordinate memory to display memories. The translation and rotation of the data between data updates is accomplished by referring to the data stored in the dedicated polar coordinate memory and thereby generating new rotated or translated data without requiring a manipulation plate of the data in the display memories. [A3564]

"FMCW radar range tracker and method"

A range tracking technique for producing a ground return signal in an FMCW radar system. The radar system produces an IF signal having frequencies within a range extent band, the IF signal including a ground return component having frequencies in a narrower ground return band. The range tracker includes a tracking system, a search system, and a controller. The tracking system receives the IF signal and a track control signal, and bandpass filters the IF signal to produce the ground return signal. The search system also receives the IF signal, together with a search control signal from the controller. The search system includes a second bandpass filter for bandpass filtering the IF signal to produce a band power signal. The controller receives and stores samples of the band power signal, and identifies the ground return component. The location of the ground return is used to adjust the track control signal, to keep the first passband centered on the ground return. [A3565]

"Automatic range adjustable weather radar system"

The range of a weather radar systems (60) is automatically extended by incrementally increasing the pulse width (17) from transmitter (12) in response to detecion of excessive path attenuation determined by a comparator (32) comparing the level of actual attenuated return pulses (19) from a range correction accumulator (34) with a path attenuation compensation level selected by a computer (26) . The bandwidth of the receiver (14) , the value in an initial sensitivity time control value circuit (54) , the value in a path attenuation compensation correction value circuit (62) and the path attenuation correction alert threshold are also selectively varied automatically in accordance with the incremental changes in the width of transmitted pulses (17) . [A3566]

"Vehicular anticollision radar system for driving in the fog"

The space ahead of a moving vehicle is irradiated in sectors (A-G) by a plurality of CW solid state radar devices mounted as an array across the front of the vehicle, such that adjacent lobes of each beam may overlap. The radar signal comprises a CW beam modulated intermittently by a slightly offset frequency to produce `pulses` which when reflected from obstacles within respective sectors (A-G) are detected by mixer diodes in one, or two adjacent radar devices after a time delay which, measured, yields a distance to the obstacle. Obstacles so detected may be displayed in two dimensions within their respective sector (A-G) on a display projected onto the windscreen. [A3567]

"Method for extracting motion errors of a platform carrying a coherent imaging radar system from the raw radar data and device for executing the method"

In a method for extracting motion errors of a platform carrying a coherent imaging radar system from raw radar data, azimuth spectra continuously following each other in time are formed over a set period of time for the imaging of terrains with mainly homogeneous ground reflectivities. An estimate of the ground reflectivity part is performed with a Kalman filter and with the aid of the azimuth spectra represented and system parameters entered. Then the antenna pattern part is obtained by dividing the azimuth spectrum by the estimated ground reflectivity part. By frequency filtering a separation of the drift angle .phi. (t) from the velocity V.sub.b (t) in the LOS- direction of the antenna is subsequently performed and then the velocity obtained is subjected to normalization after having been integrated, from which results the displacement in the line of sight direction of the antenna. [A3568]

"Golf information system"

A golf information system which automatically provides golfers with reference position and distance information from a number of points on a particular golf course hole. In one embodiment, radio frequency identification tags would be positioned along a golf cart path, for example, buried underneath the path, and a reading system carried by the golf cart would output an interrogation signal which would activate the tags causing the tags to output a coded signal which would be received by the reading unit, which would retrieve information about that location from memory and output it to the golfer. The system can further be used to display advertising messages and to provide golf course management features such as monitoring cart usage and speed of play. [A3569]

"Doppler determination system for MTI radars"

A doppler determination system uses an amplitude comparison of odd and even MTI functions derived from the same signal returns in an MTI radar system to determine the doppler frequency of a target return. The system determines the ratio of the amplitudes of the return of a single canceller circuit with a delay of 2/PRF and the amplitude of the return of a double canceller with two delays of 1/PRF. The ratio is then employed to estimate the doppler frequency of the return. The respective amplitudes of the two MTI circuits are also processed in a 3-dimensional radar application to provide estimates of the target radar cross-section and elevation angle, and with PRF switching to determine the target unambiguous range rate. [A3570]

"Method and apparatus for ground radar information display system"

Disclosed herein is a method and apparatus for a ground radar and information display system for commercial and general aviation. The method includes processing raw data from the presently existing ATCRBS system, duplicating the raw data and sending it to an auxiliary computer, filtering out non-positional messages of the raw data, encoding the raw data into a data block transmitting the data block to a display facility, where it is decoded and displayed. The apparatus of the invention includes and auxiliary ground computer and a smaller on-board computer for processing the data block. [A3571]

"Driver alerting device"

A driver alerting device includes a transceiver adapted for mounting at the rearward end of a vehicle for directing its wave output rearwardly of the vehicle. Return wave signals for many objects within the transceiver range are picked up and supplied to the transceiver by an antenna. Any resultant doppler shift signal is amplified for driving an audio alarm adapted for placement within the passenger compartment of the vehicle. The circuit is adapted for electrical connection to the back-up light circuit of the vehicle for activation only when the vehicle transmission is engaged in reverse gear. [A3572]

"Method and apparatus for doppler velocity de-aliasing"

A method and apparatus for real time de-aliasing of the Doppler velocity data in a weather radar system by using a Process Radials routine which processes every valid range gate along a radar dwell by determining if each range gate is within the Nyquist velocity of either the average of four preceding range gates or data from a Windfield Model. To further enhance the de-aliasing process a Process Dual Scans routine is used prior to the Process Radial routine to de-alias velocity data by comparing velocity data from two scans of different pulse repetition frequencies. Subsequent to the Process Radials routine, a Minimize Azimuthal Shear routine checks velocity discontinuities from azimuth to azimuth. The de-aliased data is transferred to an Update Windfield Model routine for quality checks of the de-aliased velocity data and updating of the Windfield Model. This complete method of de-aliasing the velocity data is performed during the real time operation of the radar system. [A3573]

"Measuring system"

The invention relates to a measuring system having a measuring array comprising a transmission and reception section and an electronic evaluation unit. In accordance with the invention, the distance between a first point and a second point is determined by moving the measuring array between the two points using the Doppler effect, with an intermediate frequency being formed in the transmission and reception section from the transmission frequency of the signal emitted by the transmission section and from the reception frequency of the signal reflected off a fixed object and picked up in the reception section, and the number of periods of intermediate frequency generated during the measuring operation being counted in the electronic evaluation unit to derive the distance. [A3574]

"Vehicle forward sensor antenna steering system"

A transmitted and received beam of a forward looking sensor of a source vehicle is steered as the source vehicle travels through a curvilinear path so that the steering angle is controlled to prevent the loss of detection of a target vehicle resulting from the effective lateral shaft of the beam relative to the path as the beam is steered into the curvilinear path. The beam is steered at an angle that limits the effective lateral shift of the beam relative to the curvilinear path such that a predetermined minimum target vehicle detection criteria is achieved. [A3575]

"Marine object detector"

A system is disclosed for detecting and locating the occurrence of anomal to radio frequency electromagnetic transmission in conductive liquids. Applications are described for use in swimmer detection and for process monitoring. [A3576]

"Dual satellite navigation system"

A method and system for determining the position of an object using a fixed station and a plurality of earth orbit satellites whose positions are known. Separate periodic signals are transmitted from the fixed station via first and second satellites to the object whose postion is to be determined. The phase offset in periodic characteristics of the periodic signals as received from the first and second satellites is measured at the object. The phase offset corresponds to a relative time difference in propagation of the signals traveling two different paths to the object. The object transmits via the first satellite a return signal indicative of the measured relative time difference. This return signal is activated some time in the future according to the object local time, which is slaved to receipt of the periodic signal sent through the first satellite. This future time is the start of the particular time period as decided by the fixed station's schedule. At the fixed station, an instantaneous round trip delay, determined by the time offset of the current transmission clock time relative to the receive clock time of reception of the return signal, along with the measured relative time difference sent back on the return signal, is used to calculate the distances between the first and second satellites to the object. From these distances the position of the object is calculated. [A3577]

"Top mounted buoy signaling device"

A top mounted buoy signaling device for marine navigation which is selectively activated in response to a coded address signal. The buoy signaling device includes a buoy having a top mounted receiver assembly which is activated by a transmitter assembly. The receiver circuit, transmitter circuit and antennas therefor are printed on circuit boards. The transmitter circuit includes an encoder chip which is preset to provide a coded address. The coded address is utilized to modulate a carrier signal to provide a coded address signal to activate the receiver circuit. The receiver circuit includes a decoder chip which is preset to the coded address of the corresponding transmitter. A lamp driver subcircuit is enabled in response to the coded address signal. The lamp driver subcircuit includes a master timer subcircuit which maintains the driver subcircuit in an operative condition for a predetermined period of time and a flash timer subcircuit which periodically energizes a lamp to provide a flashed output. The receiver circuit may also include a power timer subcircuit to periodically energize the receiver circuit for short-interval operation and a sweep circuit to allow the receiver circuit to receive coded address signals within a predetermined bandwidth. [A3578]

"Aperture synthesized radiometer using digital beamforming techniques"

A digital aperture synthesized radiometer for synthesizing the imaging an image scene. A plurality of antenna arrays receive radiation emitted or reflected from an scene, and an analog to digital coverter converts received radiation into digitized signals. A digital beamformer synthesizes the digitized signals to provide an image corresponding to the scene. The digital beamformer comprises individual digital beamformers which generate a set of fanbeam signals for each array. The beamformers provide for cross track imaging of the scene. A digital interferometer correlates corresponding pairs of fanbeam signals from the two sets of fanbeam signals to produce a chirp signal for each pair. A matched filter processes the chirp signals to transform each chirp signal into a corresponding image point of the scene. This provides for along track imaging of the scene. The beamformers include an amplitude weighting and data turning circuit to reduce fanbeam signal sidelobe levels and eliminate alternate mainlobes from the digitized radiation signals to reduce mainlobe widening. A fast Fourier transform circuit in the beamformers generally comprises a decimation-in-time algorithm implemented by means of a plurality of parallel and cascaded butterfly computation circuits. Image processing methods for achieving digital radiometry are also disclosed. [A3579]

"Adaptive cruise system"

An adaptive cruise system for a vehicle maintains a desired selected operator-set speed in the absence of a detected preceding target vehicle and adjusts the vehicle speed when a target vehicle is detected to maintain a following distance that is set by the vehicle operator. An alert distance is computed that is a predetermined function of a distance based on driver reaction time. To provide for the driver selectable trailing distance, the driver reaction term of the alert distance is adjusted by the vehicle operator to achieve a desired distance to the target vehicle. [A3580]

"Adaptive multifrequency signal combining system"

Apparatus and methods for combining incoherent signals having different carrier frequencies but a common modulation to obtain a coherent summation of the modulations of such signals are described. The apparatus comprises adaptive means of changing the carrier frequencies and corresponding phases of various signals to a common carrier frequency and a common phase, thus enabling the coherent summation of the common modulation and enhancing, thereby, the level of received information content. When the incoherent signals are transponder-signals, radiated from an object or platform in response to a modulated interrogating signal, and are obtained by different frequency offsets from the interrogating signal carrier frequency, the particular offset frequencies being unique to that object or platform, the ability combining of modulations coherently provides a means of unique identification of the object or platform. [A3581]

"Electronically scanning vehicle radar sensor"

A plurality of transmitting (14, 16, 18, 20) and receiving antenna elements (22, 24, 26, 28) are formed on a support member (12) which may be mounted on a corner of a vehicle for scanning a pattern including areas on opposite sides of the vehicle corner. In an automotive application, the pattern may include a rear area, and a blind spot on the side of the vehicle adjacent to the rear area. A transmitter (50) is connected to the transmitting antenna elements (14, 16, 18, 20) by a passive phased array (30) such as a planar microstrip Butler matrix, and an electronic switch (52) which sequentially connects the transmitter (50) to inputs of the transmitting array (30) . A receiver (62) is similarly connected to the receiving antenna elements (22, 24, 26, 28) by a planar microstrip passive phased array (40) , and an electronic switch (64) which sequentially connects the receiver (62) to outputs of the receiving array (40) . The support member (12) may be formed into a non-planar shape, or be flexible enough to be bent into a non-planar shape, to conform to a non-planar surface of the vehicle on which the sensor is to be mounted. [A3582]

"Method and apparatus for sensor fusion"

Methods and apparatus for fusion of data from optical and radar sensors by error minimization procedure. The method has been applied to the problem of shape reconstruction of an unknown surface at a distance. The method involves deriving an incomplete surface model from an optical sensor. The unknown characteristics of the surface are represented by some parameter. The correct value of the parameter is computed by iteratively generating theoretical predictions of the Radar cross-sections (RCS) of the surface, comparing the predicted and the observed values for the RCS, and improving the surface model from results of the comparison. Theoretical RCS may be computed from the surface model in several ways. One RCS prediction technique is the method of moments. The method of moments can be applied to an unknown surface only if some shape information is available from an independent source. The optical image provides the independent information. [A3583]

"Stolen vehicle recovery system"

A stolen vehicle recovery system (20) in which a vehicle transceiver (30) is disposed on each vehicle (28) for cyclically transmitting a pulsed signal which is modulated by a data stream comprising a verification code, a unique identity code associated with the vehicle (28) , and a code which corresponds to whether the detected vehicle (28) is moving or stationary. The vehicle transceiver (30) is automatically activated if a proper authorization signal is not provided to the transceiver (30) by a verification unit. A scanning receiver (42) decodes the pulsed signal and provides the information to a control processor (40) which, in turn, sets remote direction finding receivers (44, 46, 48) , set up in a triangulation antenna array, to the appropriate channel. The D.F. receivers (44, 46, 48) measure the bearing, signal strength and time variation, as well as the vehicle identity code, and pass it back to the control processor (40) which, after verification of the identity code, passes this positional information on to a mapping and display computer (50) at the central station (22) which, thereafter, provides a digitized street or terrain map display with the vehicle position and identity code being dynamically displayed thereon. The map may be zoomed through a hierarchical geographical display. The system (20) may be used with multiple vehicles in the same detection area with the channel being divided into a plurality of sub-channels and a composite map display dynamically showing all stolen vehicles (28) in the detection area. Mobile tracking (110, 112, 114, 116, 118, 120, 122) may al be used. In addition, the transceiver (30) can be remotely activated or deactivated, and overlapping detection areas can be provided to cover a larger area. When the transceiver (30) is initially activated, the verification code is set to an unverified state and is changed to a verified state, after confirmation of stolen status, by a command sent from the command transmitter (52) . [A3584]

"Mode 4 reply decoder"

A reply decoder (30) for declaring mode 4 replies when used with a KIR cryptograph computer (25) is described including timing logic (114) , memory (112) for storing mode 4 replies and logic circuitry for analyzing replies stored in the memory (112) . The invention further provides logic circuitry for detecting railing (117) i.e., successive replies, for detecting garbled or overlapping replies (123) , for providing a floating density value window (114, 120) for summing the replies in nonselected reply positions and for target start/stop determination (215) based on selected criteria. The invention overcomes the problem of declaring excessive mode 4 replies which over burden the subsequent reply processing in a reply processor (50) . [A3585]

"Battlefield IFF method and system for its application"

An IFF system interrogating station comprises an IFF interrogator which has its transmission antenna joined to the infra-red camera of a field observation device. Each friendly vehicle is fitted with an IFF receiver antenna and an infra-red laser transmitter transmitting a laser pulse at each IFF interrogation. [A3586]

"Single station radar ocean surface current mapper"

A method and system for mapping ocean currents with a single radar. The radar is a pulsed monostatic radar operating in the HF/VHF range using a single transmitting antenna with a wide beam width. There is a linear array of antennas, each with its own receiver/digitizer system to sample the complex signal. The summing and phasing of the signals is done in software. The correlation functions are calculated using two successive complex Fourier transforms. The current vectors are measured as a function of range and angle from the radar site, thereby generating the current map. [A3587]

"Polystatic correlating radar"

The polystatic correlating radar includes a plurality of radar receivers which receive a signal reflected from an object from one or more radar signal transmitters. Signals received from the plurality of receivers are cross correlated to provide high resolution of the angular location, range, and radial velocity measurements, as well as tangential velocity measurements for close targets. [A3588]

"Computed-interferometry radar system with coherent integration"

In a radio-frequency radar system, a radar antenna (12) irradiates a region to be monitored, and antenna elements (14a-p) arrayed irregularly about a mobile platform (10) receive the resultant echo signal, which mixers (18 and 21) translate in frequency, coherently with the transmitted signal, to a lower frequency, at which a sample-and-hold circuit (24) can sample it. A beam-forming operation is performed on the sample signals by employing coefficients that have been computed from calibration readings taken by the elements mounted on the platform. The beam signals resulting from numerous successive transmitted pulses are then integrated coherently to produce an output. [A3589]

"Traffic monitoring device"

A traffic monitoring device mounted in a moving monitoring vehicle comprises a radar device for measuring the relative speed of a vehicle to be detected with respect to the speed of the monitoring vehicle. A speedometer measures the speed of the monitoring vehicle. By means of a releasing mechanism automatically triggered at adjustable limit speeds, a camera is released and the vehicle to be detected is photographed. The relative speed of the vehicle to be detected and the speed of the monitoring device are added in summing means. The sum then corresponds to the absolute speed of the vehicle to be detected. The camera is not released dependent on the relative speed but on the absolute speed of the vehicle to be detected. Thereby, all vehicles exceeding an allowed speed are detected without taking an unnecessary number of pictures. [A3590]

"Method and apparatus for compiling and evaluating local traffic data"

A method for compiling and evaluating local traffic data based on a real time evaluation of Doppler echoes on a digital basis, wherein initially the frequency spectrum of the Doppler echo is formed, then the frequency of the maximum amplitude in this spectrum is identified, and the speed of the vehicle is determined from this frequency. The length of the vehicle can also be determined from the speed of the vehicle and from the Doppler echo signal duration. An apparatus for implementing the method includes a millimeter wavelength radar sensor, a transmission unit, and an evaluation unit operating with digital signal processing. [A3591]

"Signal transmission system and method"

A data transmission system includes a data carrier which has a memory for storing therein data including an identification code and which is attached to an object and a main apparatus having a microwave oscillator so as to conduct communications with the data carrier by use of a microwave, thereby writing data in or reading data from the memory of the data carrier. The main apparatus transmits a microwave modulated by a command or data and thereafter transmits a nonmodulated carrier for a predetermined period of time. On receiving a command, the data carrier executes a read/write operation on the memory and then generates a response. The data carrier receives the nonmodulated carrier sent from the main apparatus so as to conduct a modulation of quadrature phase-shift keying thereon by use of response data, thereby reflectively transmitting the modulated carrier with a plane of polarization shifted from a plane of polarization of the received wave by 90.degree.. [A3592]

"Servo control with self calibrating preset"

A frequency input for receiving a frequency signal and digital storing for storing the received frequency signal. A controller has a first and second input and an output. The first input is connected to the digital storage for providing a reference signal and the output provides a frequency control signal. The second input is connected to circuitry for changing the operation mode of the controller to either an amplifier or an integratory. As an amplifier, a digitally set offset and gain is applied to the amplifier for providing an output generating approximately the frequency of a prior signal. A switch connects the frequency output to the second input when operating in the integrating mode to control the output for generating a desired frequency. [A3593]

"Non-contact control"

Control means is provided for non-contact equipment such as a solenoid valve (2) controlling water flow from a faucet (6) . The control means comprises a motion detector based on strip antennae (14, 15) which transmit and receive microwave frequency electromagnetic radiation into and out of a preselected detection volume (18) . A receiving circuit (16) of the control means may be adjusted so as to vary the detection volume (18) , and is provided with a timing means (24) which insure sustained operation of the equipment even when the motion detected in the detection volume (18) is sporadic. The means finds particular application to faucets such as those used to supply water to sinks or basins. [A3594]

"Method and apparatus for measuring a vehicle's own speed by the Doppler radar principle"

A method for measuring a vehicle's own speed by the Doppler radar principle, in accordance with which microwaves of a transmission frequency are sent out by the vehicle, a part thereof being reflected back and mixed with the microwave signal at transmission frequency. In this way Doppler signals are produced which, after pulse formation, are evaluated as Doppler pulse signals by a frequency measurement in the time range plus direction-of-travel evaluation, so as to form digital Doppler signal values. for the determination of a mean Doppler period in each case, a median M (n-3) is continuously determined from a predetermined number of the last generated digital Doppler signal values of the sequence M (n-1) , M (n-2) , M (n-3) , M (n-4) , M (n-5) . [A3595]

"Method and system for real aperture radar ground mapping"

A system for real beam radar ground mapping using a monopulse antennae to determine off-boresight angle of target returns. Off-boresight angle is converted to azimuth bins. After processing, return energy for each contiguous azimuth bin of an illuminated area is dumped during a respective "look" of the antenna. [A3596]

"Method and apparatus for processing sampled data signals by utilizing preconvolved quantized vectors"

An electronic system for processing sampled data input signals includes an electronic memory which stores a set of preprocessed vectors V.sub.1 f (m, . . .) thru V.sub.N *f (m, . . .) where f (m, . . .) is a sampled data function, having any number of dimensions m, ... * is a convolution operator, and V.sub.1 thru V.sub.N are a finite set of N unprocessed vectors each of which represents an anticipated group of input signal samples. After these preprocessed vectors are stored, input signals are processed in real time by (a) a circuit which samples the input signal, (b) a circuit which compresses the sequence of samples that is taken into a smaller sequence of index signals that correspond to the indexes 1 thru N of the unprocessed vectors, (c) a circuit which receives the smaller sequence of index signals and reads from the memory those preprocessed vectors whose indexes match the received index signals, and (d) a circuit which adds together the read preprocessed vectors while maintaining a predetermined offset between them as they are added. [A3597]

"Brackish-water wire detector"

A detector of electrical wires which aer partially submerged in water and rtially extend out thereof having a means for broadcasting electromagnetic energy to the underwater portion thereof and means for receiving electromagnetic energy from the out of the water portion thereof. [A3598]

"Enhanced pulse time-of-arrival detector"

A detector for detecting a communication pulse in the presence of noise is disclosed having a transmitter for transmitting a communication pulse of carrier frequency having a main pulse portion and a pre-pulse portion, the pre-pulse portion being of substantially opposite phase to the main pulse portion, a receiver for receiving the communication pulse, a correlation signal circuit connected to the receiver for providing a correlation signal, the correlation signal having first and second slopes in response to the communication pulse, the second slope being steeper than the first slope, and a comparator connected to the correlation signal circuit for providing a pulse detection output signal when the correlation signal reaches a predetermined threshold, the threshold being set at level to detect the correlation signal at a point on the second slope. [A3599]

"Electronic proximity fuse responsive to two signals"

An electronic proximity fuse of the FM radar type having a detonating circuit with two inputs. One input is derived from a signal representing the amount by which the frequency of the received signal differs from the frequency of the transmitted signal at the instant of reception averaged over the frequency-modulation period. The second input is derived from a signal proportional to the amount of the frequency fluctuations of the frequency deviation about the averaged amount. [A3600]

"Ground probing radar method and apparatus"

A wheeled support assembly 10 is manually pushed over the ground and has a motor 22 rotating an antenna assembly 60 about a vertical axis 24. Encoders 28 on the antenna shaft 20 and on a wheel axle encode antenna angular position and position over the ground. Transmitted pulses and received data pass through a rotary microwave connector 26. for example, 400 sets of pulses are emitted at equal angular intervals in each revolution of the antenna assembly. The interval between pulses is e.g. 12 microseconds, with 256 pulses per set. Noise reduction is achieved by processing the received data accordingly. In a modification the rotary connector 26 is single channel with some electronic stages mounted on the rotating antenna assembly. Power is coupled to them via the microwave cable. An umbilical connects the assembly 10 to a support facility including a computer. Alternatively, battery power is used with data transferred radiatively. [A3601]

"Collision avoidance system for automatically controlled vehicles moving at short headways"

Safe separation distances between automatically controlled vehicles moving at short headways on a guideway are maintained through the cooperative action of a block control system and reflectometer (radar) and transponder (beacon) intervehicle distance measuring equipment installed in vehicles. A reflectometer determines distance to a leading vehicle through measurement of the delay between a transmitted signal and a received signal relayed by a transponder in the leading vehicle. A transmission line acts as the medium of transmission. Problems associated with non-transponder-equipped reflectometers are obviated. In the event of transponder malfunction, the block control system maintains backup safety regardless of transponder activity in other vehicles. Exessively short block lengths generally required for short-headway maintenance by block control systems are not required. Merge protection is effected through the cooperative action of the block control system and stationary reflectometers, installed at the wayside, which measure distances to merging vehicles through interaction with transponders located in the vehicles. [A3602]

"Single-scan editor of bird echoes"

A single-scan editor of bird echoes uses range rate to aid in identifying bird echoes. The range rate is preferably calculated from change in phase between one interpulse period to the next interpulse period and both unfiltered and MTI filtered signals are used for the calculation of change in phase. The unfiltered phase difference is used if the logarithm of the total power of the phase difference exceeds a predetermined threshold during at least one of the interpulse periods and if not, the MTI filtered phase difference is used if the total power of the MTI filtered signal exceeds a corresponding predetermined threshold. If neither threshold exceeds the corresponding threshold, no calculation is made. Due to the relationship between phase difference and range rate, several possible range rates correspond to most phase differences. Therefore, an occurrence of each of the possible range rates is counted over the course of a cycle. The cycle covered is shifted one interpulse period at a time and the largest number of occurrences of sets of range rates for all such cycles are stored during the detection of a target. These largest number of occurrences are totaled to produce a total count which is used to produce a ratio of the largest number of occurrence of each of the sets of range rates to the total count. These ratios are individually compared with a threshold. If the threshold is exceeded an indication is produced that the target has a range rate within the set of range rates corresponding to bird speeds. In this case, the radar target data is edited to prevent display. [A3603]

"Non-contact vital signs monitor"

An apparatus for measuring simultaneous physiological parameters such as heart rate and respiration without physically connecting electrodes or other sensors to the body. A beam of frequency modulated continuous wave radio frequency energy is directed towards the body of a subject. The reflected signal contains phase information representing the movement of the surface of the body, from which respiration and heartbeat information can be obtained. The reflected phase modulated energy is received and demodulated by the apparatus using synchronous quadrature detection. The quadrature signals so obtained are then signal processed to obtain the heartbeat and respiratory information of interest. [A3604]

"Inductive input/output coupling for a surface acoustic wave device"

A transponder for use in an interrogator/transponder system includes a piezoelectric substrate for coupling electrical energy into and/or out of a surface acoustic wave (SAW) device, a first inductive loop inductively coupled to a conductive loop on the substrate, a second inductive loop inductively coupled to the first inductive loop for transmitting and/or receiving electrical signals to and/or from the SAW device. The first inductive loop forms an intermediate inductive coupling path between the second inductive loop of the transmitter/receiver and the conductive loop on the substrate. [A3605]

"Apparatus for detecting materials buried under the ground"

If electromagnetic waves are emitted from a plurality of points on the ground surface above a material (TG) buried under the ground, an echo image (EP) formed from the data of propagation times of reflected waves at each of the points describes a hyperbola as a result of expansion of the transmitted electromagnetic waves. An operation is carried out to overlap on the echo image (EP) a false echo image (DM) which lies on the same coordinate system and which consists of a similar hyperbolic image. If the two echo images (DM, EP) are overlapped upon each other as the result, the vertex position and the expansion of the opening of the echo image (EP) can be determined from the data of the false echo image (DM) . The propagation velocity of electromagnetic waves under the ground is then calculated from the data that represents the vertex position and the expansion of the opening. After the propagation velocity of the electromagnetic waves are calculated, the position of the material (TG) under the ground is then calculated in relation to the data of propagation time at any position. [A3606]

"ATCRBS/SIF/TCAS reply decoder"

A decoder for separating pulse code modulated messages of the type used in ATCRBS where the messages are identified by two framing pulses separated by 20.3 us. and contain information pulses between the framing pulses separated from the framing pulses and from one another by 1.45 us. The decoder receives an input stream of pulses of uniform width from a Leading Edge Detector which has created the stream from video pulses received from the transmitter of another station. The decoder input pulse stream may contain interleaved pulses from more than one message. The decoder includes an input shift register, an analysis shift register, a plurality of buffer storage devices and additional registers to which selected pulses are fed from the input register for use in determining whether a received message is clear of interfering pulses or whether the message is potentially or actually garbled. The input pulse stream is passed through the input register into the analysis register where the framing pulses enable the loading into buffer storage of the information pulses associated with the framing pulses. Pulses in the analysis register at the time a message is loaded into buffer storage and not included in the message loaded may be included in a message later loaded in a second retained in buffer storage with messages currently being loaded into messages. [A3607]

"Signal-transmission type production supervising system including IC card and wireless type interface unit"

In a production supervising system of a work, a wireless type production supervising data processing apparatus is mounted on the work. The wireless type production supervising data processing apparatus includes a wireless type interface unit, and an IC card. The IC card includes CPU, EEPROM for storing the production supervising data, ROM for storing the program data, and RAM capable of storing other data than the production supervising data. The wireless type interface unit includes antennas, a receiver, a transmitter, a demodulator connected to the receiver, and a modulator connected to the transmitter. During the production of the work, the production supervising data previously stored in EEPROM are read from the IC card and processed in the interface unit and thereafter transmitted from the interface unit toward the external data controlling apparatus. [A3608]

"Radar receiving device and radar including such a device"

Radar apparatus for processing a received signal having a carrier frequency f.sub.0 includes means for directing the received signal in parallel into first and second channels. A first filter in the first channel bandpass filters the received signal and is centered at a frequency f.sub.1 equal to f.sub.0 +.DELTA..sub.1 f. The first filter provides an output signal having a central frequency f.sub.0 +.DELTA..sub.1 f/2. A second filter coupled in the second channel bandpass filters the received signal and is centered at f.sub.2 =f.sub.0 +.DELTA..sub.2 f. The second filter thus provides an output signal having a central frequency f.sub.0 +.DELTA..sub.2 f/2. A first mixer in the first channel mixes the first filter output with a signal f.sub.1 =f.sub.0 +.DELTA..sub.1 f/2 to extract the carrier frequency of the first channel. Likewise, a second mixer in the second channel mixes the second filter output signal with a signal f.sub.2 =f.sub.0 +.DELTA..sub.2 f/2 to also extract the carrier frequency in the second channel. The ouputs of both mixers are then passed to a processing and exploitation device to manipulate the signals to arrive at the appropriate range and/or velocity information. [A3609]

"Geophysical radar apparatus and method"

A ground probing radar is described for detecting radar reflections from underground objects. The radar is of the pulse compression type. A transmitter generates a biph Government Support The U.S. Government has rights to this invention pursuant to Contract No. 536115 (DACA 89-81-K-0004) awarded by U.S. the Army Cold Regions Research and Engineering Laboratory. [A3610]

"Method of detecting oil spills at sea using a shipborne navigational radar"

A method is provided wherein standard shipborne navigational radar is used for the purpose of detecting oil-spills on the sea. A homogenous sea-return image is obtained by selectively reducing the sea-clutter, rain, and haze filters of the radar while selectively increasing the gain of the radar. Because oil-spills on the surface of the water minimize the backscatter of radar waves, the location of an oil-spill may be determined by identifying characteristic distortions in the form of zones of diminished sea-return in the homogenous sea-return image. A moving oil spill may be tracked with repeated observations. [A3611]

"Automatic parking device for automobile"

A device to be mounted on a car for assisting a driver to make a parallel parking or a perpendicular parking, comprises displacement-sensing devices to measure specific distance that the car moves, obstacle-sensing devices for sensing the position of obstacles around a car, and a microcomputer that can, in accordance with the driver's instructions and the data received from aforesaid displacement-sensing devices and obstacle-sensing devices, generate various signals to tell the driver to drive the car forwards, to stop the car, to turn the car left or right, or to back the car so as to park the car along a specific path, further more, the microcomputer may generate an output signal to control the steering mechanism the transmission, the accelerator, and the brake system for backing the car into a parking space automatically. [A3612]

"Apparatus and method for transform space scanning imaging"

An image of a target (11) is produced by illumination of the target (11) with overlapping fields (18, 20) of wave energy, such as coherent light, producing an interference pattern (22) moving across the target. At least one pair (12) of sources (14, 16) wave energy provide the moving interference pattern (22) . The scattered illumination reflected from the target is detected by a non-imaging receiver (24) , a two dimensional spatial frequency map is recorded (30, 62) , based upon the amplitude, frequency and phase of the illumination received, and a two dimensional image of the target is formed (32, 72) by applying a Fourier transform to the two dimensional frequency map. [A3613]

"Collision predicting and avoidance device for moving vehicles"

Apparatus for avoiding collision between a vehicle and an object that moves in a trajectory relative to the vehicle. The apparatus includes at least one microwave pulsed transmitter and receiver for transmitting a scanning beam of pulsed energy which scans a sector of space, at least forward of the vehicle, a check for producing timing pulses, a ranging device connected to the clock and the receiver for measuring the time difference between the transmitted pulses and any echoes received by the receiver. The antenna is pivotally coupled to the vehicle and a scanning motor serves to set the antenna in a scanning motion. A direction device is coupled to the scanning antenna for sensing the direction of the antenna. A computer is connected to ranging device, the clock, the direction device and computes continuously the last three coordinated for vector to the object, and is connected to an anunciator which can speak and/or display a message to the vehicle operator. [A3614]

"Navigation, communication, and surveillance system based on DME"

The distance measuring Equipment (DME) is a well-approved means for short nge navigation in international civil aviation. It utilizes the inherent capacity of the system in most applications to a relatively small degree. Therefore, additional functions can be integrated into the system such as data links, ground derived slant range measurement equipment and direction finders (growth potential) . Thus, the DME can be extended to an Integrated Navigation, Communication, and Surveillance System. This system may be superior by technical, as well as by economical and operational reasons, to conventional solutions, which use separate systems for the different functions. The integrated system can be composed in different ways using different sets of the DME growth elements. A promising set is described and applied to a scenario of helicopter operations with oil rigs. [A3615]

"Secondary radar transponder"

A secondary radar transponder on a mobile target has an antenna arrangement which can receive interrogation signals from all directions and radiate reply signals. The antenna arrangement includes several individual antennas, each of which, with its primary lobe, covers a specific sector of the entire 360.degree. range and is connected to a receiver, so that through receiving level comparison, that particular sector from which the interrogation signal incides can be ascertained. The reply signal is then radiated only by the individual antenna covering that particular sector. The transponder is particularly suited for identification friend-foe (IFF) purposes. [A3616]

"Process for range measurement with a pulse radar of high pulse repetition frequency"

With a frequency-agile pulsed doppler radar with high pulse repetition frequency (HPRF) in the unambiguous velocity region, in order to measure the range of a target the complex time signal derived from the echo signals of a coherent processing interval (CPI) is transformed into the frequency domain, the transformed spectrum is multiplied by a bandpass function with a mean frequency coinciding with the doppler frequency of the target, and the product is transformed back into a time signal. The real envelope of this re-transformed time signal displays a definite leading edge and a steady state region, from which the echo travel time can be estimated. Particular advantages may be derived for the pulsed doppler radar set from a plurality of frequency agile transmitter/receivers operated at the same time at different frequencies, and whose frequency switching times are time-staggered. [A3617]

"Radar system for headway control of a vehicle"

A radar system for monitoring the headway control distance between a vehicle equipped with a radar system of the present invention and a fixed or moving object of immediate concern in front thereof. The system employs an antenna positioned in front of the vehicle, transmitter and receiver circuits and signal processing circuits. A transmitted signal from the transmitter circuit when reflected back from an object of immediate concern is received by the receiver circuit and fed into conditioning circuits which separate the received signal into controlling signals that include the range or distance (R) to a detected object of concern, the closing rate (CR) to that object and the vehicle speed of movement (VS) . Driving condition modifiers (.+-.DM) such as traffic conditions and weather conditions, the level of which are manually chosen by the operator of the vehicle are combined with the received signals to constantly provide changing signals to dynamically determine a hazard level (HZL) which is compared to a preset reference level to 2 according to the mathematical formula or algorithm HZL=R+CR+VS.+-.DM. The DMs, which combined collectively with define or replicate the operator's perceived safe drive conditions. [A3618]

"Intensity area correlation addition to terrain radiometric area correlation"

A system which combines intensity area correlation is disclosed for use with terrain height radar and infrared emissivity systems to give a simultaneous three-mode map matching navigation system. The infrared system senses passive terrain emissions while the height finding radar measures the time between transmission of a radar signal to the ground and receipt of a radar return. The intensity correlator uses the radar returns to sense changes in the reflection coefficient of the terrain. Map matching all three modes simulanteously provides an accurate, highly jam resistant position determination for navigation update. [A3619]

"Sonar doppler system with a digital adaptive filter"

A doppler sonar speed measuring system incorporating a digital adaptive filter responsive to the difference in newly received raw speed data and previously received speed data to determine the amount and sign of change of the previously received data. The allowable amount of change increases to a maximum allowed value if the sign of the change remains the same on successive received data as under acceleration conditions and reduces to a minimum value when the sign changes on successive received data. [A3620]

"Adaptive MTI target preservation"

A method of preserving targets in the clear in an adaptive baseband MTI radar system with pulse compression is disclosed. The angle of the weighting signal is determined from the inverse tangent of the inphase and quadrature components of the weighting signal. This angle is then compared to a threshold angle in order to generate a modified weighting signal. [A3621]

"Interrogator-responder communication system"

An interrogator-responder communication system in which responders are carried by vehicles (such as railroad vehicles) travelling along a route and in which an interrogating station situated along the route operates each passing responder to recall data from a memory in the passing responder. In one embodiment, the responder is equipped to receive data transmitted from a transmit station and to store the received data, for later recall, in a non-volatile, electrically erasable read/write memory. [A3622]

"Apparatus for locating and/or tracking stolen or missing vehicles and the like"

An improved vehicle or other object-tracking and location system, preferably, though not essentially, of national scope, wherein transponder or transceiver-equipped stolen or missing vehicles or other objects may be located and/or tracked, as by appropriately-equipped police direction-finding tracking vehicles, through homing-in on periodic transponder reply radio transmissions automatically activated by command activation signals broadcast on the same carrier frequency as the transponder reply signals and with encoded vehicle identification information that causes the intended vehicle transponder so to reply, and with provision for modifying the command signals to require an increased rate of periodic transponder reply signal transmission to assist homing-in on the selected vehicle. In a preferred mode of operation, the verification of whether the reportedly missing vehicle is thus transponder-equipped is preferably established by querying the FBI-NCIC computer system, which will provide the said coded vehicle identification information and automatically cause the appropriate sector or area to broadcast said command activation signals. [A3623]

"Communication system for radar ground systems"

A first plurality of spaced radar ground systems and a second plurality of radar ground systems positioned in between adjacent pairs of the first systems. The first systems, when employed in an early warning radar chain, preferably have antennas which are mechanically rotatable. The second systems are then provided with phased arrays to enable two-way communication without it being necessary to stop any scanning movement of a corresponding first system antenna. [A3624]

"Traffic light control system and method"

Preferred embodiments include a radar traffic light control system with a transmitter/receiver module including an array (103) of interconnected microstrip patch antennas (38) which also act as the resonators for oscillators powered by IMPATT diodes (34, 36) , varactors (158) on the interconnections permit beam steering for scanning roadways. [A3625]

"Distance measuring device"

A distance measuring device transmits a continuous alternating wave from a wave source to a target which reflects it back toward the device. The wave source is activated until such time that a detector associated with the device senses the beginning of the reflected wave at which time the wave source is deactivated. The wave source is deactivated during the time that the reflected wave is sensed by the detector and upon the sensing of the end of the reflected wave, the wave source is again activated. The frequency at which the wave source is alternately activated and deactivated is a measure of the distance between the measuring device and the target. [A3626]

"Radar type underground searching apparatus"

This radar type underground searching apparatus is a system for detecting the presence and location of buried objects such as gas pipes buried in the ground. This apparatus includes a pulse generating unit which periodically generates pulse, and a transmitting antenna through which the pulse is sent into the ground. Pulses reflected from an object in the ground and reaching the ground surface are detected by a receiving antenna, and a reflected wave corresponding to each pulse wave received by the receiving antenna is amplified in a radio-frequency amplifier where in the amplification is increasing each time a group of pulses are transmitted. By sampling the output of the radio-frequency amplifier with a sampler at a series of reflex time, each being succeedingly delayed by a fixed period from the transmitting timing of each pulse wave, as the reference, a low-frequency signal which is formed by extending one reflected wave in time base is obtained, and the waveform thereof is displayed on a waveform display unit. On the screen of the display unit, the presence of objects will be detected by the presence of peaks in the low-frequency signal caused by the reflection from the objects and the depths of the objects will be detected by the time at which the peaks appear on the screen. By this construction, the attenuation of radio waves in the ground can be compensated without arising waveform distortion. [A3627]

"Marine transponder system"

A marine transponder system which is selectively activated to produce a predetermined signal pattern of light/sound/radio transmissions for maritime devices and structures such as navigational aids, mooring, docking or slip facilities and/or EPIRBs and other emergency signalling devices. A remote transmitter is used to broadcast an uncoded or coded signal at a predetermined frequency to activate the marine transponder system. The transponder system includes an RF receiver tuned to the predetermined frequency, and optionally a decoder unit for verifying the coded signal. Upon receipt of the transmitted frequency signal, the transponder system causes an omni-directional light/sound/radio source to be energized to produce the predetermined signal pattern. The marine transponder system may be an add-on adapted for integration with existing navigational buoys, a standalone buoy, a package configured for mounting on a dock, pier or boat, or a package adapted to be mounted on a life vest/preserver. This system permits quick and positive user identification and location of a desired, unknown locus and avoids continuous power usage. [A3628]

"Object detection and location system"

A millimeter wave object detection and location system is disclosed comprising a source generating a millimeter wave signal which is divided into an illumination beam, directed onto a field of view, and a local oscillator portion, mixed with radiation reflected from objects in the field of view. The mixing is performed in a staring array of mixer/detector elements which need not be mechanically or electronically scanned to generate signals responsive to the entire field of view. The detected signal from each element is directly responsive to a portion of the field of view. The oscillator signal is preferably linearly polarized, and a polarizing grid is used to separate the local oscillator signal and illumination beam and direct them in a simple and efficient manner. A twist reflector may also be used to rotate the polarization of a portion of the beam to direct it onto the mixer/detector array for mixing with the received signal from the field of view. Improved constructions of millimeter wave source and mixer/detector elements are also disclosed, which greatly simplify construction of the device. [A3629]

"Microwave plate antenna in particular for Doppler radar"

The antenna constituted by a plurality of identical parallel and symmetrical linear sub-networks (a7, a6, . . . a1, a'1, a'2, . . ., a'7) . The centres of symmetry (b7, b.notident.b, . . ., b1, b'1, b'2 . . ., b'7) of the sub-networks (a7 to a'7) are aligned on a line (c) perpendicular to their diameter and are fed in phase. Each sub-network is constituted by a plurality of radiating elements in even numbers disposed at regular intervals and which radiate from fields displaced from 180.degree. from one radiating element to the following. The pitch of the sub-network is approximately equal to a wave-length guided on the substrate of the printed circuit. Each radiating element is a conducting square surface the side of which is approximately equal to half the guided wavelength with one corner connected galvanically to the feed line. The direction of the surfaces change from one element to the following element. [A3630]

"Method and apparatus for determining the position of a vehicle"

There is provided a system in which a transponder is carried by each vehicle traveling on or above the earth's surface which transmits a signal which is responsive to an interrogation signal to a ground station through two or more satellites and in the ground station, the position of the vehicle is determined from the propagation time differences of the response signals received via the satellites. In this system, the information indicative of the time lag which is required for the transponder to receive the interrogation signal and to transmit the response signal responsive to the interrogation signal is included in the response signal and then such response signal is transmitted. Thus, the time lag which is peculiar to each transponder and corresponds to the time required from the reception of the interrogation signal to the transmission of the response signal can be corrected. With this system, the positioning accuracy of each vehicle can be improved. [A3631]

"Communication receiver"

Disclosed is a communication receiver for use in a burst communication system. A typical system is composed of a transponder and an interrogator. The transponder receiver and interrogator receiver operate in an asynchronous communication mode. The incoming coded signal is down converted to an i.f. frequency compatible with surface acoustic wave (SAW) convolvers. The i.f. signal is then divided between two SAW convolvers, each having a convolution interval of two times the message symbol length (2T) . Reference signals having a bit length of T provided to each of the two convolvers are time reversed to the coded spread sequences and applied to each of the convolvers at a 50% duty cycle. Each of the convolver outputs are processed through log video detection circuits to reduce the dynamic range followed by peak detecting and stretching to reduce the pulse bandwidth. The outputs from each peak detection and stretching circuitry are coupled to a sample-and-hold circuit which are in turn divided such that one path is to synchronization and interrogation sidelobe suppression (also referred to as sidelobe inhibit, ISLI or control signal) matched filters designed to look for the particular symbol sequences between the two convolver channels characteristic of the preamble and ISLI signals. The synchronization signal and the sidelobe suppression signal are used in order to determine if valid synchronization has been detected by the receiver and if the receiver is in a desired portion of the interrogator radiation pattern, if so, then a timing or address signal clocks into a memory the remaining portion of the message which contains the data. [A3632]

"Pulse radar method and apparatus for detecting an object"

An object detection method and apparatus in which, in order to distinguish only an echo wave which is returned back from an object of interest, such as an underground buried object, from those echo waves returned back from another object of objects, the observation signal is divided (an electromagnetic wave as an echo wave) into portions, and the signal portion is converted into a corresponding frequency region to evaluate that spectral distribution and computes frequency parameter values from the spectrum distribution. The object of interest is detected by comparing the reference data of various fields with the parameters of the object of interest, extracting only an echo wave returned back from the object of interest and displaying a corresponding image. [A3633]

"Fish school detecting method or apparatus"

A fish school detecting method or apparatus radiates radio search signals with their carrier frequency in the S-band frequency range, successively in different azimuthal directions through a wide angular range, receives echo signals, and displays the echo signals on the screen of an indicator in such a manner that the echo signal reflected by a bird is clearly distinguished from the other objects, thereby locating the bird and detecting a fish school under the bird. [A3634]

"Radar navigation system"

A low cost electronic navigation system including a Loran receiver and a marine radar unit adapted to receive vessel position information from the Loran. A computer within the radar unit uses successive Loran outputs to display vessel heading and the bearing of objects of interest such as other vessels or waypoints in graphic and numeric form. The navigator may accurately determine the bearing of such objects of interest in magnetic or true form. Other modes are of particular use when the navigator is interested in using the system to maintain a desired course, to avoid obstacles, or to determine if and by how much he must change his present course to return to the desired course. [A3635]

"Vehicle diplex doppler near-obstacle detection system"

A vehicle near-obstacle detector in the form of a diplex Doppler radar system provides range information between a vehicle and an object based on the phase shift between a pair of Doppler signals derived from two transmitted radar signals at slightly different frequencies. A speed dependent error introduced by the time constant of a filter circuit converting duty cycle range information based on the phase shift to an analog signal is compensated by introducing a small time shift in the signal path of one of the Doppler signals to effect a shift in the duty cycle range information. [A3636]

"Signal discrimination system"

The invention provides a system for discriminating between modulated backscattered signals based upon transmission-to-reception time delay. The system employs a carrier, phase-modulated with a modulating signal, having characteristics which provide unity output when correlated with itself with zero time shift and a substantially lower output level when correlated with itself with a significant time shift. The system works with a backscatter-modulator located a finite distance from the transmitter for receiving and modulating the backscatter of the carrier. A receiver/detector receives and detects the modulated backscattered phase-modulated signal, the detector being phase-sensitive and having as a reference signal the transmitted phase-modulating carrier signal, and having as an input signal the phase modulated backscattered carrier. The detector provides an output signal whose averaged amplitude is substantially dependent upon the degree of phase correlation between the phase of the modulation returned input signal and the reference signal. Finally, the output signal from the detector is selectively processed only when its averaged amplitude is above a threshold level. In a preferred embodiment, the transmitted signal is a spread spectrum signal. [A3637]

"Method and apparatus for monitoring ice masses"

A method and apparatus is disclosed for monitoring ice masses wherein a signal transmitter is attached to an ice mass and receivers are used to detect the location of the transmitter. [A3638]

"Blind speed elimination for dual displaced phase center antenna radar processor mounted on a moving platform"

A radar system mounted on a moving vehicle uses a displaced phase center antenna (DPCA) and associated processing for taking the difference between the two signals received by the displaced antennas to provide moving target indication (MTI) by cancellation of the returns from stationary targets. The presence of moving targets is identified by threshold processing within discrete frequency bands. DPCA processing ordinarily results in amplitude nulls or "blind speeds" for targets moving at particular radial velocities. According to the invention, the two signals received by the displaced antennas are summed, weighted and divided into frequency bands which extend through the expected null region in a form of Doppler processing. Threshold processing is performed on DPCA processed signals within certain frequency bands outside of the null regions and on Doppler processed signals within other frequency bands, thereby substantially eliminating the blind speeds. [A3639]

"Method for locating a radio frequency emitter"

A radio frequency emitter transmits pulses in a regular swept beam pattern. As a result of this regular pattern, the angles of transmission of the pulses can be inferred. Intervisibility data of terrain points in a region around an observation point are stored in computer memory. At the observation point, measurements are made of the times of arrival of a plurality of terrain point reflections of a single pulse transmitted by the emitter. These measurements are repeated for a plurality of pulses transmitted by the emitter. In a computer, a comparison is made of the terrain points of reflection calculated from the measured times of arrival for assumed emitter locations with the stored intervisibility data of terrain points. [A3640]

"Aperture radar"

An improved radar is disclosed wherein an array of digital numbers describing a target area is produced. The numbers have values representing differences in ranges between the radar and reflecting points in an area on the ground illuminated by the radar. The values also represent the differences in angles between the radar and the reflecting points. [A3641]

"Radar arrangement"

A radar arrangement which is particularly useful for the terrain following radar of an aircraft avoids disturbances from rain echoes by utilizing an antenna arrangement with a transmitting/receving directional antenna which is circularly polarized. A supplementary receiving antenna of orthogonally-circularly polarized type is used in conjunction with the directional antenna. From a comparison of the signal level distinctions is made between a target and a rain echo. The rain echo can thus be suppressed to give a truer target signal. [A3642]

"Ridge regression signal processing for position-fix navigation systems"

A position estimator for determining the position and velocity of a moving platform in cooperation with radio navigation aids is described incorporating an unbiased estimator, such as a least means square estimator, a biased estimator for determining the angle of inner section of the lines of position from the radio naviation aids for determining the liklihood of geometric dilution of precision (GDOP) and a switch for selecting the estimate of position and velocity from said biased estimator at first times and the unbiased estimator at second times. The invention overcomes the problem of accuracy degredation associated with a nearly collinear measurement geometry which causes the variance of the position estimates to be higly inflated. [A3643]

"M.T.I. radar system"

A moving target indication (MTI) radar which includes TACCAR circuitry or similar means for shifting the frequency of the transmitter/local oscillator, includes a main directional antenna, and subordinate antenna elements for detecting returns from sidelobe directions. The signals from the subordinate antenna elements are modulated, and modulated return pulses are identified and employed to eliminate false pseudo moving target signals which would otherwise be received from the side lobes of the main antenna. [A3644]

"Combined radar and data link"

A first plurality of spaced radar ground systems and a second plurality of radar ground systems positioned in between adjacent pairs of the first systems. The first systems, when employed in an early warning radar chain, preferably have antennas which are mechanically rotatable. The second systems are then provided with phased arrays to enable two-way communication without it being necessary to stop any scanning movement of a corresponding first system antenna. [A3645]

"Traffic monitoring device"

With a traffic monitoring device for photographic recording of vehicles exceeding a predetermined speed, the speed of the approaching traffic is measured substantially against the travelling direction. The vehicles (12) are photographed frontally when they exceed the predetermined speed. Two speed measurements are effected: A first measuring value is obtained in a relatively short part of the available measuring section (22) on the entrance side and serves to release a camera (18) . A second measuring value evaluates all speed measuring values occuring in the measuring section (22) , in which the vehicle (12) is detected by the radar beam (20) . This second measuring value is recorded. [A3646]

"Driver alerting device"

A driver alerting device includes a transceiver adapted for mounting at the rearward end of a vehicle for directing its wave output rearwardly of the vehicle. Return wave signals for many objects within the transceiver range are picked up and supplied to the transceiver by an antenna. Any resultant doppler shift signal is amplified for driving an audio alarm adapted for placement within the passenger compartment of the vehicle. The doppler shift signal also activates a solenoid which applies the air brakes of the vehicle. The circuit is adapted for operative electrical connection to the vehicle transmission or the like for activation only when the vehicle transmission is engaged in reverse gear. [A3647]

"Rapid signal validity checking apparatus"

This invention relates to an improved signal reader for reading signals from transponders placed on moveable objects such as ship containers, automobiles or railroad cars. The reader sends out a continuous signal, which is modified by the information contained in the transponder attached to the moveable object. Multiple antennas, each of which receive separate signals, may be multiplexed at the reader. The improved circuit of the invention provides quick recognition of the receipt of a valid signal from a transponder or, in the alternative, the absence of such a valid signal. [A3648]

"Item identification tag for rapid inventory data acquisition system"

A computerized transceiver repeatedly sweeps through a set of transmit/receive frequencies to interrogate collectively a plurality of groups of items in a stocking area. Items in each group are tagged with a printed circuit transponder tuned to frequencies uniquely assigned to each group. Data returned is stored and combined mathematically by the computer to arrive at the total number of items in each group. The system is particularly adapted for taking inventory of a large number of retail shelf goods using a mobile transceiver. [A3649]

"Communication adaptive multi-sensor system"

A multi-sensor system adaptively utilizes communications or data bus facilities for multi-sensor signal fusion. for each source of sensor signals, a local signal processor compares each signal against a pre-determined set of hypotheses, and generates a ranking value corresponding to each hypothesis. An adaptive interface unit then selects the highest ranking values and transmits them, together with an identification of the hypothesis to which they correspond, through the multi-sensor system communication network or data bus, to the system signal processor. The system signal processor then multiplies the ranking from the various sensors, or adds their logarithms and selects the hypothesis whose product (or logarithmic sum) is greatest. This provides for transmission of the highest ranking hypothesis, or of a selection of hypotheses, to identify the target detected by multiple snsors. [A3650]

"Single chip transponder device"

A transponder device receives a carrier signal from an interrogator unit. This carrier signal, of frequeny F, is rectified by a rectifying circuit in order to generate operating power. Logic/timing circuits derive a clock signal and second carrier signal of frequency F/n from the received carrier signal. This clock signal reads a unique identifying data word from a programmable read only memory (PROM) . The data word is encoded and mixed with the carrier signal in a balanced modulator circuit. The output of the balanced modulator is transmitted to the interrogator unit where it is decoded and used as an identifying signal. The identifying signal identifies the particular transponder device from which it originated. The rectifier and balanced modulator circuits are realized from the same diode elements. All electrical circuits of the transponder device are realized on the same monolithic semiconductor chip. In one embodiment, an antenna receiving/transmitting coil is also part of the chip, being placed around the periphery thereof. In alternative embodiments, various hybrid elements may be connected to the monolithic elements in order to realize additional functions, such as adjustable tuning of the receiving circuit, independent crystal frequency control, and battery-powered operation. [A3651]

"Method and system for locating and correcting the orientation of an autonomous mobile object and a non-autonomous mobile object"

In a method of locating and orienting a first direction linked to the position and to the orientation of an autonomous first mobile object (M) , such as a ship towing a marine geophysical prospecting cable, and a second direction formed by a non-autonomous second mobile object (Bj) , such as a buoy at the trailing end of the towed cable, and at least one reference point on the first mobile object relative to a fixed reference radionavigation system comprising at least two reference beacons (Si, Si+1) the first mobile object (M) and the second mobile object (Bj) are respectively provided with a first communication device (MI) providing communications between the first mobile object (M) and the reference beacons (Si, Si+1) and a second communication device (MJ) providing communications between the first mobile object (M) and the second mobile object (Bj) . They are further provided with a communication device (BIJ) providing communications between each reference beacon (Si, Si+1) and the second mobile object (Bj) . Firstly, the position of the first mobile object (M) relative to the reference radionavigation system and the orientation of the first direction relative to the first mobile object (M) are determined. Then the position of the second mobile object (Bj) relative to the reference radionavigation system is determined. Finally, the angular offset between the first and second directions is determined, with a view to correcting the orientation of the first direction relative to the second direction. [A3652]

"Three-dimensional electro-optical tracker"

Improved performance in an electro-optical tracker is achieved by incorporating range measurements. Further, the tracker uses a Kalman filter in which the target is modeled as the superposition of two Gaussian ellipsoids in space and projected onto an image plane. [A3653]

"Antenna position tracking apparatus and methods"

Apparatus and methods for tracking a positioning system for antennas and other devices. Hardware of the invention contains circuitry which when given velocity information, changes its output position information at a specified rate. The hardware may also be triggered to capture a sample of such output position information to provide feedback to the firmware of the invention, which implements a position tracking algorithm. The algorithm utilizes two consecutive input position samples, the time between those samples and the feedback information corresponding to the last position input sample to calculate the velocity to be applied to the position tracking hardware until a new position input sample is available. When the new sample is available, a new velocity is calculated and applied to the hardware and the process is repeated. Between position input samples, the hardware updates the output position to correspond to the motion of the positioning system. The invention minimizes group delay and allows for more convenient sampling from a remote positioner. [A3654]

"Method for measuring the distance and/or the relative velocity between two objects"

A method of measuring the distance between two objects and/or the speed of one object in relation to the other, the objects incorporating respectively a transmitter-receiver unit and a transponder or reflector, in which method a phase comparison is made between a signal transmitted by the transmitter-receiver unit and a signal received in the transmitter-receiver unit and transmitted from the transponder or reflector. In accordance with the invention the transmitter-receiver unit is caused to transmit signals of microwave frequency, preferably about 2450 MHz, this transmission comprising the transmission of a first signal having a first frequency, the transmission of at least one second signal having a higher or lower frequency, and the transmission of a third signal having the same frequency as the first mentioned signal, wherewith the phase differences .phi. between the transmitted signals are formed, these phase differences corresponding to the distance between the transmitter-receiver unit and the transponder. [A3655]

"Surface acoustic wave doppler detector"

A surface acoustic wave (SAW) radar doppler shift detection system is provided by transmitting a modulation signal having an up-chirp component followed by a downchirp component from a dispersive array SAW assembly to a target, and then receiving the radar return from the target by a receiver which also employs a similar dispersive array assembly. Dispersive array assemblies are constructed with two in line dispersive arrays. The dispersive arrays of the transmitter is positioned relative to two input SAW transducers and two output SAW transducers such that a pulse signal supplied to the two input transducers results in an expanded signal of the output transducers. The expanded signal acts as a modulation signal which is multiplied by an RF and transmitted. The receiving array assembly detects the radar return signal, and, after it is multiplied down to the SAW frequency, compresses it. When the target is stationary relative to the transmitter and receiver platform, a single envelope will be detected which indicates that no doppler shift has occurred. When there is relative motion between the target and the platform, the spacing between two detected envelopes, and their relative shifts, is measured and utilized to provide an indication of the magnitude and direction of the doppler shift. The transducers of the array assembly are formed of hyperbolically shaped fingers to provide a wideband range of frequencies. [A3656]

"Coherent pulse radars"

A coherent pulse radar is activated successively according to at least two pulse repetition frequencies. These frequencies are of values such that (a) the received signal is ambiguous both with regard to distance and with regard to velocity, and (b) their ratio is reducible to the quotient of two integers which are preferably adjacent and have no common factors. for the frequency analysis, a number of samples is taken which depends upon the pulse repetition frequency, the numbers of samples associated with the two pulse repetition frequencies being, in relation to one another, in the ratio of the two integers. The distance/velocity resolution cell is then invariant with respect to the pulse repetition frequency, this permits removal of the ambiguity concerning mean information items appertaining to a long integration time. [A3657]

"Antenna system"

A side-looking array antenna system is disclosed in which the inclination angle of the antenna main beam is determined depending on the intervals of a plurality of antenna elements forming an array. A switch is provided to selectively connect one of the ports of an antenna feeder to a signal source or the like. The switch is used to select one of the ports of the antenna feeder as an excitation port, thereby reversing the direction of inclination of the antenna main beam. The antenna main beam can thus be directed in either of the two directions by the operation of the switch. Also, by using this antenna system, a Doppler radar vehicle speedometer with small calculation error, automotive radar and the like may be simply configured. [A3658]

"Tracking radar system"

In a tracking radar system target glint and multipath sometimes produce signals which falsely indicate high acceleration rates of the target. These signals cause the boresight of the antenna to be driven away from the direction in which the target actually lies. To avoid this problem, received signals from a receiver are fed through a switch which is opened whenever the target appears to have an acceleration or velocity above a threshold value. The threshold value is varied so that the proportion of the time during which the switch is open is kept approximately constant. Thus, if there is a period during which a large number of high acceleration or high velocity signals appear from the receiver (for example is there is a very high noise level) the switch still remains closed for a certain proportion of the time period. This ensures that the tracking system never loses the target while also ensuring that false tracking due to target glint and multipath is minimized. A circuit is included so that, when the switch is open the antenna is not brought to a complete halt but rather is allowed to continue to move in the direction that it was moving before the switch was operated. [A3659]

"Method of imaging an object by ultrasonic or electromagnetic waves"

A method of imaging an object by the ultrasonic or electromagnetic wave by mechanically or electronically scanning the ultrasonic or electromagnetic wave transmitting/receiving system to transmit the ultrasonic or electromagnetic wave beam spreading in space of the object and using the trace (TOF locus) from the transmission to the reception while receiving the reflected wave from the object, and sequentially reproducing the line image at the central line of the synthetic aperture range using the received signal group from the scanning points in the synthetic aperture range to sequentially image the area to be imaged while scanning the ultrasonic or electromagnetic wave transmitting/receiving system. An imaging apparatus applied with the method has a relatively simple hardware structure for reproducing the image and is also able to perform the operation in real time. [A3660]

"System for detecting underground objects"

A system for detecting underground objects which uses reflected wave profile data collected for obtaining a detected image output and subjects the data to a sequence of synthetic aperture processing, in which set values of the dielectric constant are successively varied, and obtains the actual dielectric constant of the soil in which the targets are buried by evaluating the results of the synthetic aperture processing, whereby the need for special data collecting work only for obtaining the actual dielectric constant is eliminated. [A3661]

"Doppler radar method and apparatus for measuring a projectile's muzzle velocity"

A muzzle velocity chronograph method and apparatus for providing an accurate and precise measurement of the muzzle velocity of a projectile ejected from a gun. A conventional radar Doppler signal is sampled and digitized and arranged in a succession of groups, each group representing a separate time period. A fast-Fourier transform is then computed for each group of samples, and peak frequency measurements in the transformed data are tracked from one time period to the next. These peaks indicate the velocities of the projectile of interest and any other nearby moving objects. Finally, a least mean square error curve fit and standard regression algorithm are used to deduce the projectile's initial, muzzle velocity. The invention provides accurate muzzle velocity determinations even in circumstances where the Doppler signal contains substantial interference caused, for example, by random noise and the presence of moving fragments in the direction of the projectile. [A3662]

"Near-field monostatic intrusion detection system"

The invention comprises a plurality of monostatic devices for radiating and receiving signals. The monostatic devices are disposed in a vertical spaced relationship such that signals from each device follow a direct path to an object to be detected and a reflected path to the object to be detected. The reflected path includes a path to a surface below the object and a path from the surface to the object. The signals are then reflected from the object and return through both the direct and reflected path. The monostatic devices may be radar antennas or acoustic transmitters. [A3663]

"Weather radar with turbulence detection"

A weather radar turbulence detector using a magnetron for transmission and having pulse pair processing. The invention is a high-power, low cost turbulence detector incorporating ground clutter rejection and sea clutter rejection. Autocorrelation among echoes, to note their amplitude variations, which are detected video, rather than RF, from a simple and low-cost receiver, from pulse to pulse of the transmitter, is accomplished by the pulse pair processing. [A3664]

"Short range ranging system"

An accurate ranging system for position determination of a mobile unit using trilateralization. A pair of active reflectors return signals transmitted by the mobile unit in phase at the reflectors, after compensating for interval circuit delay. The mobile unit compares the phases and determines mutual distances and thus its position. The invention includes a two frequency technique for compensating for inaccuracies introduced at distances in excess of one wavelength and for inaccuracies observed at a large multiple of wavelengths, and also includes means for dynamically compensating for drift. [A3665]

"Obstacle proximity detector for moving vehicles and method for use thereof"

A proximity sensing and indicating system for use in automobiles for instance to provide a warning signal to both the car driver and possibly other drivers that the car so equipped is approaching an obstacle at an unsafe speed and/or is getting too close thereto. The system operation is autonomous and is not monitored by the driver once the system is turned on, it responds only to the presence of an obstacle located ahead of the vehicle. The system detects the differential velocity between the car and the obstacle and determines the distance separating the car from the obstacle which may be fixed or moving in a general direction substantially oriented in the same direction as that followed by the system-equipped vehicle. A signal is generated whenever the combination of differential velocity and separation distance reaches an unsafe level. This signal may be processed so as to emit various types of signals that can be seen, heard and/or be used for taking emergency action such as causing the vehicle brakes to be applied automatically if the driver does not heed the passive signals already emitted. Provisions are built-in to prevent the driver from turning off the system after the emission of a signal has been initiated. [A3666]

"System for detecting underground objects"

A system for detecting underground objects is disclosed wherein image data obtained through a deep range-migration correction and image data obtained through a shallow range-migration correction are combined so that data at the corresponding positions on both the image data at high level may mutually intensify, whereas other data may mutually weaken. The target spot on the thus combined image data is made sharp and provides sufficently high resolution. [A3667]

"Recursive radar clutter filter"

A recursive radar filter arranged to provide filtering of ground clutter signals from radar echoes in the form of short batches of pulses. The filter includes a feed-forward section with delay, adder, and fixed amplifier elements. The filter also includes a feedback section which includes similar elements. Two time-varying amplifiers are included in the filter which change gain as the pulses are applied to the input of the filter. In a three delay version of the filter, the gain of one of the time-varying amplifiers is such that the feed-forward section of the filter does not pass any pulses until the fourth pulse has been applied to the filter. After the third pulse, the gain of this time-varying amplifier increases on each successive input pulse. In another embodiment, the two time-varying amplifiers are eliminated by making all of the fixed gain amplifiers time-varying in relationship with the interpulse period of the pulse input signal. Both arrangements allow recursive filtering without the need for extra pulses or pulse tapering to control transients in the filter. [A3668]

"System for detection of objects with given, known characteristics against a background"

The invention is primarily addressed to the problems relating to the detection and identification of vessels against the sea area. A radar sensor connected to powerful data processing equipment can give a monitoring capability having been impossible hitherto, by employing optimal radar structures and signal processing algorithms. There is described which functions which may be operated independently on the transmitter side and the receiver side. Depending upon the purpose such a radar may be applicable for: searching for vessels, searching for wake traces, simultaneous searching for vessels and accompanying wake traces, tracking vessels and wake traces, identifying vessels based upon various filters. As a consequence of the data control such a radar or possibly a corresponding sonar system may be able to reconfigurate as needed, which involves that the requirement for signal processing is reduced and the utilization of the resources improved. In order to form an interference pattern corresponding to the object or objects to be detected, transmitter means and/or receiver means in the system comprise two or more apertures (7A, 7B, 8A, 8B) for the coherent transmission and reception respectively of waves, the mutual distance between these apertures being larger than one wavelength of the waves transmitted. [A3669]

"Medium distance measurement system and method"

A system and method are disclosed for measuring medium range distances, of about 1-10 meters, to a target. A transmission signal is reflected off the target, with the phase difference between the transmitted and received signals taken as an indication of the target distance. The transmitter and receiver are part of a phase-locked loop, with a VCO adjusting the transmission frequency until a predetermined transmission-reception phase difference is reached. A coarse distance measurement is first obtained by comparing the transmitted signal with the received signal, followed by a fine distance measurement in which a multiple of the transmission signal frequency is compared with the received signal. The frequency multiplication in the preferred embodiment is obtained by dividing the VCO output frequency to obtain the transmission frequency. The transmission signal is initialy set at a low frequency prior to the coarse adjustment to avoid phase ambiguities. Numerous different types of transmission signals can be used, although optical signals are preferred. The invention is particularly adapted for robotics applications. [A3670]

"Apparatus for controlling the opening and closing of doors"

An arrangement for controlling operation of a motor operated door is provided with doppler radar sensors facing the approach to the door from both sides. The doppler signals from the sensors are analyzed to determine the presence of motion toward or away from the door and the door is controlled to open upon motion toward the door and close upon motion away from the door. [A3671]

"Multiple-fixed-frequencies navigation system"

A radio navigation system is disclosed which uses multiple fixed frequencies for calculating the bearing and distance of a local station from a central station. The central station has a receiver and an array of fixed, directional antennas all transmitting signals at different frequencies. The local station has a transmitter for transmitting a query signal to the central station, a plurality of local receivers to receive signals from the antenna array, and a stored-program processor. Each of the local receivers operates at a fixed frequency substantially equal to the frequency at which its respective central transmitter and central antenna is operating. A stored-program processor measures the elapsed time between receipt of the query signal from the local station and receipt of a navigational signal from the central transmitters and, using this data, calculates the distance between the local station and the central station. The stored-program processor also compares the relative signal strengths of the signals received by the local station from the various antennas in the antenna array of the central station and, using this data, calculates the bearing of the local station from the central station. [A3672]

"Method of and system and apparatus for locating and/or tracking stolen or missing vehicles and the like"

An improved vehicle or other object-tracking and location system, preferably, though not essentially, of national scope, wherein transponder or transceiver-equipped stolen or missing vehicles or other objects may be located and/or tracked, as by appropriately-equipped police direction/finding tracking vehicles, through homing-in on periodic transponder reply radio transmissions automatically activated by command activation signals broadcast on the same carrier frequency as the transponder reply signals and with encoded vehicle identification information that causes the intended vehicle transponder so to reply, and with provision for modifying the command signals to require an increased rate of periodic transponder reply signal transmission to assist homing-in on the selected vehicle. In a preferred mode of operation, the verification of whether the reportedly missing vehicle is thus transponder-equipped is preferably established by querying the FBI-NCIC computer system, which will provide the said coded vehicle identification information and automatically cause the appropriate sector or area to broadcast said command activation signals. [A3673]

"Friend-foe interrogation method and a system using this method"

For carrying out an interrogation a position modulated laser light wave is used. A key word is displayed in an interrogator and coded in accordance with a cyclic code, for example Golay's code. This coded key word is used for modulating the laser wave. In the responder the same key word is displayed and coded in the same way. After reception and demodulation each message is compared in a correlation circuit with the local reference word. The correlation method used allows parasite pulses to be taken into account and the word received to be validated with a given security threshold. [A3674]

"Method and apparatus for combining waveforms"

A method and apparatus for producing data indicative of the presence of buried objects, wherein two waveforms I (t) Q (t) are combined with two reference waveforms Ir (t) Qr (t) using filters 10, 12, 14, 16 of two types A, B. Type A has time response Ir (-t) and type B has time response Qr (-t) . The products {I (t) @Ir (t) }.multidot.{Q (t) @Qr (t) } and {I (t) @Qr (t) }.multidot.{Q (t) @Ir (t) } from multipliers 18, 20 are subtracted to give V1 and added to give V2 in the combiner 30. A list of object distances (36) is derived from V1. A list of object orientations (46) is derived from V2. Object times (34) are used to section V2 at (40) on a time basis. A correlation operation is represented by @. The invention is particularly applicable to location of buried pipes using ground probing radar, but is also useful in locating planar objects and in other systems. The waveform combination suppresses noise and clutter. I (t) and Ir (t) are quadrature versions of Q (t) and Qr (t) . The emitted radiation is circularly polarized. [A3675]

"Crystal controlled magnetron"

The invention comprises a weather radar system in which a magnetron transmitter is controlled in frequency by injecting therein a low power locking signal from a stable frequency source. Frequency lock between the source and the magnetron is maintained without requiring injection signals of excessive power by an automatic frequency control (AFC) . The AFC determines the frequency and phase error between the injection signal and the magnetron output and adjusts the frequency of the source so as always to be within a narrow band of frequencies centered about the natural frequency of the magnetron. Over the long term, therefore, the frequency of the source will vary by an amount equal to the change in the natural frequency of the magnetron occurring during that time. Over the short term, however, the difference in frequency between the injection signal and the magnetron output is zero, while the phase difference is less than 90.degree.. The frequency source controlling the magnetron also serves as a frequency source for generating the several local oscillator frequencies required by the system receiver. Thus, the pulse to pulse transmitted signals, return signals and receiver i.f. signals all possess a high degree of phase coherence, readily permitting detection and determination of the doppler frequencies contained in the return signals. [A3676]

"Tracking circuit for following objects through antenna nulls"

A circuit for removing abrupt phase changes in a received signal, such as those caused when an object tracking system's directional receiving antenna becomes misaligned with the tracked object. The circuit uses a phase detector to determine when an abrupt phase change has occurred, such as when a signal returned from the tracked object aligns with an antenna null and reverses the phase of a control signal fed to a phase locked oscillator. A delaying low pass filter insures the control signal is stable before it is fed to the phase locked oscillator. [A3677]

"Method and apparatus for measuring distances"

A method for measuring the distance between a first object, which incorporates a transmitter-receiver unit, and a second object, which incorporates a transponder. In accordance with the invention there is transmitted from the transmitter-receiver unit (19) a first microwave signal (S1) , which is received in the transponder (18) . A second signal (S3) of much lower frequency F.sub.m is generated in the transponder and is modulated on a signal (S6) of microwave frequency in the transponder to form a modulated signal (S7) . The modulated signal (S7) is transmitted from the transponder to the transmitter-receiver unit (19) , where it is received and mixed down with the first signal (S1) and thereafter is (a) low-pass filtered to form a first measuring signal (S10) having the frequency F.sub.m, the phase of which corresponds to the phase difference between the first microwave signal (S1) and the microwave signal (S8) received in the transmitter-receiver unit (19) and (b) de-modulated, thereby to form a second measuring signal (S12) having the frequency F.sub.m, the phase of which corresponds to the phase of the second signal (S3) generated in the transponder (18) . The phases of the two measuring signals (S10, S12) are compared in a phase comparison circuit (27) to form a difference therebetween, this difference being proportional to the distance between the objects. [A3678]

"Driver alerting device"

A driver alerting device includes a transceiver adapted for mounting at the rearward end of a vehicle for directing its wave output rearwardly of the vehicle. Return wave signals for many objects within the transceiver range are picked up and supplied to the transceiver by an antenna. Any resultant doppler shift signal is amplified for driving an audio alarm adapted for placement within the passenger compartment of the vehicle. The circuit is adapted for electrical connection to the back-up light circuit of the vehicle for activation only when the vehicle transmission is engaged in reverse gear. [A3679]

"Driver alerting device"

An alarm device for a construction vehicle including a transceiver adapted for mounting at the rearward end of a vehicle for directing its wave output rearwardly of the vehicle. Return wave signals for many objects within the transceiver range are picked up and supplied to the transceiver by an antenna. Any resultant doppler shift signal is amplified for driving an audio alarm positioned on the vehicle. The circuit is adapted for electrical connection to the reverse gear of the vehicle for activation only when the vehicle transmission is engaged in reverse gear. [A3680]

"Motor vehicle locator system"

A system is disclosed for identifying the location of a parked and unattended motor vehicle. When user actuated, the sought-after vehicle will emit a distinctive, user programmable audible and/or visual attention getting signal. Such a signal is preferably produced by standardly furnished vehicular equipment (e.g., horn and headlights) . The system utilizes a radio frequency operated communications link between the operator and the vehicle which is also user programmable. Such programmability allows the user to select one of a plurality of possible link operating frequencies thus greatly reducing the likelihood that his system will inadvertently actuate similar nearby systems. [A3681]

"Radar system"

Where reflection coefficient k of the surface of the sea is in a relatively wide range and as the ratio of the antenna height to the wavelength is larger, a radar system can eliminate ambiguities in measuring a target height of a low elevation angle on the sea surface. An antenna receives two beams, one beam having slightly different elevation angle from the other. An antenna direction adjusting mechanism adjusts, on the basis of tan.sup.-1 (ha/R) , a direction in which receiving sensitivity of one of the beams is equal to receiving sensitivity of the other beam, so that this direction aims at mid point between the target and the image of the target. The phase difference between the two beams is obtained with respect to two different frequencies. Two series of data of the target height are obtained each on the basis of the respective phase difference. These series of data are compared on term-to-term basis for two terms nearly equal to each other for extracting one of the two terms as the true height of the target. [A3682]

"Doppler radar kinemometer"

The invention concerns a Doppler radar kinemometer intended to measure the speed of a railway vehicle. According to the invention, it includes two antennas (1,2) mechanically connected to one another such that their axes form a determined angle between them. This angle is preferably between 60.degree. and 120.degree.. for safety operation, the antennas are each supplied with ultrahigh frequency waves (F1,F2) by their own wave generators (4,5) , and each furnishes corresponding Doppler frequencies (Fd1,Fd2) to a distinct processing unit (11,12) , with the signals coming from these two processing units then processed within a computing assembly (15) which supplies the value of the measured velocity. [A3683]

"Collision avoidance system"

The operation of a positive finding collision avoidance system at an Own station that determines Own's and Others' positions from SSR interrogations and replies thereto is initialized by briefly transmitting interrogations from Own station and receiving non-garbled replies thereto from Other stations to determine their direct ranges from Own. The range data is used in a trigonometric computation to obtain Own's and such Others' initial positions. Interference with the normal operation of the standard ATCRBS is limited to a minimum by transmitting from Own very briefly and only when necessary. The distance between pairs of SSRs is also computed. [A3684]

"Doppler radar velocity measurement apparatus"

Doppler radar apparatus for use in a velocity measuring system for farm tractors and the like. The apparatus includes a dual mode conical horn having a flare angle substantially in excess of 12.5.degree., and a dielectric lens formed of a glass filled polymer. The doppler output signal provided by the RF transceiver associated with the dual mode horn is high pass filtered to remove low frequency signals therefrom. The horn is mounted in such a way that it is isolated from mechanical vibrations which would induce doppler signal frequencies in excess of the cutoff frequency of the high pass filter. Moreover, the horn assembly (which is aluminum) and a steel housing assembly are coupled together in such a way that thermal expansion and contraction will not loosen the friction fit between the two assemblies. The two assemblies are held together by a single, large diameter annular locking ring. [A3685]

"System and method for detecting intervehicle distance of two vehicles moving in the same traffic lane"

The system and method for detecting an intervehicle distance to a preceding vehicle which is moving on the same lane as the vehicle, means for radiating and sweeping an electromagnetic wave such as a laser beam toward the moving direction of the vehicle is provided, with the confirmation of a lane on which the vehicle moves on the basis of a comparison of their sweep angles to reflectors located on both ends of a road on which the vehicle moves from a center axis of the vehicle's movement direction, the traffic lane on which a vehicle moving in front of the vehicle moves is determined on the basis of their sweep angles of the electromagnetic wave with respect to the vehicle from the other vehicle moving in front of the vehicle to the reflectors located on both ends of the road and having the same distance to the vehicle as the other vehicle, and the intervehicle distance data is outputted upon determination that both vehicles move on the same traffic lane, a correct intervehicle distance from the vehicle to the preceding vehicle can thus be measured. In addition, the center axis is corrected according to a steering angle of the vehicle's steering wheel. [A3686]

"Process and device for limiting traffic to be used with an interrogation/response system such as a secondary radar or IFF system"

The process for limiting traffic according to the invention comprises an and input gate receiving the incident pulses representative of the interrogations of the system, its output being connected to an authorization output as well as to a counter which is itself connected to an adder and to a counter, the adder receiving from a memory criteria values, and its output being connected via a reference values memory to the comparator, the output of which is connected via a memory to the said and gate. [A3687]

"Shield tunneling system capable of electromagnetically detecting and displaying conditions of ground therearound"

In a shield machine, there are provided an electromagnetic wave transmitting and receiving unit mounted on the top of the shield machine for radiating electromagnetic impulse wave toward an underground and for receiving the electromagnetic wave reflected from the underground, and a position sensor for collecting an information regarding the position of the electromagnetic wave transmitter and receiver unit. Data processing unit is provided for processing the signals from transmitter/receiver and the position sensor and sent through a transmission line. The data processing unit continuously displays the condition of the underground at the cutting face. [A3688]

"Radar device for measuring the distance of the device to a surface"

This radar device for measuring the distance h of the device to a surface (2) includes transmission means (5) for transmitting to the surface a frequency-modulated wave E (t) provided by an oscillator (14) having a frequency control, receiving means (7) for receiving this wave R (t) reflected from the surface, a mixer circuit (10) for producing a beat wave between the transmitted and received waves and a processing circuit (20) including a beat-wave-digitizing circuit (25) and a time-frequency transform operator (27) for supplying frequency components from which the distance h is determined. This processing circuit (20) further includes an auto-correlation operator for effecting an auto-correlation of the beat wave digitized by the circuit (25) and also spectrum processing means (32) for finally determining the distance h. [A3689]

"System for measuring height distributions of atmospheric temperature, wind direction and wind speed"

A system for measuring height distributions of atmospheric temperature and wind velocity (wind direction and wind speed) utilizes the facts that a sound wavefront in the atmosphere constitutes part of an ellipsoidal surface and that there always exists a normal which passes through an interior point of the ellipsoid. The Doppler radar is capable of measuring a height distribution of wind velocity on the basis of Doppler frequencies of scattered waves produced by the atmospheric turbulence. The radar and generator are arranged on a straight line in the wind direction so that a radio wave from the radar is directed to the wavefront of a sound wave from the generator. The radar antenna beam is scanned so that it perpendicularly intersects the sound wavefront. The speed of the sound wavefront is measured from the Doppler frequencies of reflected waves. The sound speed is obtained by removing the wind speed component from the measured speed of the sound wavefront. The sound speed obtained is calculated in terms of atmospheric temperature, thereby obtaining the height distribution of the atmospheric temperature. [A3690]

"Terrain profile radar system"

Stable measurement of terrain-height variations is provided by this radar system which employs a very low power spread spectrum transmitted signal which, after reception, is processed digitally for extremely stable and predictable performance. The system also includes an automatic power control circuit to maintain the transmitted power at the minimum required level. [A3691]

"Speed sensor and head-mounted data display"

A transmitter is mounted for movement with a skier or other self-propelled sportsman and transmits ultrasonic or electromagnetic waves toward the stationary medium over which the skier or sportsman is moving. An element of the same transmitter or a separate transducer detects waves reflected from the stationary medium. A computer calculates the speed of the skier or sportsman from the Doppler shift of the reflected waves and actuates a readout unit to indicate the speed to the skier or sportsman. The readout system has a head-mounted display including a character generator and a semitransparent reflector in which the character generator is viewed so that the speed indication appears superposed over the normal background in the viewing direction. [A3692]

"Method and system for automatically detecting a preceding vehicle"

A method and system for detecting a presence of a preceding vehicle moving in a front detection area of a controlled vehicle. In the method and system thereof, a plurality of laser or other kinds of beams are transmitted to any object present in the front detection area and the plurality of reflected beams are received so that the respective distances to the reflecting objects are measured on the basis of the propagation delay times between the transmission and reception of the beams. In the method and system thereof, each absolute difference between the current value of distance measured by any one of the beams and any one of previous value of distance measured by the corresponding or another one of the beams before a predetermined time (corresponds to an interruption time of a processing routine) is calculated and compared to a predetermined distance value which is relatively small in order to determine that the preceding vehicle which has been detected by any one of the beams within the predetermined time is the same as that which is currently detected by any one of the beams. Therefore, the presence of the preceding vehicle can accurately be detected without mistaking the preceding vehicle for another vehicle moving on a different traffic lane or as a stationary object located at either side of a traffic lane. This is true even when the controlled vehicle and preceding vehicle move on a curve road. Vehicle speed can be controlled to track the real preceding vehicle. [A3693]

"Method and apparatus for measuring distance"

A signal is transmitted from a first location to a remote second location where a target carrying a transponder is positioned. The transponder re-radiates the signal to the first location where it is received. A phase comparator generates from the transmitted and received signals a measurement of their phase difference which is functionally related to the distance between the first and second locations. In one embodiment, the transponder is a passive parametric oscillator, being powered by energy received from the transmitted signal, which generates and transmits a subharmonic of the transmitted signal. [A3694]

"Method for the in-line measurement of background noise for MTI radar with suppression of samples not originating from noise, and digital device embodying said method"

Apparatus is provided for the automatic in-line measurement of background noise for MTI radar with automatic suppression of samples not originating from noise. The background noise level is determined by making use of summing and shifting operations only, and the suppression of samples not originating from noise is obtained by utilizing the information derived from a normal radar detector so that samples identified as true targets shall not contribute to the calculation of background noise level. The apparatus comprises a multiplexer circuit (22) , a first shifting circuit (23) , a storage element (24) , a second shifting circuit (25) , an inverter (21) , and a counter (26) . [A3695]

"Interactive television and data transmission system"

A spread spectrum system provides bidirectional digital communication on a vacant television (TV) channel for simultaneous use by more than 75,000 subscribers using time and frequency division multiplex signals locked to horizontal and vertical sync pulses of an adjacent channel Host TV station. The system, whose operation is analogous to a radar system, comprises: (1) the Host TV station to send down-link sync and data pulses to subscribers during the horizontal blanking interval (HBI) , (2) subscriber "transponders" which detect those signals and transmits up-link "echo" data pulses only during the HBI to eliminate interference to TV viewers, and (3) a central receiver which also uses the host TV sync pulses to trigger range gates to detect the up-link data pulses. In a preferred embodiment the central receiver employs directional antennas to determine direction to transponders and to define angular sectors partitioning the service area into pie-link "cells" which permit frequency re-use in non-contiguous sectors (like cellular radio) . The system thus operates like a radar to measure elapsed time between receipt of TV sync pulses and receipt of transponder response pulses and measures bearing to transponders to thereby determine the location of fixed or mobile subscribers as well as provide data links to them. Transponders may share user's existing TV antenna or may operate on cable TV and could be packaged and "RF modems" for personal computers, as transceivers for mobile or portable use, or they may be integrated with a TV receiver to provide "interactive television". [A3696]

"Remote sensing apparatus for satellites"

The invention relates to remote sensing from a satellite of a parameter in one or more regions on the ground adjacent the satellite ground track by radar transmission. The purpose of the invention is to reduce energy consumption and optimize measurement accuracy. A transmitter antenna generates a plurality of pencil radar beams which illuminate respective cells of the region. A control means successively energizes the antenna at respective frequencies for respective pulse durations and for respective number of pulses. The invention is particularly appliable to scatterometer apparatus for responding to wind speed and direction by sensing radar backscatter from sea. [A3697]

"Antenna assembly for microwave reflection survey equipment"

An antenna assembly is provided for use in locating buried objects, particularly long thin objects such as pipes can be located, determining the position, and ascertaining the pipe direction by taking measurements from a single point, without mechanical movement of the antenna, and allowing a better suppression of spurious signals and reduction in false indications, which assembly has a plurality of antenna arms adapted and arranged to transmit and receive radiation into the ground and is characterized in that the arms have, on at least the surface nearest the ground, a cladding of a substantially lossless dielectric material, the relative permitivity of said dielectric being at least 3.5 and the thickness of said coating being at least .lambda..sub.d /20 where .lambda..sub.d is the wavelength of lowest frequency of the radiation to be transmitted from the antenna. [A3698]

"Electronic surveillance and identification"

An electronic article surveillance and identification system employing a transceiver (10,11) for broadcasting an interrogation signal into a zone to track the location and movement therein of inventory, merchandise, vehicles, animals, people and objects carrying passive (unpowered) transponder tags (12) adapted to receive the interrogation signal, process the signal in an encoded surface acoustic wave device (15) having a predetermined pattern of reflection groove or grating transducers (30-39, 40-72) and echo an encoded response signal to the transceiver. [A3699]

"Reflective array surface acoustic wave device"

A reflective array surface acoustic wave signal compressor or expander (RAC) has a piezoelectric substrate (LiNbO.sub.3) upon which is deposited an input transducer and an output transducer and etched therein a reflective grating. The RAC grating comprises reflective elements which includes a plurality of grooves having either uniform depths and lengths and preselected widths or uniform depths, lengths and widths for producing a flat pass band or a desired frequency characteristic. Yields are increased owing to the simplified fabrication process and costs decreased owing to batch fabrication made possible by the resulting simplified fabrication-process. [A3700]

"Satellite-based position determining and message transfer system with monitoring of link quality"

A radio position determination and message transfer system is implemented using a number of satellites in geostationary orbit for relaying interrogation and reply signals between a ground station and a user-carried transceiver. Message information can be exchanged between a given user transceiver and the ground station, as well as between different user transceivers. The user transceiver is provided with means for monitoring the quality of the radio communication link between the transceiver and one or more of the satelites, based on errors detected in the received interrogation signals. The transmission of a reply signal by the transceiver is enabled only when the link quality is found to be acceptable. The reply signal may contain message information or may constitute a request for a position fix. In the latter case, the transceiver may be configured to await favorable link quality to more than one satellite before the reply signal is transmitted. [A3701]

"Target position radar"

A traffic radar unit capable of looking past the lead vehicle of oncoming traffic and discovering and identifying a violator employs master and slave antennas having diverging boresights that provide overlapping relative power density radiation patterns. The radar return signal from a target of interest is received by each antenna to produce two independent Doppler signals of the same frequency which are processed by respective master and slave signal processing channels. In the illustrated embodiment, a reference boresight is established in the overlapped patterns such that a target position along the reference boresight occurs at the time that the amplitudes of the two Doppler signals are equal. Controllable high pass filters whose passbands are shifted upwardly in response to return signals of increasing amplitude attenuate stronger, lower frequency interfering signals. The presence of a second Doppler signal in either channel having a frequency near the signal of interest causes the receiver to abort the tracking mode. [A3702]

"Stolen object location system"

A stolen object location system having a base station, a location network and an object unit which is associated with the object to be located. The location system is capable of operating in a plurality of different location modes ranging from simple triangulation to LORAN. The base station, upon being notified that the object has been stolen, will transmit a locate request message to the object unit specifying the location mode to be used and the transmission frequency of the object unit's transmitter. An electronic control in the object unit will control the operation of the object unit's receiver and transmitter in accordance with the location mode and transmission frequency specified in the locate request message. The electronic control will also initiate the transmission of an alarm message if the object unit loses communication with the base station, and is capable of transmitting a tattle-tale message, effectively relaying the alarm message of another object unit if the base station does not respond to the other object unit's alarm message. [A3703]

"Method and arrangement for the suppression of rain echos in a terrain following radar"

To suppress rain echos in a terrain tracking radar with elevation monopulse devices, the signal in the difference channel is amplified by a predetermined factor. By comparing the level of the sum signal with the amplified difference signal, conclusion is reached about the presence of a ground echo or a rain echo. The factor should preferably be automatically adjustable according to the level in the sum channel. [A3704]

"Passive interrogator label system with a surface acoustic wave transponder operating at its third harmonic and having increased bandwidth"

A "passive interrogator label system" (PILS) is disclosed with passive, SAW transponders which are capable of receiving an interrogation signal, processing this signal and transmitting a reply signal that is derived from the interrogation signal and contains encoded information. The SAW transducers employed in the transponders are operated at their third harmonic and comprise split fingers which reduce SAW reflections. These transducers are also shaped to increase their bandwidth and to reduce their capacitance. The bus bars connecting the transducers are formed of double thickness to reduce ohmic resistance losses and these bus bars as well as the transponder phase delay pads have two levels of serrations on their edges to substantially cancel reflections. SAW reflectors in the transponder are provided with shorts between successive fingers to reduce ohmic resistance losses and to render them less susceptible to fabrication errors. [A3705]

"Inductive antenna coupling for a surface acoustic wave transponder"

An arrangement is disclosed for coupling electrical energy into and/or out of a surface acoustic wave (SAW) device, such as a transponder. The SAW device has two input/output terminals electrically connected to at least one transducer for converting between electrical energy and SAW energy. Such transducer presents to the terminals a prescribed capacitance in the frequency range of operation. An inductive loop, formed by at least one turn of an electrical conductor, is connected to the two input/output terminals of the SAW device. The inductance of the loop is made substantially equal to the prescribed capacitance at the frequency range of operation, thus forming a resonant circuit with the SAW device. The loop also forms a protective DC short circuit across the two terminals, preventing build-up of static electricity. The inductive loop is inductively coupled to an antenna capable of receiving and/or transmitting radiation in the frequency range of operation. [A3706]

"Position finding and collision avoidance system"

A position finding and collision avoidance system derives, at an Own station within the service area of an identified SSr at a known location, differential azimuth (A) , differential time of arrival (T) , identity and altitude data regarding any transponder-equipped Other station or stations within a predeterminable region surrounding Own station, from standard ATCRBS interrogations and replies. These data are used to compute the positions of Other stations for display at Own station. [A3707]

"Method for position-finding and apparatus herefor"

A method for determining a mutual position between two objects, comprising transmitting a microwave signal from the first object towards the second object, causing the second object to receive the transmittal signal and re-transmit a signal, which is caused to be received by the first object. According to the invention the first object includes a transmitter/receiver unit (S/M-unit) , which transmits the aforesaid signal (f.sub.o) from a transmitter antenna. The second object (T) is caused to re-transmit the aforesaid signal modulated with a signal (f.sub.m) , the first object being caused to receive the transmitted signal through at least two antennae (M.sub.1, M.sub.2) placed symmetrically on a respective side of the transmitter antenna (S) and in an antenna plane common with the transmitter antenna (S) . The angle (.theta.) between the antenna plane and the second object, at least in one dimension, is determined by a phase comparison or an amplitude comparison of received signals, in dependance on whether or not the second object (T) is located in the so-called proximity zone of the first object. The invention also relates to apparatus for carrying out the method. [A3708]

"Radar echo discriminating device"

A radar echo discriminating device for separating in the video signal of a pulse-type meteorological radar the rain echoes from the echoes due to the ground comprises fluctuation calculating means for subtracting the amplitude of the incident video signal corresponding to a given pulse emitted by the radar from the amplitude of a stored video signal corresponding to a pulse previously emitted by the radar, whereby the signal obtained after this processing represents only the rain echoes, whereas the ground echoes are attenuated. [A3709]

"Microwave reflection survey technique for determining depth and orientation of buried objects"

A method and antenna assembly for transmitting into the ground polarizeable radiation whereby buried objects, and particularly long thin objects such as pipes can be located, the position determined, and the pipe direction ascertained, by taking measurements from a signle point, without mechanical movement of the antenna, and thereby allowing for good suppression of spurious signals and a reduction in false indications. The method includes the steps of transmitting into the ground polarizeable radiation, receiving reflected signals, indicative of the objects, incident upon at least two co-located angularly disposed transducers and comparing the signals thus received, wherein the radiation is transmitted from a transducer source which is co-located but angularly disposed with respect to each receiver transducer. An antenna assembly suitable for use in the method of the invention includes a substantially planar arrangement of at least three, co-located, two-terminal antennas wherein the antennas are angularly disposed with respect to each other around a common point and each antenna is adapted to be capable of selectively transmitting polarizeable radiation into the ground and receiving reflected radiation from out of the ground. [A3710]

"System for interrogating a passive transponder carrying phase-encoded information"

A "passive interrogator label system" (PILS) comprises an interrogator for transmitting an interrogation signal, one or more "labels" or passive transponders which produce a reply signal containing coded information in response to the interrogation signal, and a receiver and decoder for receiving the reply signal and decoding the information contained in it. The frequency of the interrogation signal assumes a plurality of frequency values within a prescribed frequency range. The decoder includes a mixer (4 quadrant multiplexer) for mixing together the interrogation and reply signals (or signals derived therefrom) to produce a further signal containing frequencies which are the sum and difference of the interrogation and reply signals. A signal processor, responsive to this further signal produced by the mixer, detects at least some of the frequencies contained in this further signal and determines the informational code associted with the transponder. [A3711]

"Transponder device"

A transponder device receives a carrier signal from an interrogator unit. This carrier signal, of frequency F, is rectified by a rectifying circuit in order to generate operating power. Logic/timing circuits derive a clock signal and second carrier signal of frequency F/n from the received carrier signal. This clock signal reads a unique identifying data word from a programmable read only memory (PROM) . The data word is encoded and mixed with the carrier signal in a balanced modulator circuit. The output of the balanced modulator is transmitted to the interrogator unit, where it is decoded and used as an identifying signal. The identifying signal identifies the particular transponder device from which it originated. The rectifier and balanced modulator circuits are realized from the same diode elements. All electrical circuits of the transponder device are realized on the same monolithic semiconductor chip. In one embodiment, and antenna receiving/transmitting coil is also part of the chip, being placed around the periphery thereof. In alternative embodiments, various hybrid elements may be connected to the monolithic elements in order to realize additional functions, such as adjustable tuning of the receiving circuit, independent crystal frequency control, and battery-powered operation. [A3712]

"Radar system"

A radar system comprising an RF transmitter and receiver means for mounting in a moving carrier for transmitting

RF energy and receiving RF energy returns and a non-rotating modulating radar reflector which has a lens means for focusing incident impinging RF energy onto a spot opposite the incident side and a plurality of solid state modulating radar reflectors positioned at the spot locations for selectively reflecting the RF energy and dissipating the RF energy for providing RF energy returns modulated with a lens identification code and frequencies for determining true ground speed, range, glide slope, and azimuth position. The solid state modulating radar reflector including a microwave section having open back and front ends, a load resistive means at the back end, a PIN diode adjacent to the load resistive means and a modulating power source for modulating the PIN diode to provide at preselected intervals virtual shorts at the open end of the wave guide for reflecting modulated RF energy returns directly to the source of RF energy. [A3713]

"Ski speedometer"

A transducer is mounted on a ski and transmits ultrasonic waves toward the stationary medium over which the ski is moving. The same transducer or a separate transducer detects waves reflected from the stationary medium. A computer calculates the speed of the ski from the Doppler shift of the reflected waves and actuates a readout unit to indicate the speed to the skier. [A3714]

"Radar system with reduced distance error"

In a radar system comprising equipment for transmitting frequency modulated pulses and compressing the received signals in a filter for frequency-dependent weighting, the weighting is asymmetrical in a manner such that the leading sidelobes of the pulse compression signal are reduced and the lagging sidelobes are raised. The reduced leading sidelobes can easily be reduced below an amplitude threshold so that the main echo lobe within the pulse compression signal is reliably acquired for determining the closest target distance. The invention may advantageously be applied to ground tracking radars. [A3715]

"Alien radar suppression circuit"

Disclosed is an alien radio ranging transmitter rejection technique utilizing random PRF to eliminate the possibility of lock-on between two coherent R/T units in close proximity. If one, or both, are utilizing the random PRF technique taught herein, the alien signal is rejected utilizing standard noise suppression techniques. The random PRF is selected utilizing noise or angle data computed from the received return signal and is thereafter utilized to designate which one of a set number of PRF delays is utilized on a substantially random basis. [A3716]

"Method and apparatus for the graphic registration of moving vehicles"

Vehicles are measured and photographed from the direction in which they are travelling by a Doppler radar speed measuring device equipped with a camera. During a measuring stage after the vehicle enters the radar beam, a measured speed value is determined and when this exceeds a specific limit value, the camera is triggered. The Doppler signal for checking the measured speed value is then further evaluated over a verification distance. If the measured speed value is confirmed then it is printed on the photograph at the end of the verification distance, if it has not been confirmed, then a cancellation indicator is printed. The film is then advanced and the detection of the entry of another vehicle is awaited. As a result of this checking of the measured speed value, the measuring reliability when registering oncoming vehicles is substantially increased and overtaking in particular can be detected in the range of the radar beam. [A3717]

"Super resolution imaging system"

A super resolution imaging system employing coherent radiation comprises transmitting, receiving and processing means to provide complex amplitude image data. The image data is processed by a weight function generator to provide a weight function. The weight function has values at individual image pixels consisting of a background or clutter intensity term added to a pixel intensity dependent term. The latter term is non-zero for pixel intensities exceeding a threshold level well above background. A computer generates singular functions from the weight function and system impulse response, and employs the singular functions to decompose the image data and subsequent object reconstruction. This provides enhanced resolution compared to that available from the image data alone. An iteration controller employs the reconstructed object data to iterate resolution enhancement until no significant improvement is obtained. [A3718]

"Ground speed sensor"

An ultrasonic ground speed sensor has a vehicle-mounted transmitter and a receiver for receiving signals reflected from the transmitter to the receiver by terrain over which the vehicle travels. An attenuated and phase-shifted transmit frequency is superimposed upon an output of the receiver to cancel cross talk, thus providing a substantially pure reflected frequency. A phase-locked loop converts the reflected frequency to a voltage which represents the direction and speed of the vehicle. [A3719]

"Point clutter threshold determination for radar systems"

An adaptive detection threshold system for moving target detector and moving target indicator radar systems. The threshold system uses data from the echo input signal to reconstruct a threshold level closely resembling the output clutter residue in doppler filters due to point clutter sources. At least three azimuth data values are used, with the values being from adjacent coherent processing intervals and separated in azimuth a distance approximately equal to the beamwidth of the antenna system. The data at the same range from the three azimuths is combined to form an estimate of the residue at the output of a doppler filter, assuming that the echo is caused by point clutter. Compensation for radar instability and changes in scan rate or interpulse period is included. Data from conventional constant false alarm rate processing designed to control alarms from distributed interference, such as weather echoes, is also used to compensate the residue estimate. [A3720]

"Method and apparatus for detecting microbursts"

The invention provides a method and apparatus for detecting specialized meteorological conditions, in particular a microburst. The detector is localized so as to process radar return signals from regions in which aircraft are particularly vulnerable to microbursts. The detector includes a Doppler radar and an intelligent processor. Doppler radar returns are stored in an array wherein the contents of each cell identify the wind velocity parallel to propagation path. A pattern matching process identifies the existence of a microburst, maximum wind velocity associated with the microburst, and the location of the center. By tracking the microburst center as a function of time, the microburst velocity and direction can be determined, allowing prediction for microburst location in the future. Based on observed microburst lifetimes, the expected duration of the microburst can also be predicted. Although the apparatus of the invention can be configured as a stand alone or dedicated unit, it can also be configured as an add-on to an existing ASDE-3. [A3721]

"Device for eliminating low frequency noise from a transmission system, in particular 1/f noise in a homodyne radar receiver"

Device for eliminating the noise in 1/f from a Doppler radar comprising in the HF emitting system, a phase coder introducing, at frequency PRF/2 a phase shift of 0 and .pi. alternately, and in the receiving system, after the receiver, a decoder, or gain inverter progrmmable between -1 and +1, acting, in the same manner as the coder, upon the receiving signal and comprising a low-pass filter downstream from the decoder for eliminating the noise in 1/f, that appears at PRF/2, the device being applied to a ground surveying radar. [A3722]

"Selectable doppler filter for radar systems"

An arrangement for selecting between different doppler filter pairs having response characteristics optimized for ground clutter or moving rain clutter rejection. The selecting process detects the amplitude and mean doppler of the received radar echoes. The filter which is optimized for rain clutter rejection is normally used until clutter amplitude is detected above a predetermined value and the mean doppler is detected as being equal to or near zero. When such a detection is made, the filter optimized for ground clutter rejection is selected. Portions of the selecting device allow for the selection to be determined over several samples rather than switching the filters in each sample or coherent processing interval. Another portion of the circuitry changes the predetermined values which must be exceeded for a selection of the ground clutter filter, thereby preventing another filter change with only a small change in detected amplitude or mean doppler. [A3723]

"Method of controlling the mode of driving electric vehicles"

A method of controlling the mode of driving an electric vehicle so that the electric vehicle is accelerated at a maximum acceleration and is decelerated at a maximum deceleration. The mode of variation of the running speed of the electric vehicle is estimated on the basis of the variation of the running speed of the electric vehicle calculated from the revolving speeds of the axles of the electric vehicle detected by revolving speed detectors associated with the axles, respectively. The axles are controlled for minute idle rotation or minute slip on the basis of the estimated mode of variation of the running speed of the electric vehicle to produce a maximum effective adhesion between the wheels attached to the axles and the rail so that the acceleration of the electric vehicle at a maximum acceleration and the deceleration of the same at a maximum deceleration are achieved. The torque of the axle carrying the greatest axle load among the driving axles of the electric vehicle is reduced intermittently or continuously so that the wheel attached to this axle is brought into steady rolling contact with the rail to calculate the estimated mode of variation of the running speed on the basis of a time interval between two successive torque reducing operations by means of a microprocessor or the like. Thus, the mode of driving an electric vehicle can be accurately controlled to produce a maximum effective adhesion through calculation based on the revolving speed of the axle. [A3724]

"Coordinate measurement and radar device using image scanner"

A system for measuring angles, including a lens or antenna for focusing the radiation from an object scene onto an image sensor which is shifted by a clock, thereby producing the real time imaging of the object scene wherein each element of the object scene is detected as a pulse, representing the element angular displacement from the lens, at the output of the image sensor. A system for measuring angles of objects relative to the centerline of a lens or antenna. A goniometer for measuring the bearing of objects. A system for measuring the vector speed of objects. A velocity meter for measuring the speed of objects. A system for tracking objects. A system for motion compensation. A search, track or track-while-scan detection system. Without the lens or antenna, a system for recording and reproducing halograms. [A3725]

"Arrangement for measuring velocity with respect to a surface"

This arrangement comprises a fixed frequency emitter circuit (10) for directing a wave (12) to a surface (2) by means of a transmission antenna (11) , a receiver circuit (25) for receiving by means of at least one receiving antenna (23) the wave (12) returned by the surface, and a processing circuit (30) for processing the return wave and enabling production of an indication of the velocity. The processing circuit has two branches (50 and 54) , a direct branch for applying the received signal to one input of a multiplying member (52) , and a delaying branch for applying the received signal to the other input of the multiplying member after having produced a delay t.sub.0 relative to the direct branch. A frequency estimating element (60) receives the multiplying member output signal and a calculation member (62) produces the indication of the velocity from the estimating member output signal and of the distance "h". [A3726]

"Ship collision preventive aid apparatus"

The present application discloses a ship collision preventive aid apparatus in which a radar picture and a key picture are selected from all pictures displayed on a display means as transmitted through a touch panel, and the operator touches the surface of the touch panel, so that a program for an operation key name selected is executed. Predetermined collision preventive aid data required for collision avoidance are then displayed on a display screen. With operation simplified, appropriate information concerning collision avoidance may be supplied and the entire construction is simplified. [A3727]

"Method and system for detecting an object with a radio wave"

Method and apparatus for detecting an object by using a radio wave which is radiated by an antenna toward the object to be detected. An echo wave of the radio wave reflected from the object is received by the antenna. On the basis of phase difference between the transmitted waveform and the received waveform, material of the object is discriminatively identified. The object is displayed as an image on a display unit. [A3728]

"Radar ranging system"

A system for determining the range R of a stationary emitter on the ground from an airborne bistatic radar as a function of velocity V, direction .beta., antenna spacing d, wavelength .lambda. and rate of change of phase with respect to time .theta. is discussed herein: ##EQU1## [A3729]

"Systems for determining distances to and locations of features on a golf course"

A golfer wishing to know the distance to a specified feature on a golf course, operates a portable interrogation unit, to enter a request for the distance to the location of the feature. Transmitters located to define a triangle encompassing a substantial portion of the course transmit ranging signals, which are received by the portable interrogation unit. The portable interrogation unit includes a memory which stores the locations of the transmitters and the locations of predetermined features on the course and a CPU which processes the ranging signals received from the transmitters to determine the location of the portable interrogation unit and further to determine the distance from the portable unit to the specified feature. The portable interrogation unit then displays the determined distance. To survey the locations of the various predetermined features on the course, a portable survey unit is substituted for the portable interrogation unit. Feature identification data is entered and a CPU in the portable survey unit determines the location of the unit by processing the ranging signals and causes such location to be stored in an area of a memory therein that is addressed by the entered feature identification data. The stored feature locations then are transferred to the respective memories of a plurality of portable interrogation units. [A3730]

"System and method for controlling a vehicle speed of an automotive vehicle"

A system and method for controlling a vehicle speed to follow a preceding vehicle moving on the same traffic lane of a road as the vehicle. The system comprises: means for transmitting electromagnetic waves toward a vehicle movement direction, receiving the reflected waves from a reflecting object, measuring a distance to the reflecting object on the basis of a propagation delay time on the transmitted and reflected wave, and outputting respective Doppler signals derived from a relative movement of the reflecting object to the vehicle, means for calculating a change rate of the phase difference between the Doppler signals with respect to the measured distance, means for determining whether the reflecting object is the preceding vehicle on the basis of a magnitude of the differentiated phase difference with respect to a reference value associated with the distance and set according a radius of curvature of the traffic lane on which the vehicle moves, and means for controlling the vehicle speed so as to follow the preceding vehicle at a safe intervehicle distance on the basis of the vehicle speed and measured distance. [A3731]

"System for the visualization of the movements of marine vessels by television display"

Arrangement for visualizing the movements of marine vessels by television display. The arrangement comprises a position determination unit which is arranged to continuously provide position determinations in the form of coordinate values in a certain coordinate system for a number of vessels together with a data processing equipment which is arranged to feed the coordinate values with predetermined control signals each in the form of a television signal arranged to bring about a stylized image on a television screen of the respective floating units. The control signals are integrated in such a way with the respective coordinate values that a number of images are produced on a television screen of the vessel in positions which correspond to the mutual position between them in the system of coordinates. These images are moved on the television screen in accordance with the change in the continuously output coordinate values. [A3732]

"Systems for determining distances to and locations of features on a golf course"

A golfer wishing to know the distance to a specified feature on a golf course, such as the pin on the next green, operates a portable interrogation unit, which transmits an interrogation signal including a request for the distance to the location of the specified feature. Three remote stations located to define a triangle encompassing a substantial portion of the course receive the interrogation signal and communicate interrogation information signals to a central station. The interrogation information signals include the interrogation signal data, remote station identification data, and pertaining to the location of the source of the interrogation signal relative to the remote station. The central station includes a memory which stores the locations of various predetermined features on the course and a CPU which processes the interrogation information signals from the remote stations to determine the location of the portable interrogation unit and further processes the determined unit locations with the location of the specified feature to determine the distance from the portable unit to the specified feature. The central station transmits a response signal to the portable unit indicating the determined distance, which the portable unit then displays. To survey the locations of the various predetermined features on the course, a portable survey unit is substituted for the portable interrogation unit and transmits a survey signal including feature identification data. The CPU determines the location of the portable survey unit and causes such location to be stored in an area of the memory addressed by the feature identification data in the survey signal. [A3733]

"Subsurface inspection radar"

A radar system for subsurface inspection comprising a short pulse transmitter, an antenna for radiating signals to and receiving external reflections from the surface and from below the surface being inspected, a receiver connected to the antenna for generating an output signal in response to the external reflections, and a clutter cancellation circuit for eliminating internal reflections developed in the system to prevent interference by such internal reflections with the desired external reflections to enhance the system detection capability and reliability of evaluation of such external reflections. Clutter cancellation is accomplished by storing the internally generated clutter and subsequently subtracting it from each incoming radar range sweep consisting of surface and subsurface signals plus unwanted clutter. An internal signal recognition circuit rejects all return signals except that generated internally to the radar by the antenna structure, and this internal antenna echo is used as an internal reference signal whereby the radar system is relatively insensitive to wide variations in external reflection characteristics caused by wide variations in the nature of materials present in the surface being inspected. This in turn provides for a reliable control of the receiver sampling process which is indpendent of external signals and of their amplitude variations. A circuit for compensating for thermal drift permits long term cancellation of the internally generated clutter. The drift compensation circuit, the internal signal recognition circuit and the receiver provide a closed loop stabilization to allow the internal clutter to remain correlated on a range sweep by range sweep basis. [A3734]

"Surface acoustic wave pipe identification system"

A drill pipe identification system automatically provides an identification number for each drill pipe as the drill pipe is being lowered into or withdrawn from the well. The system has a SAW identification device which is mounted in a cylindrical cavity which is formed within a tool joint of each section of drill pipe. The cavity has an aperture leading to the exterior of the tool joint to allow radio frequency signals to be received and reradiated. The SAW device receives signals from a transmitter and receiver, modulates the signals and reradiates them in a manner that corresponds to an encoded number in the SAW device. [A3735]

"Velocity discrimination radar"

A radar method and apparatus which utilizes a first frequency signal modued by a first modulating signal and a second frequency signal modulated by a second modulating signal, the first and second frequencies being different and the first and second modulating waveforms having different periods of repetition. The radar receiver separates the return radar signal into the component due to the first frequency signal and the component due to the second frequency signal. Both components are then heterodyned with their respective frequency signals. Each modulating waveform is subjected to a plurality of delays and each component is subsequently correlated with each of its respective delayed modulating waveforms. A target is recognized when the correlated first frequency component exceeds a predetermined threshold and simultaneously the correlated second frequency component exceeds a predetermined threshold. [A3736]

"Narrow range gate baseband receiver"

A baseband receiver with a range gate interval in the order of nanoseconds. A tunnel diode, set to the low level state, is coupled across the output terminals of a bridge that is balanced in the absence of a received signal, during the range gate interval. Signals received by an antenna are coupled to a tunnel diode in an arm of the bridge causing it to change from its low level state to its high level state thereby unbalancing the bridge and establishing a voltage at the output terminals of the bridge that fires the tunnel diode coupled thereacross. [A3737]

"Automatic range finder and remote controller braking system"

An automatic range finder and remote controlled braking system is provided. When mounted to a vehicle, this system senses the distance between the equipped vehicle and any other vehicle or object in front of it and sets off a warning alarm when the separating distance is less than some preset value. As the distance continues to close, when the distance closes to some preset braking distance, a braking alarm is activated, and controlled breaking, proportional to the rate of change of distance with respect to time commences. The actual distance is always displayed. Additional braking is accomplished by applying increased breaking force to the conventional brake pedal while a panic button can be used to disable the automatic braking entirely. The beamwidth of the corner reflector type antenna is controlled for calibration purposes by adjusting the lateral placement of the radiating dipole using a motor and worm drive system. [A3738]

"Vehicle speedometer"

A vehicle speedometer is disclosed which accurately measures vehicle velocity despite significant vehicle vibration, which causes variation of the angle of incidence of the measuring wave. Two transceivers are mounted on the vehicle, along with means to determine a frequency difference and an angle variation, both being used in an accurate velocity determination. [A3739]

"Multiple range interval clutter cancellation circuit"

A multiple range interval clutter cancellation circuit for MTI radars is disclosed, for assuring cancellation of narrow band clutter in the second or further range interval, while preserving wideband cancellation in the nearer range intervals and economizing on the number of fill pulses. The circuit includes two clutter cancellers. One canceller has a relatively narrow band clutter rejection bandwidth, and effectively a higher number of fill pulses in relation to the clutter rejection bandwidth and effective number of fill pulses for the second canceller. The outputs of the two cancellers are subjected to an and gate function, such that only targets which pass through the clutter rejection bandwidth of both cancellers are reported as a target. The circuit obtains the elimination of returns from ambiguous range interval clutter with less transmitted energy and time than conventional canceller circuits. [A3740]

"Accurate location sonar and radar"

A sonar or radar permits primary distributed scatterers that are close to the sonar or radar relative to the array dimension to be rapidly and accurately located and pertinent characteristics to be estimated, such as Doppler and complex scattering strength. The region viewed is partitioned in annuli instead of in angular pie shaped slices as is normally the case for conventional sonar. This avoids the difficulty with conventional sonar or radar of distinguishing whether a scatterer is in a side lobe or the main beam an dis preferable to conventional sonars or radars in the important case of approaching multiple scatterers, e.g. robotic vehicle sensors or torpedo terminal homing on a target, because near regions may be examined in all directions prior to further regions. Computational speed is achieved by utilizing precomputation and leaving only part of the computation to be performed in real time. [A3741]

"Methods of and circuits for suppressing doppler radar clutter"

Clutter suppressors and methods of clutter suppression for radars which employ the doppler effect for enhancing signals due to moving targets relative to signals due to clutter caused by land, sea or rain. Specifically, the disclosure concerns suppressors and methods of clutter suppression for cw doppler, pulse doppler and MTI (moving target indication) radars. The suppressors reduce the occurrence of radar output due to clutter by permitting and prohibiting radar output on the basis of the strength of signals that contain doppler frequency components of the radar echo. [A3742]

"Survivable ground base sensor"

The survivable ground base sensor is the basic element of a land-based distributed radar that consists of 60 or more individual subarrays, which are located in either a straight line or on the perimeter of a 200 nmi diameter circle in the north central U.S. At least 10 nmi separation is provided between individual subarrays. Each subarray is self-contained with emergency power and is operated unattended. There is no need for any interconnection between subarrays so that the survivability is improved, and there is no limit to the number of subarrays used except that imposed by cost and the desire for greater survivability. Since the spacing between subarrays is 10 nmi, a direct hit on one subarray will not damage an adjacent one so that a separate re-entry vehicles must be targeted to each subarray. [A3743]

"Moving target indicator using a surface acoustic wave device"

A surface acoustic wave (SAW) device in a pseudo-coherent moving target indicator uses a common input transducer to delay both reference and signal inputs to a mixer by varying amounts. The mixer produces a Doppler signal which is processed within a single range cell. The SAW device may contain additional delay paths which drive other range cells. Power splitting and amplification sections of the moving target indicator are minimized through use of the SAW device. [A3744]

"Pseudo-raster weather display apparatus"

A display system employing a stigmator coil disposed on the neck of a cathode-ray tube to widen an electron beam primarily in a direction normal to the electron beam scanning direction to produce a continuous shading effect for displaying weather information. A bidirectional pseudo-raster scan writing pattern is used to obtain maximum fill effect between scan lines and illumination uniformity with far fewer raster lines than in a conventional raster display. [A3745]

"Delay device and the use thereof in the decoding device of distance measuring equipment"

A device for delaying an electric signal comprising means for acquiring the signal, sampling it at a frequency f.sub.e and delivering it in parallel in the form of binary words of M bits, at a frequency f.sub.m such that f.sub.m = (f.sub.e /M) , means for storing said binary words for a given period of time and operating at the frequency f.sub.m and means for restoring at frequency f.sub.e the signal from the binary words. [A3746]

"Doppler-inertial data loop for navigation system"

Accurate vehicle pitch and roll can be computed from a corresponding signal loop which receives inertial data input contaminated by the effects of gravity on a vehicle. Data from Doppler radar is compared to the inertial data and an error signal dependent on pitch or roll angle is substracted from the input inertial data resulting in the generation of accurate navigational parameters. [A3747]

"Out-of-range personnel monitor and alarm"

An out-of-range monitor and alarm system that may be used by a convalescent home or the like to alert an attendant in the home that a supervised person has walked beyond a predetermined prescribed distance. The system includes a base unit that transmits a first signal to a receiver in a mobile unit carried by the supervised person. The receiver includes a threshold circuit that is adjustable to correspond to the prescribed distance and produces a threshold output signal whenever the first signal detected by the receiver drops below the threshold level. In response to the threshold output signal, a transmitter in the mobile unit produces a second signal to a receiver in the base unit, which in turn sounds an alarm indicating that the mobile unit has lost adequate signal strength, as determined by the threshold adjustment, by exceeding the range prescribed for the supervised person. The first and second signals may have equal frequencies if the mobile unit produces an output signal having an identification code. The base unit has decoder for identifying the responsible mobile unit. [A3748]

"Detection of vibrating target signatures"

This radar system can be used as an independent entity or as an addition to n operating radar system for acquiring additional data from a radar target's returned signal that is not currently being utilized. The system is to separate the amplitude modulation and frequency modulation sidebands created by the target's surface motion or vibration into independently useable entities. The system measures near carrier AM and FM noises, together with techniques for integrating these elements into a working radar system. [A3749]

"Instrusion detection system"

An intrusion detection system that comprises a transmission line for RF energy, a transmitter coupled to one end of the transmission line to supply pulses of RF energy into the line, and a range gated doppler receiver for receiving RF energy from the other end of the transmission line. The receiver includes means for producing a detection signal indicating the presence of doppler components in a range gated portion of the RF energy received from the transmission line. [A3750]

"Rapid inventory data acquistion system"

A computerized transceiver repeatedly sweeps through a set of transmit/receive frequencies to interrogate collectively a plurality of groups of items in a stocking area. Items in each group are tagged with a printed circuit transponder tuned to frequencies uniquely assigned to each group. Data turned is stored and combined mathematically by the computer to arrive at the total number of items in each group. The system is particularly adapted for taking inventory of a large number of retail shelf goods using a mobile transceiver. [A3751]

"Golf playing field with ball detecting radar units"

A golf playing arrangement which includes a fairway, a tee area at one end of the fairway, a plurality of radar ground surveillance units located on the fairway at successively greater distance from the tee area, a central processing unit and a video display terminal and putting green adjacent the tee area. Each of the ground surveillance units detects golf balls moving on the ground in a predetermined circular area containing the unit. The central processing unit calculates and the computer terminal visually displays the distance of the unit furthest from the tee area which detects a golf ball moving therethrough, and the sum of a succession of such distances. This arrangement permits a golfer to play a golf-like game without the need to follow a ball from tee to green. [A3752]

"System and method for automatically controlling vehicle speed"

A system and method for detecting a distance from a vehicle to an obstacle in front of the vehicle and controlling the vehicle according to changes in the distance thereof holds the vehicle speed constant upon recognition of the fact that the detected obstacle is a plurality of regularly spaced, stationary objects disposed along a side of a curved road and otherwise the vehicle speed is controlled on the basis of the distance between the vehicle and detected obstacles such as other vehicles moving in front of the vehicle or obstacles resting on the road as the vehicle moves through a curve. [A3753]

"Rear monitor system triggered by occupant leaving the vehicle"

A rear monitor system for an automotive vehicle comprises a sensor secured to a vehicle door located on one side of the vehicle and adapted to be operated by a vehicle occupant when leaving the vehicle, the sensor generating a signal indicating that the occupant is going to leave the vehicle. A control unit is responsive to the signal from the sensor for transmitting radiant energy in a rearward direction to detect a reflection from an object approaching the vehicle from behind at a speed higher than a predetermined value. Further provided is a safety device which is responsive to the detected reflection for preventing the vehicle occupant from opening the door. [A3754]

"Millimeter wave length guidance system"

A high frequency target seeking device, using a stabilized reflector antenna, performs range search and tracking functions and target angle search and tracking functions. A technique is provided for target range discrimination using several narrow band i.f. filters, also thereby improving signal-to-clutter ratio and signal-to-receiver noise ratio. Target search is accomplished with simultaneous range and antenna azimuth scanning, with the range bins and the antenna beam swept across the target. A multiplexer selects the range bin having signals indicative of the target. Target range tracking is accomplished by the multiplexer additionally automatically selecting range bins adjacent to the target's range bin and comparing their output signals. Antenna stabilization is accomplished utilizing signals from vehicle pitch, roll, and yaw rate sensors, and antenna elevation and azimuth rate and angle sensors. These signals are processed in the antenna control circuit according to predetermined relationships to provide the desired antenna stabilization. [A3755]

"Doppler radar velocity measurement horn"

Doppler radar apparatus for use in a velocity measuring system for farm tractors and the like. The apparatus includes a dual mode conical horn having a flare angle substantially in excess of 12.5.degree., and a dielectric lens formed of a glass filled polymer. The doppler output signal provided by the RF transceiver associated with the dual mode horn is high pass filtered to remove low frequency signals therefrom. The horn is mounted in such a way that it is isolated from mechanical vibrations which would induce doppler signal frequencies in excess of the cutoff frequency of the high pass filter. Moreover, the horn assembly (which is aluminum) and a steel housing assembly are coupled together in such a way that thermal expansion and contraction will not loosen the friction fit between the two assemblies. The two assemblies are held together by a single, large diameter annular locking ring. [A3756]

"Doppler distrometer for the measurement of hydrometer size distribution"

An apparatus and method are disclosed which employ the Doppler principle to measure the terminal velocity and, hence, the size distribution of hydrometeors such as raindrops and hailstones. The apparatus of the present invention employs a ground-based, upwardly directed, low power, 10.525 GHz homodyne continuous wave radar module to transmit microwave signals to falling hydrometeors within the size range of 0.5 mm through 4.0 cm, to record the frequency distribution and power spectrum of the reflected signals, and to process these data with "terminal velocity"-to-"hydrometeor diameter" calibration data to generate information on the hydrometeor size distribution in the precipitation under observation. The disclosed method permits a user of the apparatus to select the Doppler velocity threshold above which data are recorded for processing with a Fast Fourier Transform technique to determine hydrometer velocity values. [A3757]

"Passive transponder for locating avalanche victims"

This transponder includes a dielectric support, an antenna and a covering layer. The central portion of the antenna forms a self induction loop which, together with the junction capacity of a non-linear component serving to close the loop, provides a circuit resonating at the frequency at which the transponder receives its energy. The antenna radiates energy at double this frequency which energy may be detected by a receiver. [A3758]

"Radar system"

A radar system comprises means for forming a transmission pulse signal as m sets of n pulses, the individual sets having respective PRPs Ti (i=1, 2, . . ., m) moving target detection means, and angle measurement means utilizing beam-to-beam amplitude comparison and interpolation for a given moving target. Beam-to-beam amplitude comparison and interpolation is carried out at least twice for one target by making use of a pair of video signals with the same PRP processed by the moving target detection means. The angle measurement is achieved through a predetermined correlation processing over thus obtained interpolated angle values for a target. [A3759]

"Efficient adaptive filter bank"

An N-point Fourier transform circuit for a moving target indicator system including a delay circuit with 2N-2 delays, N frequency filters, a processor for forming a main signal and N-1 auxiliary signals via time sample manipulation, a Gram-Schmidt adaptive canceller circuit for decorrelating the N-1 auxiliary signals from the main signal, and a first and second commutating switches. The first switch tracks a given set of N time samples through the delay circuit. The second switch switches the given set of N time samples through a different successive frequency filters of the N frequency filters every transmission. The first switch tracks in synchronism with the second switch and switches to obtain a new given set of N time samples every NT seconds. [A3760]

"Radar detection of hazardous small scale weather disturbances"

The detection and warning of microbursts, low level wind shear, and other weather disturbances, which are hazardous to aircraft operations and to the public at large, are accomplished with either an airport surveillance radar (ASR) or a multi-beam Doppler radar. ASR Doppler systems normally operate to receive one of two relatively large vertical fan beams having different elevation angles but which overlap one another so that they have equal gains at an elevation angle, called the null, at a relatively low angle, for example 5.degree.. Below this null, the low beam antenna gain exceeds that of the high beam, and conversely above it. Accordingly, by subtracting the high beam Doppler spectrum from that on the low beam, a Difference Doppler Spectrum (DDS) is produced which is positive below the null and negative above. The velocity bounds of the positive portion of the DDS provide the wind speed components at the null and at heights near the surface. These wind speed components are then utilized to measure and map radial and horizontal shear, the boundaries of the disturbance and other signatures such as vertical shear and turbulence and the rate of change of all the parameters, thereby permitting the detection of the location and track of the disturbance. A multi-beam Doppler radar can be utilized to perform similar functions of measuring the mean Doppler velocity, Doppler spectral breadth, and reflectivity simultaneously at all elevations. Both systems provide effective enhancements in signal to clutter ratio through pattern recognition and motion detection. [A3761]

"Phased antenna array for wind profiling applications"

A diagonal phased antenna array for use as a wind profiler by means of Doer shift measurements comprises a plurality of Yagi-Uda antennas which are oriented in a predetermined direction such that Yagi-Uda antennas have a polarization 45.degree. offset from the principal planes of operation of the antenna array resulting in similar radiation patterns subject to a geometric taper in the array aperture with respect to the principal planes. [A3762]

"Bistatic coherent radar receiving system"

A coherent-on-receive MTI radar receiver system for use with cooperative or non-cooperative radar transmitters of either the coherent or noncoherent, simple magnatron type and scanning antennas. The receiver includes coherent digital signal processing with provision for normalizing or compensating phase variations in the transmitter carrier pulses. [A3763]

"Method and apparatus for microwave determination of liquid rate-of-rise using Doppler detection"

A method and apparatus provide for the determination of the rate-of-rise of the level of a liquid, such as molten metal in a mold, in a reliable, accurate, and flexible manner. Molten metal passes from a container through an adjustable valve in an orifice to a mold. A microwave generator is connected to a microwave antenna located above the mold for transmitting microwaves to the surface of the molten metal in the mold. A mixer/detector is operatively connected to the antenna, and a computer is operatively connected to the mixer/detector. The computer processes the mixed signal received from the mixer/detector after it is converted to a digital signal. This digital signal is responsive to the Doppler signal caused by change in the level of the metal in the mold. The rate-of-rise of the surface of the molten metal is calculated in response to the digital signal, and is displayed on a monitor. The slide gate is controlled to adjust the amount of molten metal flowing from the container to the mold to achieve a desired rate-of-rise. The computer uses various techniques, such as calculating rolling averages and optimizing maxima-to-maxima and minima-to-minima time interval calculations, to improve reliability in the presence of noise, spurious multiple reflections, and disturbances in the molten metal surface. [A3764]

"Signal receptor-reradiator and surveillance tag using the same"

An improved receptor-reradiator, for use in a surveillance system employing a carrier frequency of UHF or higher in combination with a low frequency electrostatic field signal to be modulated on the carrier signal by the reradiator, is provided by an antenna frame wherein the metallic foil of which it is made is divided into three parts. The first part is U-shape of substantially one width and joins to a central portion of substantially reduced width which is predominantly inductive at the carrier frequency. A semiconductor diode, preferably a Schottky barrier diode or PIN switching diode, is connected in said central portion in series therewith. The opposite end of the central portion joins to an enlarged rectangular portion. At the low frequency the component has effectively two capacitive arms, one on each side of the diode, of different surface area to ensure bias signal for the diode. However, at the carrier frequency, the central portion has a high inductive reactance which, in conjunction with the inductive reactance of the U-shape portion, tunes to resonance the total capacitance of the component including that of the diode. The parts are proportioned such that the diode sees at the carrier frequency an inductance on one side and a capacitance on the other side. [A3765]

"Medical diagnostic microwave scanning apparatus"

Microwave apparatus for diagnosis of cancer of the breast includes a microwave transmitter and a microwave antenna for directing a microwave signal to the breast under examination, and a microwave receiver having amplitude and phase shift detectors for receiving of reflected microwave signals. A processor is connected to the receiver for processing the amplitude and phase information to detect and locate cancer in the breast. A matching plate having a dielectric constant substantially the same as normal breast tissue is located between and in engagement with the breast and antenna. The antenna engages and sweeps over the plane surface of the matching plate to eliminate any air gap in the transmission path. A display unit is connected to the processor to create a microwave image of cancer growth, if any. [A3766]

"Security eyes for prevention of car accidents"

This invention allows for the use of safety apparatus at the front and rear of the automobile, which serve as an addditional pair of "eyes" for the driver. The apparatus comprises a security system for the prevention of automobile collisions. The apparatus at the front of the automobile is connected to the front wheel system or to the steering mechanism by an appropriate rotary device which revolves so that the beams or waves do not encounter vehicles in oncoming lanes going in the opposite direction. The electronic safety apparatus emits beams or waves whose length is automatically regulated to correspond to weather conditions and to the speed of the vehicle so as to ensure safe braking distance. [A3767]

"Adaptive MTD digital processor for surveillance radar"

A digital MTD processor interposed between a coherent video detector and a signal extractor of a surveillance radar comprises a plurality of Doppler filters connected in parallel to the video-detector output, including a zero filter, working into respective modulus extractors connected by way of respective threshold circuits to a common OR gate. Each threshold circuit includes a fixed-threshold comparator and an adaptive-threshold comparator with inputs connected in parallel to the output of the associated modulus extractor, either of these comparators being connectable to the OR gate via a switch controlled with the aid of a rain-clutter map so that the adaptive threshold is used only during exploration of regions with heavy rain. A ground-clutter map, which can be updated on the basis of level measurements performed on the output of the zero filter, controls the selective loading of each Doppler filter with one of three preselected sets of weights depending on the intensity of the ground clutter in the region being explored. Where ground clutter is heavy, the threshold circuit of the zero filter may be cut off from the OR gate. Both the fixed and the adaptive thresholds can be incremented in response to a command from the signal extractor generated upon the occurrence of an excessive number of false alarms. [A3768]

"Vehicle mounted Doppler radar system"

A Doppler radar system for mounting on a vehicle to sense the speed of movement of the vehicle and to provide an output proportional to the speed of the vehicle. The output is substantially free from errors due to the vibration and of the vehicle. A Janus configuration is also provided which also eliminates errors due to the angle of tilt of the vehicle. [A3769]

"Vehicle identification system using radar and acoustic information"

A vehicle identification system includes a doppler radar producing a doppler frequency signal having noise components and having a value f.sub.D corresponding to the speed of the vehicle to be identified and a doppler frequency having a value X.multidot.f.sub.D corresponding to the speed of the vehicle propelling means, each doppler frequency being modulated by signals corresponding to the movements made by individual elements of the vehicle propelling means. The doppler signal is passed through first and second adjustable filters adjusted to pass f.sub.D and x.multidot.f.sub.D respectively and sidebands relating to the modulating signal. Amplitude detectors coupled to the outputs of the two filters remove the doppler frequencies leaving the modulating signals relating to the movement of the vehicle elements. The modulating signals are applied to an adjustable commutating filter adjusted to frequency by a signal corresponding to frequency f.sub.D. The output signal from the commutating filter represents sounds made by the vehicle individual elements by which one can identify the vehicle as to type. [A3770]

"Method for sea surface high frequency radar cross-section estimation using Dopler spectral properties"

A method for estimating the high frequency radar cross-section of the sea surface. A Doppler spectrum of the sea surface is obtained by correlating returns from high frequency radar signals. Approach and recede Bragg spectral lines and a zero Doppler frequency continuum level are identified in the Doppler spectrum. The amplitude ratio .rho. between the Bragg spectral lines and an amplitude ratio .zeta..sub.M between the maximum amplitude Bragg spectral line and the zero Doppler frequency continuum are measured from the Doppler spectrum. The radar cross-section is then determined from the ratios .rho. and .zeta..sub.M. In a further method embodiment, the estimated radar cross-section is used to estimate the radar cross-sections of targets appearing in the Doppler spectrum. [A3771]

"Radar velocity sensor"

A tracking, variable Q bandpass filtering method and apparatus are provided for processing an IF signal from a radar transceiver or the like. The method comprises developing a digital period signal corresponding to the period of each of selected cycles of the IF signal, subjecting the digital period signal to low pass filtering, and controlling the effective corner frequency of the low pass filtering in accordance with the amount of variation in the digital period signal from one selected cycle to a successive selected cycle for producing a filtered signal which substantially follows the digital period signal, thereby substantially simultaneously tracking and filtering the IF signal. The apparatus comprises apparatus for carrying out the foregoing method. Preferably, the apparatus also includes an output switching control for selectively delivering or withholding the filtered signal from an output utilization device. This control is responsive to a predetermined control signal for withholding the filtered signal from the output utilization device. Preferably, the apparatus also includes a switchable power supply for the radar transceiver and a control circuit responsive to a predetermined control signal for switching the switchable power supply means to an inactive condition, thereby removing power from the radar transceiver. [A3772]

"Suppressor of second-time-around clutter echoes for MTI pulse radar provided with power oscillator"

A device for suppressing second-time-around echoes from far-out clutter in an MTI pulse radar lies in shunt with a digital signal processor connected to the receiver output of the radar whose transmitter includes a power oscillator maintaining phase coherence only for the duration of an outgoing pulse. In order to minimize the occurrence of blind speeds, the oscillator is triggered for different pulse-repetition frequencies of predetermined values in alternate scanning intervals each lasting for an antenna rotation by half a beamwidth. Echoes from a group of radar pulses emitted in one interval are accumulated and then compared in magnitude with accumulated echoes from another such group emitted in an adjoining interval. If these magnitudes--relatively adjusted to compensate for the different numbers of pulses per group--are substantially equal over a sequence of antenna revolutions, they are classified as due to second-time-around clutter echoes and the output signal of the processor is eliminated for the corresponding scanning intervals. [A3773]

"Ground clutter suppression technique"

A ground clutter suppression technique is disclosed utilizing two parallel return signal processing paths, both utilizing linear-to-logarithmic conversion capability and one having a signal delay capability for one pulse repetition. The outputs are subtracted and are subsequently compared with a factor related to the root-mean-square (rms) of two deviation inputs, one input functionally related to apparatus limitations and one deviation input functionally related to antenna position (step between samples) for each signal received. The Doppler frequency standard deviation inputs are then summed rms and used to select an amplitude standard deviation which is compared with the amplitude difference between successive return signals. Thereafter, the logic decision output is operated on utilizing a digital filter to essentially eliminate ground clutter or small variance (PRF to PRf) return signals from the display. [A3774]

"Inter-vehicle distance control system for vehicles"

An inter-vehicle distance control system for a vehicle wherein the distance between the vehicle and a preceding object and a relative velocity therebetween are detected by a detection system such as a radar system, and when this distance has become shorter than a predetermined value, a reaction force is imparted to a throttling operation member such as a throttling pedal. The vehicle operator is effectively advised of this fact. [A3775]

"Positioning jig for edgewise bracket"

A positioning jig for an edgewise bracket having a lingually disposed vertical slot or opening to position the bracket on a tooth when bonding the bracket to the tooth. The jig is disposable and mounted on the bracket to be handled as a unit during the bonding procedure and thereafter removable from the bracket once the bonding material has cured. Indicia is provided on the jig and the bracket to identify the tooth on which the bracket is to be mounted and the spacing of the archwire slot from the occlusal or incisal edge of the tooth. [A3776]

"Surface acoustic wave passive transponder having acoustic wave reflectors"

A passive transponder for use in an interrogation/transponder system comprises a substrate having a substrate surface defining a path of travel for surface acoustic waves, at least one transducer element arranged on the surface for converting between electrical energy and surface acoustic wave energy which propagates along the path of travel, and a circuit, connected to the transducer element (s) , for supplying interrogating signals to the transducer element (s) and for receiving reply signals therefrom. In order to minimize insertion losses in the substrate, acoustic wave reflectors are provided to reflect the surface acoustic waves back towards the transducer element (s) . [A3777]

"Surface acoustic wave passive transponder having amplitude and phase-modifying surface pads"

A passive transponder for use in an interrogation/transponder system comprises a substrate having a substrate surface defining a path of travel for surface acoustic waves, a launch transducer element arranged on the surface for converting interrogating signals into surface acoustic waves which propagate along the path of travel, a plurality of tap transducer elements arranged on the surface at spaced intervals along the path of travel for converting surface acoustic waves into respective output signals, and a circuit, connected to the tap transducer elements, for combining the output signals of these transducer elements to form reply signals. In order to control the delay time from transducer element to transducer element, one or more "delay pads" are provided on the substrate surface between these transducer elements. [A3778]

"Collision avoidance apparatus"

Apparatus for assessing maneuvers of a first vehicle (6) so fitted relative to other vehicles (58, 68, 71-74) comprises sensing means for providing signals representative of the positions and velocities of the other vehicles relative to the first vehicle (6) , computing means responsive to said signals for computing symbology respectively associated with the other vehicles, and display means coupled to the computing means for displaying the symbology relative to the position of the first vehicle, thereby providing indicia to assess maneuvers of the first vehicle which will avoid collision with the other vehicles, and which will ensure that the first vehicle will not pass closer to the other vehicles than a predetermined distance for all relative positions and velocities thereof, the symbology associated with each of the other vehicles in all encounter circumstances comprises at least a final escape point (FEP) (40) which, if reached by the first vehicle (6) , will allow the first vehicle still to avoid the associated other vehicle by said predetermined distance, and two vectors (49, 50) , originating at the FEP, for the first vehicle, which will take the latter clear ahead or clear astern of said other vehicle by said predetermined distance. [A3779]

"Apparatus for compensating non-linearities in frequency-modulated signal"

A "passive interrogator label system" (PILS) comprises an interrogator for transmitting an interrogation signal, one or more "labels" or passive transponders which produce a reply signal containing coded information in response to the interrogation signal, and a receiver and decoder for receiving the reply signal and decoding the information contained in it. The frequency of the interrogation signal assumes a plurality of frequency values within a prescribed frequency range. The decoder includes a mixer (four quadrant multiplier) for mixing together the interrogation and reply signals (or signals derived therefrom) to produce a mixed signal containing frequencies which are the sum and difference of the frequencies of the interrogation and reply signals. A signal processor, responsive to this mixed signal, detects the amplitude and phase of at least some of the frequencies contained in the mixed signal and thereby determines the informational code associated with the transponder. Non-linearity in the transmitted frequency values is compensated by a circuit which produces a sampling signal when the frequency has changed by a prescribed amount .DELTA.f. This sampling signal triggers an analog-to-digital converter which converts the mixed signal (or a signal derived therefrom) into a digital value upon receipt of each sampling signal. [A3780]

"System and method for automatically controlling vehicle speed"

A system and method for automatically controlling the speed of an automotive vehicle holds the vehicle speed constantly at a set vehicle speed when there are no other vehicles in front of the vehicle and controls the vehicle speed so as to follow another vehicle moving in front of the vehicle according to the distance between the two vehicles. The system disables both of the above-described functions when the vehicle speed is outside of a predetermined speed range around a set vehicle speed after the leading vehicle is no longer in front of the vehicle or a predetermined interval of time after the other vehicle has disappeared from a front detection area. [A3781]

"System for automatically controlling vehicle speed"

In a system and method for automatically controlling a vehicle's speed, the rate of change of the inter-vehicle distance per predetermined unit of time is calculated from the detected inter-vehicle distance between the controlled vehicle and a preceding vehicle, a basic safe inter-vehicle distance is corrected according to the calculated rate of change of the inter-vehicle distance per predetermined time, and the vehicle speed is controlled according to the difference between the corrected safe inter-vehicle distance and the detected inter-vehicle distance. [A3782]

"Method and apparatus for measuring water level in a well"

A method for measuring the water level in a well including the steps of radiating an electromagnetic wave to a gap between a boring drill rod and a casing pipe by using a transmitting antenna, receiving the electromagnetic wave reflected by a surface of the water level in the casing pipe by using a receiving antenna, then measuring a distance between the surface of the water level and the receiving antenna based on the going and returning time of the electromagnetic wave. [A3783]

"Surface acoustic wave passive transponder having parallel acoustic wave paths"

A passive transponder for use in an interrogation/transponder system comprises a substrate having a substrate surface defining a path of travel for surface acoustic waves, a launch transducer element arranged on the surface for converting interrogating signals into surface acoustic waves which propagate along the path of travel, a plurality of tap transducer elements arranged on the surface at spaced intervals along the path of travel for converting surface acoustic waves into respective output signals, and a circuit, connected to the tap transducer elements, for combining the output signals of these transducer elements to form reply signals. In order to reduce the effect of spurious signals, the tap transducers are arranged both in series and in parallel with respect to the path of travel. [A3784]

"Chirp signal gating circuit for expander in a pulse compression radar system"

A gating arrangement for a pulse compression circuit includes a surface acoustic wave delay line SAW responsive to an input pulse to generate a frequency-modulated radio-frequency output signal which is applied to an output gate OG. The output signal is also applied to circuit means DC operable to product a digital pulse corresponding to each cycle of the output signal. The pulses are counted by a counter CT and applied to control means CM. This responds to first and second predetermined counter states to control the operation of the output gate OG. [A3785]

"Radar channel including an orthogonal MTI filter pair"

In a radar operating in a moving target indication (MTI) mode with frequency diversity by transmitting N+1 pulse bursts and receiving echo signalling therefrom, a radar channel is included for doppler processing the received N+1 pulse echo signal bursts. Each pulse of the same burst envelopes a fixed carrier frequency. The radar is operative to change the transmitted carrier frequency from one pulse burst to another. The radar channel comprises an MTI filter operative as two different orthogonal MTI filters, each having a frequency response similar to an N-pulse MTI filter, to process functionally in parallel a received N+1 pulse echo signal burst to generate a filter signal from each functional filter. Also included is apparatus for combining the two filter signals non-coherently to generate a composite signal corresponding to the N+1 pulse echo signal burst for target detection. The radar channel is operative to process N+1 pulse bursts with either fixed or variable interpulse periods. The two functionally operative filters have frequency response characteristics substantially similar to each other for target echo signals, but effect uncorrelated noise output signals corresponding to a common N+1 pulse echo signal burst. [A3786]

"MTI Radar"

An MTI radar provided with a MTI processor which includes a single erasing circuit for erasing a vector signal due to a stationary target from among all the input vector signal of reflected waves both from a moving and a stationary target, and an arithmetic circuit for removing any other variations than ones from the moving target by calculating the inner product of the post-single-erasing vector signal and a pre-erasing vector signal. [A3787]

"Microwave detection system"

A microwave detection system is constructed which is useful for detecting the presence or absence of a target within a microwave transmission line. [A3788]

"Radar device"

The novel radar device (1) radiates triangularly frequency-modulated continuous-wave signals via two radiation patterns (3, 4) . If an object (2) is detected by one radiation pattern at a time, relative velocity (V.sub.1, V.sub.2) and distance (r.sub.1, r.sub.2) are measured. The time between the measurements with signals received via the first and the second radiation pattern, respectively, is t. If the velocity of the object (2) relative to the radar device is V.sub.1 =0 when it is detected by the first radiation pattern, the associated distance is r.sub.10. The velocity of the object is determined either by the equation ##EQU1## or by either of the equations ##EQU2## A combination of V.sub.A and V.sub.B is also possible. If the object is so large in extent as to be detected by both radiation patterns simultaneously, switchover between the two radiation patterns is effected at a given clock rate. If no pairs of values are used at which V.sub.1 =0, the evaluation is performed in accordance with either of the equations ##EQU3## [A3789]

"Navigation warning system and method"

A navigation warning system and method for vessels includes one more earth satellites which electro-optically scan whole bodies of water whose signals are analyzed by a computer either on a satellite or at a ground location. The analyzing computer includes a memory which contains coordinates of hazardous ocean conditions. The computer automatically analyzes images generated by vessels travelling within the scanned area and detects when two vessels are on a collision course. Automatic visual and sound indication including a voice recording reproduction unit alerts vessel operators of impending collision conditions. The system may include automatic control of the vessel in response to signals generated by the computer for either modifying the control signals or supplying the computer with information transmitted thereto from the satellite and generated either by analyzing computer in the satellite or by the ground location which is in communication with the satellite and receives information generated by the electro-optical scanner. [A3790]

"Speed detecting device employing a Doppler radar"

A speed detecting device comprises a comparing circuit for comparing the amplitude of a Doppler signal with a reference amplitude value, and an excluding circuit for excluding a speed signal corresponding to the Doppler signal of the amplitude smaller than the reference amplitude value, whereby the speed signal corresponding to the Doppler signal of the amplitude larger than a predetermined value. One embodiment of the device further comprises a circuit for selecting and outputting a Doppler signal of the largest amplitude, thereby detecting a vehicle speed based on the Doppler signal of the largest amplitude. Another embodiment of the device comprises a modulator for sequentially changing transmitting frequency of the Doppler radar into a plurality of frequencies at a predetermined period, a detector circuit for detecting each Doppler signal from the Doppler radar in synchronism with the change of the transmitting frequency, a signal processing circuit for forming a Doppler signal corresponding to the transmitting frequency, and a selecting circuit for selecting a Doppler signal of the largest amplitude. [A3791]

"Surface acoustic wave passive transponder having optimally-sized transducers"

A passive transponder for use in an interrogation/transponder system comprises a substrate having a substrate surface defining a path of travel for surface acoustic waves, a launch transducer element arranged on the surface for converting interrogating signals into surface acoustic waves which propagate along the path of travel, a plurality of tap transducer elements arranged on the surface at spaced intervals along the path of travel for converting surface acoustic waves into respective output signals, and a circuit, connected to the tap transducer elements, for combining the output signals of these transducer elements to form reply signals. In order to maximize energy conversion from the interrogation signals to the reply signals, the launch transducer is made larger than the tap transducers. [A3792]

"Intrusion detector"

An intrusion detector system with a transmitter having a clock operating at a selected frequency, a pseudorandom code sequence generator for generating one of a selected number of codes, a modulator for spread-spectrum modulating an electromagnetic signal with the generated pseudorandom code sequence signal, and an antenna for transmitting the modulated signal through a zone of protection, and a receiver having an antenna, a demodulator for detecting and demodulating the modulated signal to recover the transmitter pseudorandom code sequence signal, a clock operating at a frequency corresponding to the transmitter clock, a pseudorandom code sequence generator for generating one of a selected number of receiver code signals corresponding to the transmitter code signals, a detector for comparing the received code signal to the receiver code signal and generating a detection signal proportional to the signal amplitude of the received code signal when locked in phase with the receiver code signal, a phase detector for detecting the phase difference between the two code signals, a control for phase synchronizing the two code signals, and a monitor for detecting and signalling changes in the detection signal resulting from entry of movement of an intruder in the zone of protection. [A3793]

"Surface acoustic wave passive transponder having non-reflective transducers and pads"

A passive transponder for use in an interrogation/transponder system comprises a substrate having a substrate surface defining a path of travel for surface acoustic waves, a launch transducer element arranged on the surface for converting interrogating signals into surface acoustic waves which propagate along the path of travel, a plurality of tap transducer elements arranged on the surface at spaced intervals along the path of travel for converting surface acoustic waves into respective output signals, and a circuit, connected to the tap transducer elements, for combining the output signals of these transducer elements to form reply signals. In order to minimize reflections from the edges of the transducer elements, these elements are configured with serrated edges facing the path of travel. [A3794]

"Proximity radar"

A proximity radar is described in which a signal phase modulated in accordance with a pseudorandom sequence is transmitted from an antenna, and a return signal reflected from a target is received by this antenna. The return signal is correlated with a signal identical to the transmitted signal but delayed by a selected time interval. The delay imposed on the transmitted signal as fed to the correlator is alternately given the two values n.t and n'.t where n' is less than n and the time interval n.t corresponds to the time taken by the signal to travel to and return from the target when the radar is at a predetermined distance from the target, which distance is to be detected. The correlator output is fed through an amplifier circuit including an automatic gain control circuit when the delay is n'.t and the automatic gain control circuit is inoperative when the delay is n.t. [A3795]

"Vehicle travel control device"

A vehicle direction control device is provided including three receivers in the vehicle with the center receiver controlling the direction along a primary cable in the roadway with change of direction cable systems taking over control through a side receiver originally parallel with the main line of travel, diverging to a new direction and then picking up a parallel relationship with a new primary line of travel automatically switching back to the center receiver control along the new line of travel. [A3796]

"Motion picture camera automatic focusing system"

A focusing system for a variable focus lens of a motion picture camera includes a pulse modulator and a microwave transmitter mounted on a camera frame for generating a high frequency pulsed signal which is transmitted to a selected target which carries a reactive signal generator that is responsive to the first signal for coding and retransmitting the coded signal back to a receiver mounted on the camera frame, and a signal processor for determining the interval of travel of the signal and translating the interval into a distance-analog signal that is transmitted to a focusing motor for driving the focusing mechanism of the lens for focusing the lens at the distance determined by the signal. One alternate embodiment includes multiple reactive signal generators having distinctive signal responsive controls and portable remote transmitters for selectively switching to the selected ones of said reactive generators. Another embodiment includes a system for synchronizing the controls of multiple cameras for preventing interference between them. [A3797]

"Vector phase angle change distribution processor"

A system and technique is disclosed for estimating the real-time spectral width of radar returns to provide an indication of weather turbulence. The system includes a Doppler radar to provide the in-phase and quadrature phase signals from successive range returns which are digitized and converted to a phase angle prior to processing. Successive angular samples at the pulse repetition frequency are subtracted to provide a phase angle change. The phase angle change is filtered to determine an average angular mean which is then subtracted from new angular samples to determine the angular deviation. The angular deviation for each sample is in turn compared with a threshold to provide an output which is averaged over time to determine when the standard deviation of the samples exceeds a reference value. When the standard deviation of the samples exceeds that reference value, the spectral width is of a magnitude which indicates the presence of turbulence. [A3798]

"Method and apparatus for evaluating the range data accumulated by distance measuring equipment"

This invention discloses a DME which employes an improved technique for validating received replies. The technique employed reduces lock-on time by analyzing all of the range data received within a set time period following the transmission of an interrogation pulse pair rather than just one range figure for each interrogation cycle. The DME also provides improved accuracy and reliability by varying the width of the range gate used in analyzing the received range data in accordance with the time difference between the two interrogation cycles from which range data is being compared with system status, i.e., whether the system is in the locked position or not. [A3799]

"Movement monitor"

A proximity monitoring system for individually identifying an object or person, and having a central information processor, and a signal receiver, several remote detectors in various locations at a distance from the information processor, each having a first transmitter for communicating with such processor and having a second transmitter and a receiver, and several individual personalized portable identifiers, each identifier having a continuously activated receiver, a signal transmitter which is normally de-activated, a battery pack, and a switch operated by the receiver in response to a signal from a detector, to switch the battery on to activate the transmitter, for emitting a personalized coded identification signal. [A3800]

"Methods and apparatus for measuring a length of cable suspending a well logging tool in a borehole"

Methods and apparatus are disclosed for measuring a length of logging cable introduced into a borehole, thereby measuring the depth of a logging tool, or sonde, attached to the lower end of the cable. The methods involve producing an electrical signal, which propagates along the cable, and detecting at the mouth of the borehole the time of passage of the initial electrical signal and the time of passage of a subsequent electrical signal reflected or returned upwardly from the lower end of the cable, or, alternatively, the time of arrival of the reflected or returned electrical signal at the upper end of the cable. These times can be determined by means of clocks which are switched on by the passage of the initial electrical signal and switched off by the subsequent electrical signal. Knowing the time intervals and the velocity of propagation of electrical signals in the cable, the length of cable from the mouth of the borehole to the lower end of the cable, and thus the depth of the sonde, is measured. Various embodiments of apparatus including electrical signal detectors which do not electrically contact the cable are disclosed for sensing the electrical signals necessary for measuring the length of cable introduced into the borehole, and thus the depth of the sonde. [A3801]

"Electronic surveillance system employing the doppler effect"

A coherent frequency, velocity responsive electronic surveillance system detects the motion of a transponder relative to two receiving antennas on opposite ends of a surveillance zone positioned at the exit of a retail store. Motion in opposite directions relative to the two antennas indicates that the transponder is within the surveillance zone. As a means of reducing false alarms, motion of a transponder proximate to, but outside the zone is distinguished from motion inside the zone because motion outside the zone is in the same direction relative to both antennas. False alarms are reduced even further by requiring detection of motion through a selected distance before indicating an alarm. [A3802]

"Out-of-range personnel monitor and alarm"

An out-of-range monitor and alarm system that may be used by a convalescent home or the like to alert an attendant in the home that a supervised person has walked beyond a predetermined prescribed distance. The system includes a base unit that transmits a signal at a frequency F1 to a receiver in a mobile unit carried by the supervised person. The receiver includes a threshold circuit that is adjustable to correspond to the prescribed distance and produces a threshold output signal whenever the F1 signal detected by the receiver drops below the threshold level. In response to the threshold output signal, a transmitter in the mobile unit produces an F2 output signal to a receiver in the base unit, which in turn sounds an alarm indicating that the mobile unit has lost adequate F1 signal strength, as determined by the threshold adjustment, by exceeding the range prescribed for the supervised person. [A3803]

"Navigation system including an integrated electronic chart display"

A navigation system particularly adapted for ships making a passing within a harbor or the like, utilizing signal inputs from on-board vessel position determining equipment such as Loran or Decca apparatus and an on-board object detecting equipment such as a radar or sonar apparatus. The system further includes an on-board vessel position computer which operates in a differential Loran mode in response to observed Loran time differences, stored data from an initial calibration, and Loran grid offset data from an on-shore monitor system to compute a highly accurate current or present position fix in longitude and latitude whereupon the computer causes a predetermined electronic chart to be displayed in color on the screen of a cathode ray tube, being generated from a plurality of electronic charts stored in the form of digital files in memory. The selected chart, together with the present position of the ship, is displayed along with preselected alpha-numeric indicia of data relating to bearings, way points, ranges, "time to go", etc., also generated in accordance with the computed vessel position. Radar target returns of the local land mass and other stationary moving targets are additionally received by the ship's radar. The radar image of the target echoes is next referenced to and superimposed on the electronic chart generated, however, the radar's land mass echoes are suppressed in favor of the electronic chart land mass while displaying all other targets. [A3804]

"Tracking servo compensator with rate aiding"

A tracking servo compensator is disclosed for radar systems which steer their antenna beams using a servomechanism that physically moves the antenna. The disclosed tracking servo compensator permits switching between trackers (e.g. from area to point track) and from one tracked target to another without undesirable transients that could cause loss of track. Rate aiding and target range estimates are provided when tracker base motion is known. The compensator works by providing a servo signal that continually monitors the error in estimated track point line-of-sight angular velocity independent of which tracker is employed or the target being tracked. When base motion is known, this signal is used to update the target range estimate so that an accurate rate aiding signal is available. The servo provides smooth controlled-speed transitions between track points during mode switching, and provides an input for manual slewing of the tracker platform during offset track conditions. It also provides an estimate of platform to track point range. [A3805]

"Microwave electromagnetic borehole dipmeter"

A borehole logging tool includes three microwave antennas positioned from the longitudinal axis of the tool and spaced approximately equally around the axis. Microwave energy from a pulsed source is applied to the antennas during a plurality of microwave transmission periods. During a plurality of microwave reception periods, the amplitudes and the phases of the microwave energies received by the three antennas are measured for use in the determination of the dip of the formations surrounding the borehole. [A3806]

"Range doppler coupling magnifier"

A pulse expander-compressor for magnifying the range-doppler-coupling effs that accompany the use of frequency-modulation derived phase coded pulse compressors in order to accentuate the doppler-coupling velocity effects on target echoes. The foregoing magnification is accomplished by generating a doppler tolerant polyphase coded waveform with equal time spaces inserted between successive code elements in order to make the time difference between the first and last code elements independent of the number of code elements involved. These equal spaces may be variable in order to allow any desired target radial velocity to produce a phase difference between the first and last code elements of 2.pi.. The foregoing may be implemented in a pulse expander-compressor by replacing each delay t.sub.c in the compressor input-signal expansion circuit by a set of N delay elements t.sub.c, and a set of N associated switches, the switches permitting each element in the set to be connected or bypassed, as desired. The time-dispersion circuit for the compressor is likewise modified by replacing each of its Mt.sub.c delays by a set of N delay elements Mt.sub.c, each of which is independently connectable or bypassable. [A3807]

"Multi-product acousto-optic time integrating correlator"

A device for processing signals to obtain a multi-product, time integrated, correlated output signal. A laser light beam is expanded and shaped into a sheet beam which is directed across the surface of an acousto-optic medium. Four acoustic transducers are disposed on the acousto-optic medium, two at each end of the medium. Each acoustic transducer is supplied with a signal to be propagated on the surface of the acousto-optic medium. The first two signals diffract the sheet beam to produce a first, product diffracted beam of light containing the product of the first two signals. The second two signals diffract the sheet beam to produce a second product diffracted beam of light containing the product of the second two signals. The two product diffracted beams are rotated so that they are orthogonal to each other, and then combined. A time integrating photodetecting means is disposed in the path of the combined beam for generating a multi-product, time integrated, correlated output signal. [A3808]

"Radar systems"

A radar system includes signal processing means (SP) operable to determine the velocity relative to a receiving antenna (AR) of each object from which transmitted radiation is reflected. The signal processing means delivers signals representing the relative velocities of objects in each of a number of predetermined ranges of velocity values. Storage means (SM) are provided which comprise, for each increment of antenna bearing, a separate storage location for each of the ranges of velocity values. Circuit means (CM) are operable to read out the contents of the storage means and to modify signals delivered by the signal processing means (SP) in accordance with the contents of the storage means (SM) to provide output signals. In addition the circuit means (CM) is also arranged to further modify the output signals to provide new contents for the storage means. [A3809]

"Range reply search apparatus"

Apparatus for searching for range indicating pulse signals received as part of distance measuring equipment which first form a list of distance indications in a first search time. The distance indications obtained in a second search time are then logically combined with those indications in the first list and any combination that results in a difference value of less than a prescribed amount is retained for list updating purposes until there is only a single distance indication left in the list. The apparatus can then change to a track mode by placing a search window around the single distance indication thereby reducing the amount of extraneous information to be manipulated by the receiving apparatus. [A3810]

"Environmental mapping system"

A circuit which detects environmental sources of echos received by a pulscho system such as a radar and classifies the sources of the echo at each range resolution cell as either short-pulse interference, rain clutter or jamming, distributed land clutter, an isolated target or thermal noise. The circuit implements on the screen of a cathode ray tube a digital map of a selected echo source type by modulating the electron beam intensity with a binary digit (0 or 1) at each increment of the sweep corresponding to a range resolution cell. The circuit utilizes a pulse-to-pulse noncoherent subtraction to remove correlated echos, leaving only uncorrelated type echos. Short-pulse interference is then detected and the uncorrelated echo component is compared to thermal noise to determine if rain clutter or noise jamming is present. The threshold for either target detection or land clutter is determined from the uncorrelated echo component, and all correlated targets and land clutter are next detected. The correlated echos are separated into distributed land clutter and isolated targets by the following procedure: the isolated targets are required to have uncorrelated echos on each side of them in range. Finally, if no detection of any of these types is made, thermal noise is declared. [A3811]

"Receiver for a sounder permitting the detection and measurement of phonomena linked with the earths environment"

Receiver for a sounder for the detection and measurement of phenomena linked with the earth's environment, wherein it comprises a reception channel, whereof one input receives the echo signals of the electromagnetic signals emitted towards the phenomenon, an electromagnetic signal frequency shift and amplitude-calibration test channel, whereby the reception channel comprises a first stage having in series means for filtering, attenuating and amplifying the echo signals received, a second stage comprising in series means for the frequency conversion attenuation, filtering and amplification of the signals received from the first stage, and a third stage comprising in series means for frequency conversion, filtering and amplification of the signals received from the second stage, the attenuation means of the first and second stages being independently controllable for each frequency of the signals which they receive, in such a way that the signals from the corresponding amplification means have an amplitude higher than the amplitude of the distortions produced by the reception channel and the amplitude of the interference signals received by the reception channel. [A3812]

"Ground surveillance Doppler radar"

The invention relates to Doppler radar making it possible to subject the ground to surveillance. It consists of providing a conventional Doppler radar having a transmitter, a receiver, processing means making it possible to supply a binary signal indicating the presence or absence of a moving target in the given distance gate series and a display screen with means making it possible to take account of certain relative danger criteria, as a function of the distance at which the targets are located and as a function of the speed at which they are moving. These means make it possible to control the screen, in order that the relative danger is displayed in the form of an overbrightness for the targets considered dangerous. It makes it possible to improve the display conditions of ground surveillance Doppler radars. [A3813]

"Retrospective data filter"

In a target detection communication system, apparatus and method for determining the presence of probable targets based on contacts (which can indicate the presence of a target, noise, chatter, or objects not of interest) detected within a predefined position sector or sectors over a specified number of scans. The position of each detected contact, as a contact of interest, is compared with the positions of contacts detected at previous times or scans. Velocity profiles indicate which previous contacts support the likelihood that the contact of interest represents a target having a velocity within a defined band. The likelihood, which can be represented by a quality value, may be a function of number of contacts, timing of contacts, or both the number and timing of contacts in a given velocity profile. A preselected threshold value, which is related to false alarm rate, is compared to the most likely, or highest quality, velocity profile associated with a contact of interest. If the highest quality value exceeds the threshold value, an output is provided indicating that the contact of interest represents a probable target having a velocity within the band defined by the highest quality velocity profile. [A3814]

"Moving obstacle detection system for a vehicle"

A moving obstacle detection system using a Doppler radar device for an automotive vehicle which detects and informs a vehicle driver that another vehicle (moving obstacle) approaches or moves away from the detecting vehicle, wherein there is provided a means for determining whether the rate of change of the period of a Doppler signal outputted from the Doppler radar equipment with respect to time exceeds a predetermined value so that an erroneous alarm in response to a pedestrian or another vehicle traversing the front detection area of the vehicle, e.g., when vehicle is at rest at in an intersection is inhibited. Consequently, more reliable detection of approach or departure of another vehicle can be achieved. [A3815]

"Moving obstacle detection system for a vehicle"

A moving obstacle detection system for an automotive vehicle utilizing a doppler effect of the transmitted wave against an obstacle which runs in front of the vehicle such as another vehicle. The system generally comprises: (a) a doppler radar unit which operates so as to produce a doppler signal when the vehicle is halted, (b) a detecting means which detects the changing phase of a doppler signal produced from the doppler signal, (c) a discriminating means which discriminates the departure of another vehicle from the front area of the vehicle and the intersection of another vehicle or pedestrian traverse to the vehicle on a basis of the frequency changing rate or amplitude level changing rate of the detected doppler signal, and (d) an alarm unit which produces an alarm in a predetermined form only when the departure of another vehicle from the front detection area of the doppler radar unit or in the case when another vehicle straightly approaches or departed from the vehicle and in the case when another vehicle or pedestrian goes across the vehicle, separately from each other. [A3816]

"Search radar apparatus"

Search radar apparatus containing an MTI video processing unit provided with: a canceller for generating video signals of moving targets, a zero-velocity filter for generating clutter video signals, a conditional circuit connected to the canceller and the filter for generating per range quant of each radar scan a clutter switching signal if for the rang quant the signal value obtained with filter is greater than the signal value obtained with the canceller, a combination circuit connected to said filter and the conditional circuit for selecting the clutter video signals present with the clutter switching signals and for determining therefrom a temporary clutter level in each clutter cell and each antenna revolution period, and clutter level indication means connected to the combination circuit for determining a standard clutter level per range-azimuth clutter cell of the radar range with the application of clutter video signals. [A3817]

"Pilot assistance device"

A device working in conjunction with commercial-grade radar equipment for accurately pinpointing the location of a target or a topological feature with a precision greatly superior to the specified resolution of the radar equipment. This high precision is obtained through on-line treatment of the radar echo signals as the radar scans the target area. In the preferred embodiment of the invention, the device is used for assisting a pilot in steering a ship navigating through coastal or inland waterways. The device provides statistically weighted data relative to the location of a plurality of landmarks in the vicinity of the ship to a KALMAN filter-type circuit which in turn generates an accurate state vector reflecting the ship's present and near future movement. In the course of an initial surveying pass through the waterway, the device can also generate reference charts of the area to be traveled. The device can also be applied to other types of surveying tasks, to the implementation of anti-collision apparatuses, and to other systems requiring a high degree of precision in the measurement of surrounding objects. [A3818]

"Radar terrain signal suppressor"

An apparatus for the suppression of terrain generated clutter in a pulsed weather radar system. Weather induced returns typically having scintillation frequencies greater than 50 Hz may be isolated from terrain backscattered signals utilizing a digital filter technique having a sampling rate equal to the pulsed radar PRF. [A3819]

"Range-enable information system for plural mobile objects"

An information system for communicating information from each of a plurality of separate locations to each of a plurality of mobile objects includes a beacon at each location and a beacon triggering and detecting apparatus mounted on each object. Each beacon triggering and detecting apparatus is assigned a predetermined and unique time window within a common system cycle. During the initial portion of its window, the beacon triggering and detecting apparatus transmits a trigger signal at a frequency f.sub.1, with the trigger signal as transmitted having a substantially constant amplitude and with frequency f.sub.1 being chosen so that the intensity of the trigger signal decays as the cube of radial distance from the object. If the object is within a predetermined beacon trigger range of a location, the beacon at that location detects the trigger signal and transmits a beacon signal at a frequency f.sub.2 (substantially greater than frequency f.sub.1) during the terminal portion of the window which is detected by the beacon triggering and detecting apparatus. The beacon signal contains any information that is desired to be communicated from the location to the objects, such as the identity or location of the beacon. Provision is made for synchronizing the various beacon triggering and detecting apparatus by signals at a frequency f.sub.3 (that is distinct from frequencies f.sub.1 and f.sub.2) from a base station, for disabling operation of a given beacon triggering and detecting apparatus upon the failure of that apparatus to be synchronized by the base station for a predetermined period of time, and for transferring the information that has been communicated from each location to each object to the base station for further processing and centralized information display. [A3820]

"Chirp transform correlator"

A chirp transform correlator having asynchronous operation is made possible by the use of a pair of paralleled signal processing channels to which the unknown signal to be correlated is applied. The two channels include sweeping local oscillators which are interlaced in timing so that any arbitrarily timed unknown input signal will be fully transformed by one or the other of the channels. [A3821]

"Automatic vehicle identification system and method"

An automatic vehicle identification system for use in identifying and routing vehicles, such as railway cars or other vehicles which routinely travel a given track or path. A passive electronic device or electrical circuit is employed to intersect an energy field and respond thereto by generating a code in accordance with energy received and converted to coded electrical signals. Connected to the passive device is a short wave transmitter for transmitting signals generated by the electrical device when so energized. The electrical device may also comprise a plurality of different induction coils or antenna which serve to modify an energy field in a given manner, which modification may be detected by short wave sensing and converted to a coded electrical signal which is employed to identify the vehicle. In another form, a coded array of antenna or induction coils is provided which modify energy fields generated at check points or scanning locations along a trackway or roadway, wherein such energy field modifications are sensed at each such scanning location, resulting in the generation of an electrical code at each location and identification of the vehicle. [A3822]

"MTI Velocity discriminator"

A digital Moving Target Indicator (MTI) radar system for rejection of low velocity "clutter" by utilizing techniques to identify those radar echo returns from targets having radial velocities lower than fixed predetermined values. for digital MTI radars that have a response which is a periodic function of the radar's Pulse Repetition Frequency (PRF) and doppler frequency shift of the received radar signal relationships exist whereby (a) optimum target velocities which correspond to the maximum canceler gain can be calculated from the radar's PRF, (b) the canceler response can be expressed in terms of a periodic canceler response function which incorporates the ratio of the actual target velocity to the optimum target velocity, and, (c) the output amplitude from the canceler can be determined from the input amplitude to the canceler produced by the MTI receiver's coherent phase detector and the periodic canceler response function. Thus, for a particular target velocity and a number of different input amplitudes the corresponding output amplitudes from the canceler are calculated. These canceler output amplitudes are stored in an electronic memory which is accessed in terms of the input amplitude produced by the coherent phase detector. The canceler output amplitude read from the memory is compared with the actual canceler output to determine whether the output should be treated as clutter or a target having a radial velocity greater than the preselected fixed value. [A3823]

"Apparatus and method for the correction of attenuation-induced errors in a weather radar receiver"

Disclosed is a method and apparatus for adjusting the gain in a weather radar receiver to correct for precipitation induced transmission path attenuation. The receiver gain is controlled in a known manner to accommodate known path transmission effects. The gain controlling apparatus comprises fixed and variable AC resistances, where the variable AC resistance is an attenuator diode driven by a varying current source. The variable current source provides an approximation to a hyperbolically decreasing current when no video returns or echoes are present. However, upon sensing the existence of a video return indicative of rain at a moderate intensity, a portion of the charge on the RC networks in the current generator is shunted to ground, increasing the rate of change of current provided by the current source. This modification of the attenuator substantially reduces attenuation-induced receiver errors present within the sensitivity time control (STC) interval. [A3824]

"Method and apparatus for intrusion detection"

CW intrusion detection method and apparatus are shown comprising first and second CW Doppler radar systems which include first and second antennas, respectively. The first antenna is located adjacent ground level for illumination of a protected area adjacent the ground. The second antenna is located directly above the first antenna a spaced distance therefrom, and illuminates the same protected area adjacent the ground. In response to movement of an intruder along the ground in the protected area, first and second Doppler difference frequency signals are obtained from the first and second radar systems. Using the first and second Doppler difference frequency signals, a signal proportional to distance of the moving intruder from the first antenna is generated. Memory elements for storage of combinations of amplitude, range and/or velocity criteria signals are provided and, when the signal proportional to distance and at least one of the first and second Doppler difference frequency signals match the criteria signals, an alarm signal is produced. [A3825]

"Method and apparatus for enhancing radiometric imaging"

Disclosed is a method and apparatus for enhancing target detection, particularly in the millimeter wave frequency range, through the utilization of an imaging radiometer. The radiometer, which is a passive thermal receiver, detects the reflected and emitted thermal radiation of targets within a predetermined antenna/receiver beamwidth. By scanning the radiometer over a target area, a thermal image is created. At millimeter wave frequencies, the received emissions from the target area are highly dependent on the emissivity of the target of interest. Foliage will appear "hot" due to its high emissivity and metals will appear cold due to their low emissivities. A noise power illuminator is periodically actuated to illuminate the target of interest. When the illuminator is actuated, the role of emissivity is reversed, namely poorly emissive targets will generally be good reflectors which in the presence of an illuminator will appear "hot". The highly emissive targets (such as foliage and dirt) which absorb most of the transmitted energy will appear almost the same as in a non-illuminated, passive image. Using a data processor, the intensity of the passive image is subtracted from the intensity of the illuminated, active image which thereby cancels the background foliage, dirt, etc. and the reflective metallic targets are enhanced. [A3826]

"Method and apparatus for automatic control of driving speed"

A system for automatically controlling driving speed includes a fixed speed driving device for keeping the driving speed at a predetermined speed and a control device for maintaining an optimum interval between the vehicle and the vehicle driving ahead. A hold circuit for holding the optimum driving speed, based on the distance from the vehicle driving ahead, is actuated by a circuit for detecting curves in the road, whereby the hold circuit maintains the driving speed of the vehicle as it rounds a curve at the optimum driving speed determined for the vehicle before it entered the curve. [A3827]

"True ground speed sensor"

A Doppler radar sensor is disclosed for use as a true ground speed sensor for a ground vehicle. The sensor comprises novel features resulting in a more efficient construction and improved performance. The sensor comprises an ellipsoidal reflector and when used as a true ground speed sensor in a ground vehicle the far focus is at the surface of the ground. [A3828]

"Method and apparatus for monitoring vehicle ground movement in the vicinity of an airport"

The invention provides an apparatus for processing radar returned video signals in the vicinity of an airport including at least one runway and at least one vehicle roadway intersecting the runway, in order to assist air traffic controllers in detecting potential hazardous situations. Radar returns from each of plural geographic monitored locations are compared with a simulated return for each corresponding location to detect a moving object at any of said geographic monitored locations. The presence of a moving object at one of such locations may be indicative of a hazardous situation, and in that event, the air traffic control operator may be warned by an alarm or the like. [A3829]

"Microwave frequency synthesizer using plural switchable low noise oscillators"

Disclosed is a low noise microwave frequency synthesizer having a plurality of rapidly switchable output frequencies. Two banks of oscillators are selectively mixed to yield a range of output signals of low phase noise and low spurious noise. The first bank of oscillators comprises low noise, highly stable oscillators of a frequency range below the desired synthesized output signal. The second bank of oscillators comprises low noise, highly stable oscillators of a frequency range lower than the first bank. The signal from the second bank of oscillators is frequency multiplied to a desired frequency range by a low multiplication factor and then mixed with the signal from the first bank of oscillators. Multiplied phase noise is reduced by using a low multiplication factor. The upper sideband of the mixed signals is output as the synthesized output signal. Rapid switching between oscillators in both banks provides a frequency range of synthesized output signals which may be rapidly stepped through as desired. [A3830]

"Quasi coherent two-way ranging apparatus"

An accurate radio frequency ranging system is provided for measuring the time required for a signal to be transmitted from a ground station to a remote station and to be returned to the ground station. The ground station is provided with a master reference clock that is employed to drive a first pseudonoise generator. The ranging system in the ground station is started by a unique and predetermined start epoch signal produced by the first pseudonoise generator. The first pseudonoise generated signals are transmitted to the remote station where they are tracked and sensed. When the original start epoch signal is sensed at the remote station, it is employed as a trigger or read signal to initiate the generation of a stop epoch signal. The stop epoch signal is retransmitted to the ground station and stored in a register where it is compared with pseudonoise generated signals being retransmitted from the remote station to the ground station. When the correlation between the two signals occurs, a new epoch stop signal is produced which stops the timing of the ranging system in the ground station. Since the pseudonoise generated signals transmitted from the remote station to stop the ranging system in the ground station are not locked on to the pseudonoise signals being transmitted from the ground station to the remote station, there is no requirement for turn-around coherency. [A3831]

"Remote passive identification system"

A system for passively identifying remote objects such as livestock is disclosed. A power transmitter transmits a plurality of radio frequency burst signals at a given frequency, and a uniquely coded transponder associated with the object to be identified produces a plurality of coded identification signals in response to the burst signals from the transmitter. The coded identification signals are read by a receiver to identify the object. The transmitter and receiver are time division multiplexed for alternate operation. Accordingly, when an object is to be identified, the transmitter is switched on to transmit the burst signals, thereby activating the transponder to produce the coded identification signals. The transmitter is then switched off and the receiver switched on to receive the identification signals for identifying the object. [A3832]

"Automatic adaptive sensitivity time control for a ground mapping radar"

An automatic adaptive sensitivity time control for a ground mapping radar comprises the dynamic range of radar returns for presentation on a video display. A feedback loop including a differential amplifier senses the magnitude of a signal presented to a limit amplifier and compares the same with a clutter threshold reference potential. A low-pass filter in the feedback loop then smooths or averages the clutter deviation from the reference potential to adjust the clutter level out of a log IF amplifier so that the nominal clutter signal level of close-in returns does not exceed a predetermined magnitude. A second embodiment includes a dual time constant filter in the feedback loop. A comparator circuit senses the leading edge of clutter return signals and switches the feedback loop to its faster time constant mode allowing dynamic compression of smaller time constant pulses. [A3833]

"Automatic braking system for vehicles"

An automatic braking system for a vehicle including an automatic command system giving a command including at least one braking signal of a level in response to the need for braking, a fluid pressure source, a braking device having an input member which is manually actuatable, and a device for actuating the input member by applying thereto a fluid pressure from the pressure source in response to the level of the braking signal. An automatic braking may thus be performed while permitting manual braking to be simultaneously effected. [A3834]

"Synthetic pulse radar system and method"

The invention includes a method and apparatus for detecting geophysical phenomena by the use of a synthetic pulse radar. A radar transmitter generates a plurality of component signals of different frequencies which approximate at least a portion of the Fourier transform of a radar short pulse. These component signals are transmitted simultaneously for modulation by the geophysical phenomena, and the modulated component signals are substantially simultaneously received in a receiver. The receiver divides the component signals, and as to each determines representative parameters. The invention also includes a heterodyne receiver which operates with a fixed IF frequency and incorporates a single frequency quadrature system. [A3835]

"Method of producing velocity-aided range gates"

A method of producing a control signal for a range gate in a pulse Doppler radar, the method encompassing the steps of periodically determining the range slip of a selected target and then changing the position of a range gate during each range sweep in accordance with the determined range slip. [A3836]

"MTI Radar adaptable to different environmental conditions"

A radar of the MTI type has a transmitter connected to a source of outgoing pulses whose carrier frequency is variable under the control of a mode selector for selective operation with fixed frequency, frequency diversity or frequency agility, depending on detected environmental conditions. A multiweight Doppler filter serves for the detection of mobile targets in each of these three modes. With frequency-agility operation, samples of echoes of an outgoing pulse received during a given sweep are stored in a memory in accordance with the carrier frequency used for that pulse, this frequency changing in random fashion from one pulse to the next among a certain number of predetermined values. A timer selecting the outgoing frequency also controls a multiplexer which during each sweep delivers to the Doppler filter up to m correlated samples of the same frequency stored in the memory during the last n sweeps, with n>,m determined by the width of the antenna beam to ensure that the samples concurrently evaluated by the filter come from the same target. [A3837]

"Method and means for providing frequency agile operation of MTI _radar"

The obtaining of simultaneous pulse-to-pulse transmitter carrier frequency agility and compatible moving target indicator (MTI) operation in conventional surveillance radars is achieved by the use of pairs of frequencies with a controlled relationship between the frequencies of each pair. A set of four pulses with different frequencies is sequentially transmitted and form two pairs of pulses. The difference between the frequencies of one pair of pulses is made equal to the difference between the frequencies of the second pair of pulses. MTI operation is obtained by differencing the pairs. Pulses having any three frequencies may be selected in any sequence before a constraint is imposed. The frequency of the fourth pulse is then determined by the frequencies of the first three pulses. [A3838]

"Intervehicle distance control system for vehicles"

An intervehicle distance control system for a vehicle which, when there exists a possibility of collision between the vehicle and an interfering object ahead thereof, generates a control signal and imparts to a vehicle accelerator member an operation reaction force corresponding to the control signal. The driver is thereby alerted as to a possibility of collision, while the selection of acceleration operation is substantially entrusted to the driver. In the absence of such control signal, the reaction force has a strength of substantially zero. Regardless of the vehicle speed, the driver will never suffer from a metal burden due to operation of the control system. [A3839]

"Radar ground speed sensing system"

A Doppler radar speed sensing system includes a microwave transceiver and a circuit for generating an input pulse train having pulsewidths related to the ground speed of a vehicle carrying the system. A signal processor includes a microprocessor which executes a signal processing algorithm which converts the input pulse train to an output pulse train having desired characteristics. for example, the output pulse train has output pulses with pulsewidths and frequency related to the vehicle ground speed. The output signal pulse train responds rapidly to changes in sensed ground speed, but is insensitive to Doppler signal dropout. [A3840]

"Interference suppressor for radar MTI"

An impulse interference suppression circuit for use in combination with an -pulse Moving Target Indicator system comprising a gate connected to block the output signal from the MTI system when energized, and a circuit for taking the magnitudes of successive echo return signals, subtracting the magnitudes of consecutive echo signals to remove clutter, comparing the consecutive difference signals from such subtractions against each other, and generating and applying a blocking signal to the gate if the difference between the subtraction difference signals is above a given threshold level. [A3841]

"Collision avoidance system"

A threat warning collision avoidance system at an Own station that produces pseudo range data, identity and, when available, differential altitude data from standard ATCRBS interrogations and Other station's replies, rejecting the identity and data from Other stations that are outside a proximity space surrounding Own station, and producing a threat alert signal and displaying the identity and associated data of any Other station entering said proximity space. [A3842]

"Method and apparatus for preventing the response of a radar beacon to receive radar pulses originating from the side lobes of a transmitter and an arrangement"

A method for preventing a radar beacon's response to received pulses from a vessel which originate from the side lobes of the vessel antenna. The carrier frequency of the radar signal pulses to and received by the beacon is measured and a value of this frequency is stored when the amplitudes of the signal pulses exceed a certain high threshold level (Th) . If signals after that are received which exceed a low threshold level (Tl) (but not the high) the carrier frequency of such signals is measured and a corresponding value is stored. Measuring two subsequent and equal carrier frequencies is considered as a criterion that a response signal from the beacon responding to the second received signal should not be transmitted. An arrangement to carry out the method is described. [A3843]

"Apparatus for the detection and prevention of collision risks in deep sea and coastal navigation"

Apparatus for the detection and prevention of collision hazards between a ship fitted with a radar on board and moving or fixed obstacles identified on the radar screen on board of the ship, consists in determining with respect to said obstacles, taking into account such parameters as distance, speed and heading thereof, dangerous sectors of the heading and the speed for said ship, plotting said dangerous sectors for the heading and the speed on a support, plotting on the same support the speed vector of the ship, examining whether the end of said vector is within or outside said dangerous heading and speed sectors, a collision risk existing when the end of the speed vector is within at least one of said dangerous heading and speed sectors, and in such case, choosing a new speed vector so as to make the end of such vector be outside the whole of the heading and speed dangerous sectors. [A3844]

"Apparatus for control of clutter breakthrough in MTI radar"

An apparatus for control of ground clutter breakthrough in MTI radar which remove hard limited clutter signals while allowing increased detection sensitivity to moving targets when such strong clutter returns are not present. Logic is provided to prevent the removal of strong moving target return even in the presence of hard limited clutter. [A3845]

"Methods of and circuits for suppressing doppler radar clutter"

Clutter suppressors and methods of clutter suppression for radars which employ the doppler effect for enhancing signals due to moving targets relative to signals due to clutter caused land, sea or rain. Specifically, the disclosure concerns suppressors and methods of clutter suppression for cw doppler, pulse doppler and MTI (moving target indication) radars. The suppressors reduce the occurrence of radar output due to clutter by permitting and prohibiting radar output on the basis of the relative strength of signals that contain doppler frequency components of the radar echo. [A3846]

"Foreground subject-identifying apparatus"

A foreground subject-identifying apparatus includes a signal transmitter for sending forth microwave question signals, a code signal generator for emitting a code signal in response to a question signal delivered from the signal transmitter, and signal-receiving device for interpreting code signal received from the code signal generator. The signal transmitter intermittently generates a microwave check signal in a first operation mode, and sends forth a microwave question signal in a second operation mode. The code signal generator sends forth an output signal in response to a check signal delivered from the signal transmitter, and then the signal receiver causes the signal transmitter to be set at the second operation mode to generate a question signal. [A3847]

"Microwave-type projectile communication apparatus for guns"

Microwave projectile communication apparatus comprises a microwave probe fixed to a gun barrel at its muzzle end. A microwave oscillator, having a reference frequency selected for exciting the single fundamental electromagnetic mode in the barrel, is connected to the probe, for example, through a hybrid mixer configured for extracting, from moving projectile-reflected microwaves, a true Doppler signal for projectile velocity measurements. Connected between the oscillator and the probe is a signal modulator for modulating the reference oscillator signal to the probe. Connected to the signal modulator is a driver signal generator which controls the modulator in a manner enabling information, such as fuse delay time or target range, to be communicated to the projectile fuse. A conventional fire control computer may be used to provide to the modulator the data to be transmitted to the projectile. The barrel muzzle end may be internally shaped to function more effectively as a microwave antenna to enhance communication with projectiles after they have left the barrel. Corresponding methods for microwave communication with fired projectiles are provided. [A3848]

"Millimeter wave monopulse comparator circuit"

An improved monopulse comparator circuit is achieved by a unique circuit layout. Four hybrid junctions are arranged on a low dielectric constant substrate and are interconnected in such way as to form a closed square figure. Distances between adjacent hybrid junctions are thus minimized. Input lines which connect the comparator circuit to a monopulse antenna array are disposed on the substrate external to the closed figure, as are output lines which connect the comparator to a monopulse guidance system. Right angle microstrip to waveguide transitions are used so that the comparator circuit need not be integrated onto the same substrate as the antenna array and the guidance system. The entire comparator layout is channelized to increase isolation between closely spaced lines. [A3849]

"Weather radar with signal compensation for precipitation"

A weather radar incorporating a sensitivity time control modifying circuit for adaptively increasing the gain of the IF amplifier as a function of precipitation rate, thereby increasing the range of the radar through the precipitation and identifying on the display those regions in which the radar might otherwise inaccurately indicate the precipitation rate. Reflections from the precipitation are received by the radar antenna coupled to a mixer wherefrom an IF signal is coupled to the IF amplifier wherein it is amplified in accordance with a gain that is determined by the modified sensitivity time control signal. [A3850]

"Method and apparatus for suppressing clutter"

A method and apparatus for automatic suppression of weather echoes or clutter which can disturbingly appear, apart from the flying target-Doppler signal as further Doppler signals in a pulse Doppler-tracking radar device containing quadrature channels, wherein there is regulated the frequency of the Doppler signals or the phase relationship between the Doppler signals and a reference signal derived from the transmitted signal. [A3851]

"Earth probing radar system"

A ground probing radar method and apparatus which is effective to view the earth in advance of coal mining activity provides visual display of a coal seam and particular discontinuities that may lie therein. The system operates in the frequency range of 10 Megahertz to 5 Gigahertz. The received electromagnetic energy is amplified, sampled and band pass filtered with subsequent time gain amplification. A time analog return signal may be viewed directly and/or the return signal may be digitally processed to enable further signal refinement. A control microprocessor is utilized for both tape record control and digital signal processing, and the processor includes the capability for compositing and/or stacking of common source point data for output record and display. [A3852]

"Three and four product surface-wave acousto-optic time integrating correlators"

A method and device for processing spread-spectrum and other wideband comications and radar signals to obtain three and four product correlated signals. A laser beam is split and shaped into first and second sheet beams. The first beam is directed to a first acousto-optic medium where it is doubly diffracted by first and second signals. The second beam is directed to a second acousto-optic medium which is spatially rotated 90.degree. relative to the first acousto-optic medium where the second sheet beam is either singly diffracted by a third signal or doubly diffracted by a third signal and a fourth signal. The diffracted sheet beams are shaped into square beams, combined and directed to a photodiode area array. [A3853]

"Level gauging systems"

To measure the height of the surface of a fluent material, such as coal, in a bunker or container, pulsed radiation from a microwave source is beamed down on to said surface, and the return radiation reflected from the surface is processed to detect pulses in the waveform with time-varying amplitudes, and therefore denoting returns from the fluent material, and to reject fixed shape pulses denoting returns from the fixed structure of the bunker. To discriminate between returns of time-varying amplitude (i) from the fluent material surface and (ii) from material flowing in from an in-feed, the higher frequency components, denoting the material flowing in, are filtered out. [A3854]

"Radio frequency switch for coupling an RF source to a load"

A radio frequency switch which has input and output diodes and a quarter length impedance inverter interconnecting the diodes. A switch drive signal is clamped to a predetermined voltage between drive signals so that the impedance with respect to the input source remains substantially constant during the entire switch operation. [A3855]

"Doppler speed sensing apparatus"

A vehicle velocity sensing system is disclosed which includes a doppler velocity sensor (10, 12) and means for reducing spurious signal components in the output of the sensor. An accelerometer (30, 32) is mounted so as to sense vehicle accelerations along the boresight of the doppler velocity sensor. A processor (34, 36) processes the output of the accelerometer to provide a signal which corresponds essentially to the spurious components of the output of the doppler radar velocity sensor. A signal combiner (38, 40) combines the output of the processor with the output of the doppler velocity sensor to derive a corrected output signal which is more closely indicative of the velocity of the vehicle. [A3856]

"Device for preventing overwinding of a roller blind"

The invention relates to a slip coupling for preventing the overwinding of the motor spring of a roller blind. In one embodiment the slip coupling is incorporated as part of a bracket for supporting one end of the roller. The bracket has a cylindrical bearing which is rotatable within a circular aperture in the face of the bracket and receives a pin of the spindle of the roller so as to be rotatable therewith. The bearing carries a spring the ends of which engage with stops on the face of the bracket so that the bearing is prevented from rotation when the torque exerted by the motor spring is below a predetermined level. When the motor spring is overwound the ends of the springs are caused to flex to override the stops and so reduce the tension in the motor spring. In a second embodiment the slip coupling is located within the roller. [A3857]

"Secondary radar responders"

The invention relates to secondary radar responders which provide a reply in response to a radar signal received from a primary radar transmitter. The frequency of the received radar signal is monitored by the responder and the frequency of the response is brought into agreement therewith so that the response can be received by the primary radar transmitter at its transmission frequency. The invention is particularly applicable to marine radar systems and the responder may form part of a racon or transponder. [A3858]

"Radar system for collision avoidance"

A radar system is disclosed adapted to detect relative headings between a system-equipped craft such as aircraft and ships at sea and a detected object moving relative to the ground, the system being particularly adapted to collision avoidance application. The system includes forward and rearward radar transmitter antennas, which are carried by each equipped vehicle. Each of the radar antennas is oscillated in synchronism with the other through a 180.degree. sweep, the forward radar set transmitting a scan spectrum of directional pulses of rf radiation at incremental headings through the sweep. A narrow band pass receiver detects return or echo signals in a very narrow frequency band corresponding to doppler shifted transmission frequencies. The rear radar transmits at a constant frequency and the return signal is utilized to generate a differential frequency which is the end result of a given ground speed and antenna heading. The spectrum scan of the forward transmitter is shifted in accordance with the differential frequency in order to avoid transmitting at ground echo frequency, as well as to narrow the scanning spectrum frequency to provide a highly efficient time and energy utilization in the radar scan. [A3859]

"Apparatus for remote temperature reading"

An apparatus for remote temperature reading particularly for the reading of the temperature of an article or animal at a distance by means of an electromagnetically interrogatable label attached to or implanted in the article or animal the label being constructed to be capable of receiving an electromagnetic signal from a transmitter, converting the signal to a surface acoustic wave, passing the wave over a path on the label, reconverting the surface acoustic wave to an electromagnetic signal and retransmitting it to a receiver. The path of the surface acoustic wave is of a material such that the time of travel of the surface acoustic wave over the path is a function of the temperature of the path and thus of the label. The receiver is constructed to measure the time interval between electromagnetic signals produced by the passage of the surface acoustic wave past a transducer or transducers in the path and thereby provide an output indicative of the temperature of the environment of the label. It is preferred that the label includes a plurality of transducers at coded locations along the path arranged for retransmitting to the receiver a coded sequence of electromagnetic signals indicative of an article or animal to which the label is affixed or in which it is implanted in the manner described in U.S. Pat. No. 3,706,094. [A3860]

"Radio communication system and transmitter and receiver equipment therefor"

A system providing radio communication between a first station and at least one additional station wherein the first station is equipped to transmit an interrogation signal and also an information-bearing signal having a key signal component and an information signal component, wherein the additional station is equipped to receive the information-bearing signal and to store the information contained in the information signal component in a read/write memory only when the key signal component corresponds to a pre-selected key code, and wherein the additional station provides for the transmission of the stored information upon the reception of the interrogating signal to facilitate the reception of such information at the first station. [A3861]

"Doppler radar system"

In a Doppler radar system any one received signal contains components having different Doppler frequencies. This is because the received signal is derived from reflections off a range of different positions within the beamwidth of the system. It is often only that frequency component which is derived from a reflection along the boresight of the system which is of interest. Difficulty arises in determining which component this is. Because of variations of the reflective properties of the surface from which the reflections are received, it cannot correctly be assumed to be the strongest component. The invention identifies the components of the received signals derived from reflections along the boresight of the system by analyzing each of two signals received at different times, into components having different Doppler shifts. Values are then calculated of the relative strengths (e.g. ratios or differences) of components of the two signals derived from reflections off the same position. These relative strength values are not greatly affected by variations in the reflection properties of the surface and can be used to determine accurately the frequency components of the signals derived from the boresight. [A3862]

"MTI-Filter in a trackding radar receiver"

An MTI-filter included in the receiver part of a tracking radar for suppressing clutter when receiving echo pulses from a certain target. The transmitting pulses of the tracking radar are transmitted in series where the carrier frequency is varied from pulse to pulse and is repeated from series to series. The MTI-filter (F) contains a number of delay links (DL1-DLN) , for example digital shift registers which are stepped forward timely with the radar PRF. The input of the filter and the output of the shift register M.ltoreq.N are connected to a differentiator (SK) where M=the number of carrier frequencies in a pulse series. [A3863]

"Medium PRF pulse doppler radar having simplified ground moving target rejection capabilities"

In a single channel medium PRF pulse doppler radar receiver, the return signal data is processed to prevent sidelobe return signals from being displayed and rejects ground moving targets up to approximately 80 knots while having no high velocity blind speeds. After the returns are filtered by a doppler filter notch for rejecting returns having a velocity substantially less than the 80 knot example, the return data undergoes three stages of correlations to reject sidelobe returns, and undergoes processing including a fourth correlation which enables the third stage of correlation to output a signal only for unambiguous ranges that contain target data in excess of the 80 knot range. [A3864]

"Doppler radar mounting structure for motor vehicles"

A mounting structure of a Doppler radar vehicle speed sensor for an automobile, especially adapted for damage-free mounting of the radar to a bottom of the automobile which may detrimentally hit on the road surface while the automobile is in motion. In order to protect the radar casing from the attacks by possible flying pebbles and muddy splashes caused by the rotation of the front wheels, the radar casing containing a horn antenna or a slot array antenna is accommodated in a recess or a stepped space formed near the rear wheels in the bottom surface of the floor of the automobile in such a manner that the casing is within the partial space in the recess lying on the side opposite to the road surface with respect to a plane containing the front edge of the recess and the tangent line drawn from the front edge to the outer diameter of the front wheel. The mouth of the antenna is directed toward the rear end of the automobile. [A3865]

"Control systems for radar receivers"

An echo ranging weather radar system in which the bandwidth B of the radar receiver is made roughly equal to the bandwidth of the frequency spectrum of at least some expected weather echoes. In one embodiment, B T.sub.R is made equal to .alpha. during a time interval corresponding to a range increment at maximum range and during an earlier period corresponding to lower ranges, is varied inversely with range, where T.sub.R is the duration of an echo pulse which would be produced by a target of reference size, and .alpha. is a constant such as 1.2. In another embodiment, B is varied according to the duration T of actually received echo signals so as to set BT.congruent..alpha. during each echo reception interval, for different values of T. The gain of the receiver also may be varied with time. [A3866]

"Radar transponders"

An interrogator/transponder for identification of co-operating pulse radar-fitted marine vessels comprises a detector responsive to signals in the radar frequency band and a C-band transmitter/receiver connected such that on receiving a C-band interrogating signal together with a radar signal an identity signal produced by a signal generator is transmitted. When used for interrogation an interrogating signal is produced by a second signal generator for transmission with the radar signal and the received identity signal from the interrogated vessel is presented on a radar display adjacent to the return radar signal. [A3867]

"Signal processing system"

An improved system for processing an electrical velocity information signal in a velocity detecting system in which a detector is utilized for developing an electrical information signal, such as a Doppler signal, having a characteristic (e.g. frequency) that varies systematically with the object's velocity. A converter develops an oscillatory signal having a frequency which varies in accordance with the velocity information signal characteristic. A tracking filter having a center frequency that varies with the oscillatory signal filters all frequencies other than the center frequency. A signal generator is responsive to the frequency of the signal passed by the tracking filter for generating an output signal having a frequency which is a preset ratio relative to the center frequency, whereby the output signal of the system is relatively noise-free and has a frequency which represents the velocity of the object being detected. Another feature of the disclosed embodiment of the invention utilizes a switching network comprising a pair of flip-flops and a pair of shift registers which are responsive to the oscillatory signal passed by the tracking filter and to an oscillatory signal generated by a voltage-controlled oscillator for alternately charging and discharging a storage capacitor which is coupled to the inverting input of an operational amplifier used as a comparator. A variable resistance is placed in either the charging or discharging path and the output of the op amp is used as an error voltage to control the frequency of the VCO to thus provide a frequency locked loop. [A3868]

"Microwave movement detector"

A microwave generating and receiving module generates and transmits a microwave signal which is reflected by a moving target and received back by the module. The module comprises a disc-form Baritt diode BD1 or Gunn diode acting as both oscillator and mixer and forming part of microstrip circuitry and signal processing circuitry which processes the reflected signal to extract relevant target information. The signal processing circuitry can be physically displaced from the module and connected to it by a coaxial line. By operating the diode in the diplex mode the requisite target information can be provided for with a compact construction. [A3869]

"Scanning radar system"

A scanning radar system having the capability of taking a number of succeve looks at the same range and angle resolution cells with several millisecond time intervals between looks. The scanning radar system includes a pulsed transmitter, a receiver, and an array of energy beam radiators having individual beam paths with associated centerlines. A commutator switch and a duplexer sequentially connect a different one of the radiators to the pulsed transmitter at the beginning of each pulse repetition period and to the receiver during the subsequent interval between pulsed transmissions. A motor rotates the array of radiators as a unit to cause the beam path centerlines to rotate and scan the field of view. A plurality of delay units and a commutator switch are connected to the output of the receiver for processing the pulses returned to each of the radiators from resolution cells in the field of view during the intervals of time between pulsed transmissions to cause the pulses returned to different radiators from the same resolution cell to be in time coincidence. [A3870]

"Vehicle speed sensing apparatus with electromagnetic wave interference detector"

A vehicle speed sensing device comprises a Doppler radar unit for producing a Doppler signal related to the vehicle speed and producing a speed signal from the Doppler signal, a first section for extracting noise components in the Doppler signal and producing a noise detection signal, and a second section for producing an output signal of the vehicle sensing device. The device output is the speed signal from the Doppler radar unit when the noise detection signal is absent while the device output is null or a speed signal having an amplitude identical with that of the speed signal just before the appearance of the noise detection signal when the noise detection signal is present. [A3871]

"Sounding apparatus"

The present sounding apparatus is used for the detection and measurement of phenomena relating to the area surrounding the earth's globe. It can in particular be used in the study of the ionosphere and specifically for the study of limited amplitude, short duration modifications in the gradient of the electron density of the ionosphere. It can also be used for studying other phenomena, such as the study or monitoring of the sea swell. [A3872]

"Ground-speed Doppler radar for vehicles"

A Doppler radar wherein, in order to measure the ground speed of an automobile, microwaves are radiated to the ground and the Doppler shift of reflected waves from the ground is detected, characterized in that to the end of avoiding a malfunction ascribable to an external microwave interference, when the differentiated output of the Doppler radar is greater than a threshold value, the frequency of the microwaves of the Doppler radar is controlled so as to prevent the microwave interference from taking place. [A3873]

"Method for calibrating beam emitter type speed sensor for railroad rolling stock"

A beam emitter type speed sensor for railroad rolling stock is calibrated by positioning an endless belt between rails of the track for the railroad rolling stock. The endless belt has a speed which is controllable. The endless belt is so positioned so that the railroad rolling stock can maneuver the speed sensor in proximity thereover having an antenna-to-belt distance comparable to the antenna-to-roadbed distance. A method of calibrating the indicator in the cab includes rotating the belt at a known speed. [A3874]

"Automotive radar monitor system"

An automotive radar monitor system for monitoring an object or objects running in the front and/or in the rear, left and/or right with respect to the vehicle equipped with the system. The radar monitor system is specifically designed to provide a driver with an indication of the state of an approaching object or objects in the traffic at any given moment by way of an integrally simulated pattern which can be recognized at a glance, together with an audible indication. [A3875]

"Television weather radar system"

Information from a weather radar system (10) is gathered by a data transmitter (20) and sent to a data receiver (25) via a telephone or data line (30) . The radar video information for each radial is divided into segments and temporarily stored in a memory (45) . Only the information in those segments which are to be recorded in a random access memory (140) in the data receiver (25) are transmitted. The selection within the data transmitter (20) is made by a programmable read-only memory (95) , and the placement of the data into the receiver random access memory (140) is made by programmable read-only memories (130 and 135) . Synchronizing pulses representing each radial (102) and antenna position (14) are also transmitted. [A3876]

"FM-CW Radar system for use in an automotive vehicle"

An FM-CW type radar system, for use in an automotive vehicle, which is specifically designed with a signal processor of relatively simple construction having an improved capability of identifying an object, particularly a plurality of objects, to be identified in suurrounding traffic or road areas. The system is particularly effective in overcoming possible error in detection of the object (s) due to reflected or scattering waves from the road surface or the like as experienced in the general radar navigation system for detecting the approaching or interfering object (s) by the provision of incessant radar monitoring along with the path of travel of the vehicle equipped with the radar system so as to eventually maintain a safe relative distance and/or velocity of that vehicle with respect to the object (s) in the surrounding traffic or road areas. [A3877]

"Apparatus and method for classifying moving targets"

Method and apparatus for passive classification of moving targets which uses pulse Doppler radar wherein in addition to the primary Doppler echo the radar echo signals of the moving targets also contain periodically repeating Dopplers side line frequencies which can be utilized for classification of the targets. These Doppler side lines occur because of the periodic change of reflectivity of the target as, for example, due to rotating parts on the target and in the invention are investigated by means of spectral analysis for identification of the target. for example, land vehicles, wheeled and track vehicles can be easily distinguished with the invention and a first rough evaluation and in a fine detail evaluation, can be classified for every target type. [A3878]

"Doppler radar mounting structure for motor vehicles"

A Doppler radar speed sensor including an antenna section and a sensor section is mounted on the underside of the automobile undercarriage. A recess for accommodating the Doppler radar speed sensor is formed in part of the underside of the automobile undercarriage within a rectangle surrounded by the wheels, and the Doppler radar speed sensor is mounted fully within the recess. This structure prevents the sensor from being damaged in an unfavorable environment or external vehicle devices from being interfered with by the leakage of the unrequired radar wave. for size reduction, the Doppler radar speed sensor is provided with a metal casing integrated with a slotted waveguide antenna. The slot array of the antenna is formed in one side of the metal casing, so that the metal casing, makes up part of the slot array antenna. [A3879]

"Distance-measuring system with in-range signalling for use with cameras, alarms, and the like"

A distance measuring system generates an in-range signal when an object is located within a range of focus or a zone of protection, as the case may be. The system utilizes a single infrared transmitter and two receivers in order to determine the position of the object by triangulation. [A3880]

"Non-linear dynamic filtering device for the angular measuring of noise in a radar"

To improve the accuracy of angular measurements in a radar or sonar system by suppressing noise due to target glint, an angular-deviation signal .epsilon. derived from the output signals .SIGMA. and .DELTA. of a sum channel and a difference channel is multiplied with a gain-control signal K (t) before being subjected to recursive filtering. Signal K (t) is obtained, also by recursive filtering, from a weighting function P (t) which goes to zero during periods when the measurement of the angular deviation is unreliable as determined from a low value of sum signal .SIGMA. and from a peaking of a quadrature deviation signal .epsilon.q, function P (t) being proportional to the product .SIGMA..sup.n .multidot. (S-.vertline..epsilon.q.vertline.) where the exponent n is at least equal to 1 and S is a predetermined threshold. The recursive filter processing the deviation signal .epsilon. has two cross-connected stages, both controlled by signal K (t) , respectively emitting a corrected deviation measurement .epsilon. and an estimated time differential .tau.d.epsilon./dt, .tau. being a delay introduced in a recursive loop of each stage. Prior to being multiplied with gain-control signal K (t) , the deviation signal .epsilon. may be additively combined with an angular-orientation signal .theta..sub.r of a radar antenna to yield an angular value .theta..sub.c which can then be multiplied by a measured target distance D to provide a transverse-deviation signal d, in that case the two filter stages respectively emit a corrected deviation signal d and a target-velocity estimate v. [A3881]

"Spatially adaptive moving target indicator system for radar equipment"

A radar system is provided with first and second moving target indicator (MTI) systems. The first MTI system generally works better against ground clutter than against sky clutter. The second MTI system works well against sky clutter but generally requires a greater number of radar return echoes to discern targets in the sky clutter. A correlation estimation circuit is employed to calculate the correlation of clutter-like return echoes not suppressed by the first MTI system. If the return echoes are sufficiently correlated, the second MTI system is invoked against the clutter. If the return echoes are less well correlated, on the other hand, then electronic counter-counter measure systems may be invoked. [A3882]

"Vehicle identification system"

A vehicle identification system includes apparatus located on the vehicle for transmitting a continuous wave RF probe signal, a remote interrogator unit responsive to the probe signal for transmitting back thereto an interrogation signal. The apparatus on the vehicle transmits in response to the interrogation signal an identifying code. The probe signal may be further utilized in determining the speed of the vehicle. [A3883]

"Method and apparatus for digitally determining the speed of a target vehicle while the radar platform vehicle is in motion"

A moving doppler radar unit capable of separating the incoming doppler signal into its respective frequency components by means of frequency translation techniques and fixed frequency filters is disclosed. When the radar platform vehicle and target vehicle are both moving, the received doppler signal is a complex wave having frequency components related to the ground speed of the platform vehicle and the relative speed of the platform and target vehicles with respect to each other. Separation of the received doppler signal into its respective frequency components is accomplished by frequency translating the received doppler signal to a preselected reference frequency, discriminating between the frequency translated platform speed and target speed frequency components by means of a narrow band filter and a band pass filter, and frequency translating the separated frequency components downward to provide speed signals representative of the ground speed of the radar platform vehicle and the ground speed of the target vehicle. These speed signals are then converted into digital speed information which can be conventionally displayed. A lock detection circuit is included to inhibit the speed computation if the received doppler signal is not properly frequency translated to the reference frequency. [A3884]

"Traffic radar system"

A traffic radar system is provided in which the speed of a target vehicle is determined by measuring the difference in frequency between a component of a doppler signal which has a frequency proportional to the relative speed of the target vehicle and a moving patrol vehicle and a reference signal having a frequency proportional to the speed of the patrol vehicle. The reference signal is developed from a tachometer device which generates a periodic signal having a frequency proportional to the rotational speed of a vehicle wheel and phase-locked loop arrangements including adjustable dividers are provided for locking an oscillator to the tachometer signal and generating a reference signal at a frequency proportional to the actual speed of the patrol vehicle. for calibration, a component of the doppler signal produced from reflections from stationary objects is used. [A3885]

"Device for distance acquisition in a radar system"

A device for distance acquisition in a radar system, especially a tracking system, comprises a surveillance radar with a mobile directional antenna whose direction is known at each instant, a tracking unit whose line of sight is also known at each instant, and a video extractor. The device further comprises means for detecting the coincidence of the direction of the surveillance antenna with the direction of the line of sight of the tracking unit as well as means for permitting measurement of the distance of a tracked echo-emitting target by the surveillance signals at the time of such coincidence. [A3886]

"Profilometer mounting technique and apparatus"

Apparatus for measuring the contour of a surface without establishing contact therewith includes an energy transmitter movable in at least two directions. When employed in a shaft furnace the transmitter is movable along a longitudinal axis, so as to be either retracted to a protected location where it may be isolated from the furnace environment or extended so as to enable measurements, and is rotatable about the longitudinal axis so that the transmitted energy may be scanned across the surface. [A3887]

"Pulsed microwave motion sensor for intrusion detection applications"

An intrusion detection apparatus including a sensor for sensing an objectionable interference phenomenon within a detection area and developing a pulse train coincident therewith, signal processing circuitry responsive to the pulse train and operation to actuate a Gunn diode microwave generator or the like in a pulsed manner causing it to transmit microwave energy into the detection area in synchronism with the interference phenomenon, a microwave receiver for detecting microwave energy reflected from the detection area and for developing detection signals indicating motion within the monitored area, and further signal processing circuitry responsive to the detection signal and operative to actuate an alarm or the like. [A3888]

"Three dimensional, azimuth-correcting mapping radar"

A terrain mapping radar utilizes two sets of separately processed radar signals, each provided by a coherent pulse doppler synthetic aperture signal processing channel connected to and for processing the signals received from a selected one of a pair of vertically displaced antennas of the type utilized in phase interferometer radars. The invention provides depression angle, and therefore elevation information from the processed signals on a cell by cell basis, uniquely, for each range/doppler cell of each of the processing channels. The invention eliminates azimuthal errors which result from the ambiguity of the range/doppler annulus, and provides a useful map metric: elevation. [A3889]

"Minimizing harmonic distortion apparatus"

An apparatus is provided to minimize harmonic distortion in a microwave circuit which is used with a velocity measuring system. The apparatus is particularly applicable where at least two Doppler signals are generated at substantially the same time from two different targets whose velocity is being measured. The apparatus includes a microwave circuit which transmits a microwave energy signal directed to each of the targets. The microwave circuit also receives the signals reflected by the targets and produces Doppler signals. A control circuit responds to the Doppler signals outputted by the microwave circuit by providing a control signal corresponding to the greatest in amplitude of the Doppler signals. The control signal is fed back to the microwave circuit to control the Doppler signals so that a predetermined amplitude thereof is not exceeded and, as a consequence, harmonics of the Doppler signals are not generated. [A3890]

"Target vehicle tracking apparatus"

Vehicle tracking and position predicting apparatus includes an improved Kalman velocity filter feedback loop having a forward gain matrix for loop coordinate error factors and those of their derivatives, and position predicting computing apparatus in the loop feedback path between the system output and an input error node. Sensor reference target signals (e.g., range, bearing and elevation) are connected as inputs to the filter error node. In accordance with one aspect of the present invention, sensor coordinate reference errors from the input error node are converted to target reference coordinates. Pursuant to a further aspect of the present invention, the gain matrix is varied dependent upon sensor coordinate variables. Gain matrix variations are thus independent of geometry and sensor reference coordinates. [A3891]

"Doppler signal processing apparatus"

A doppler type speed sensor produces a doppler signal having a spectrum of frequencies including a frequency of peak amplitude corresponding to the actual speed of an object. The frequencies are supplied to a narrowband voltage tunable filter, the frequency bandwidth of which is continuously adjusted by a periodically reoccurring sweep signal applied thereto. The output of the filter is coupled to a peak detecting circuit which produces a pulse when the maximum amplitude signal is received thereat. The sweep signal and pulse are applied to the inputs of a sample-and-hold circuit to cause the sample-and-hold circuit to hold and produce a signal corresponding to the value of the peak frequency and therefore the speed of the object. [A3892]

"Short-range doppler radar"

In a Doppler radar system for measuring the velocity of a vehicle, such as an automobile, in order to lessen interference with external electric wave appliances, such as radios and televisions, caused by transmitting microwaves, one of the higher harmonics generated from a mixer diode driven by the fundamental waves of a local oscillator is selected by a filter for transmission and is used as the transmission output wave, whereby the power of the transmission waves is remarkably reduced in comparison with the mixer driving power. [A3893]

"Automatic ground clutter rejection in weather pulse radar system"

In a weather radar system wherein echo signals are linear-detected from the waves received at the radar, each one of echo signals being compared with the later one to derive AC component, and the mean power of the weather echo estimated from the power of the AC component, the linear-detected echo signals are amplitude suppressed before compared. The amplitude suppression effectively removes the errors due to the fluctuation of ground clutter, and the variation of AC power of weather echo due to the existence of ground clutter. An amplitude suppressor is used which has an amplitude suppressing property expressed by Y=X.sup.k, where X is an amplitude of the input signal, Y is an amplitude of the output signal, and k is a constant (0< k< 1) . The value of k is advantageously 0.3-0.9, and, more advantageously 0.6-0.7. If the echo signals are obtained in a form of a logarithmic signal, an amplitude suppressor which has an input-output characteristic expressed by, for example, Y=10.sup.kZ/20 (Z: amplitude of input signal, Y: amplitude of output signal) can be used. [A3894]

"Clutter filter using a minimum number of radar pulses"

A clutter filter which reduces by (N-1) the number of input pulses required or operation of an N-pulse MTI canceler when L>,N consecutive filtered outputs are desired. The clutter filter includes the two channels of an N-pulse MTI canceler which weight and sum the in-phase and quadrature-phase components of N radar returns, and a pair of delay circuits which introduce a delay of N interpulse time periods to the N and subsequent in-phase and quadrature-phase components of the radar returns. The stored outputs of the two channels of the canceler and the consecutive outputs of the delay circuits are combined in a complex multiplier to generate the consecutive in-phase and quadrature-phase outputs of the filter. The clutter filter has utility in a multiple-stage filter system employing a Doppler filter as the last stage. [A3895]

"Cross correlated doppler radar/infra red velocity and presence sensor"

A doppler radar and infra red sensor focused by common means onto a region, will, with appropriate cross correlation, provide improved velocity and presence sensing in a complex uncontrolled environment. The illustrative overhead, roadside traffic sensor employs a common microwave/infra red parabolic reflector and illuminating feed. The sensor can be conveniently mounted onto utility poles without cutting up the road or hanging overhead arbors. The velocity and presence data it provides can be used to determine vehicular headway, density, volume, vehicle size, aggregate momentum, aggregate congestion, platoon arrival, queue length, etc. This novel sensor reduces spurious indications, permits oblique angle viewing of vehicles, reduces doppler transmitter power levels so as to be well below normally accepted environmentally safe levels, and discriminates against vehicles moving in the wrong direction. The improved information will make possible better adaptive traffic signal timing methods to reduce fuel consumption and auto emissions. An additional feature provided by this sensor is that it detects emergency and mass transit vehicles to expedite their safe movement. [A3896]

"Doppler radar vehicle speed sensing system including means for checking system operation based on the detection of low frequency Doppler frequency components"

A vehicle speed sensing apparatus with means for checking its operation comprises a Doppler radar unit for producing a Doppler signal related to a vehicle speed and producing a speed signal from the Doppler signal, a first section for extracting low frequency components in the Doppler signal and a second section connected with the first section for producing an operation check signal. The extracted low frequency components correspond to vertical motion of the vehicle and are considerably lower than a Doppler signal frequency which corresponds to a minimum vehicle speed. If these low frequency components corresponding to vertical motion are not present, it is an indication that the speed sensing system is not operating properly. [A3897]

"Navigational systems using phase encoded angular coordinates"

This invention generally relates to navigation systems which seek to position in real time with appropriate accuracy one or more mobile platforms in reference to a known system of coordinates by the emission of signals into a propagation medium and processing them after detection. Broad-band, broad-beam signals are employed. All received signals convey phase encoded angular coordinate information which characterizes the particular signal path. When the angular coordinate information is used in conjunction with range determinations from detected signals, an especially useful navigation system is provided which can operate using only a single reference station. [A3898]

"Microwave proximity sensor"

An improved microwave proximity sensor including 1/4-wavelength folded dipole antenna performing the functions of a transmitting antenna, a receiving antenna, and a frequency determining element in a microwave oscillator. [A3899]

"Collision avoidance apparatus"

Collision avoidance apparatus for assessing manoeuvres of a first vehicle (6) to avoid collision with other vehicles (22) in which closed regions are computed respectively associated with the other vehicles and which, if avoided by the first vehicle, will assure that the latter will not pass closer to the other vehicles than a predetermined distance (CPA) . The periphery of each of said regions is defined by lines joining the following points: the point (49) at which the first vehicle (6) would be at said predetermined distance (CPA) from the other vehicle (22) in question when on a heading to cause the other vehicle (22) to pass ahead (ahead CPA joint) , the possible point (51) of collision (PPC) of the first vehicle (6) and the other vehicle (22) based on the present speeds of the two vehicles and the present heading of the other vehicle, the point (52) at which the first vehicle (6) would be at said predetermined distance (CPA) from the other vehicle (22) in question when on a heading to cause the other vehicle to pass astern (astern CPA point) , and the points of intersection (56,57) of a line parallel to the heading of the other vehicle (22) , and spaced from it by said predetermined distance (CPA on the side nearest to the first vehicle (6) , with said astern and ahead headings of the first vehicle (6) . [A3900]

"Anti-collision vehicular radar system"

The present invention includes an anti-collision vehicular radar system which incorporates a microprocessor. The system provides a warning of a potential collision of the vehicle with other vehicles or objects in the path of the vehicle and automatic braking. More particularly, the present invention utilizes a pulsed radar system with overlapped antenna beams for off-axis object discrimination which determines the pattern of the change in relative velocity of the vehicle and the object which is detected by its radar to provide signals which are processed by a microprocessor and associated digital circuitry to determine whether the detected object is a potential obstruction which must be avoided by braking or maneuvering of the vehicle. [A3901]

"Method utilizing electromagnetic wave pulses for determining the locations of boundary surfaces of underground mineral deposits"

The locations of compositional discontinuities in salt deposits and the like are determined by measuring the travel time of electromagnetic waves reflected off of boundary surfaces between underground geological regions of differing mineralogical characteristics. A spark transmitter is used to generate pulses each composed of a plurality of cycles of electromagnetic waves. The electromagnetic waves have a frequency between 1 and 500 MHz. The pulses have a pulse duration of 0.1 to 1 microsecond and a pulse repetition frequency of 10 to 1000 Hz. The thusly generated pulses of electromagnetic waves are radiated into the solid body of a mountain or other geological structure from within the interior of an underground excavation, so that the transmitted radiation will be reflected back from one or more boundary surfaces with different respective travel times. The reflected-back radiation is received and recorded. The travel times are measured, in order to determine the locations of the boundary surfaces. [A3902]

"Ranging radar including a modulating reflector"

A ranging radar of the radio frequency (RF) frequency modulated-continuous wave (FM-CW) type transmits an RF FM-CW signal to a reflecting surface at an unknown range R from the radar. The reflecting surface reflects the signal to a modulating device. The modulating device further modulates the signal at a frequency F which is high in comparison to the modulating frequency of the FM-CW signal. The further modulated signal is transmitted by the device to the reflecting surface and back to the ranging radar where it is subtractively mixed with a sample of a transmitted signal. The mixed signal is at frequency F amplitude modulated by a beat frequency, the period of which corresponds to range R. The frequency F is removed from the mixed signal leaving the beat frequency signal from which is determined range R. [A3903]

"Radar system for determining range and speed of an object"

A system for determining the range H to an object and the relative velocity v of the object, including means for generating first and second high-frequency signals, transmitting, receiving and mixing the received high-frequency signal with the high-frequency signal transmitted for generating first and second beat signals, and an arithmetic unit determining in an iterative manner from the point at which one of the two beat frequencies has the lowest value, the value of H and the value of v. [A3904]

"Station watch alarm system"

A system which cooperates with a conventional radar system produces an alarm upon departure of a reference target from a predetermined area relative to a vessel as an indication of vessel drift from anchor or assigned station by the use of a variable range gate and a variable azimuth gate together with discriminating and timing or counting means. [A3905]

"Warning system for traffic routes at an avalanche danger hillside"

A warning system for traffic routes at an avalanche danger hillside is provided wherein the hillside ground is divided in an assumed avalanche falling direction, thus into a series of areas which are e.g. about 30 meters wide. These areas each have at least one associated indication device with an electronic signal output, and the signals of the indication device are fed to a memory which, for a downhill correct sequence of the signals, energizes an avalanche alarm and releases the alarm when, by virtue of the stored experience data, there is no longer a risk below the avalanche area. The indication devices receive an electronic signal output of a receiver for the reflected waves of at least one radar transmitter, and these signals from the indication device are fed to an electronic logic circuit which, for a downhill correct sequence of the signals energizes and releases an avalanche alarm in accordance with the snow movement on the hillside. [A3906]

"Method and apparatus for measuring distances"

Measurement of distance is carried out by transmitting a VHF wave train crising a sinusoidal signal modulated by phase inversion in accordance with a pseudo-random sequence, at a receiver shifting a like second sequence until it coincides with the received sequence, re-transmitting a signal modulated by the second sequence, receiving the second sequence and shifting a like third sequence until it coincides with the received second sequence, and measuring the phase shift between the third sequence and a like reference sequence. [A3907]

"P-I-N type diode high frequency switch for secondary radar interrogation devices and transponders"

A P-I-N type diode high frequency switch in a secondary radar interrogation device working with ISLS and RSLS and consisting of a transmitter, two receivers and two antennas. So as to reduce the high cost for P-I-N type diodes, including driver stages for the transmission and reception separation and to eliminate the necessity of an antenna switching unit, the terminals 19 and 20 of a pair of antennas are directly connected through single lines 23 and 24 to band pass filters 5 and 6 connected to respective receivers 7 and 8 with the band pass filters 5 and 6 blocking the transmission signal and allowing reception of received signals and wherein the electrical lengths of the line and the band pass filter is such that the input impedance corresponding to no-load operation occurs at the corresponding antenna terminal for the transmission frequency. The invention can be used in secondary radar transponders operating with two antenna diversity and the high frequency switch of the invention can be used in both civil secondary radar interrogation devices as well as military IFF interrogation devices as, for example, in ground stations. [A3908]

"Traffic radar unit"

A one-piece traffic radar unit has a housing containing both the transceiver and signal processing circuitry and the directional antenna of the radar system. A bracket plate extends from the top portion of the housing and overlies the dashboard of the patrol vehicle to mount the unit therein with the housing depending from the bracket plate in front of the dashboard, thereby leaving the driver's view through the windshield unobstructed. The antenna is of the conical horn type and is vertically disposed to beam the transmitted signal up through the housing to a rotary reflector mounted on the top of the housing. The reflector is rotatable about a vertical axis and permits the operator to aim the beam in any horizontal direction through the windshield or a window of the vehicle. A special safety mount for the reflector provides for 360.degree. rotation and also permits the reflector to break away from the housing on impact. The housing is specially shaped in that the front panel thereof, containing the controls and readout, is positioned obliquely with respect to the fore-and-aft axis of the vehicle to face the panel generally toward the driver and provide a convenient reading angle. [A3909]

"Digital CFAR signal processor for phase coded radars"

Use of multi-bit digital arctangent function-generator to remove noise-clutter amplitude-modulation from in-phase and quadrature phase multi-bit successive samples of MTI canceller outputs and n-bit running correlation of digitized samples with serial phase code, result in increasing effective CFAR sensitivity of radar receiver. [A3910]

"Surface acoustic wave time chirp devices"

Surface acoustic wave dispersive delay lines provide a chirp signal generator and filter capable of producing signals of which the frequency-time slope can be varied. The chirp signal generator includes two surface acoustic wave delay lines, means for impulsing the delay lines with a variable relative time delay, and a mixer for combining the outputs of the two delay lines. The variable dispersion filter includes two delay lines, means for impulsing the delay lines with a variable relative time delay, a first mixer for combining an input signal with the output of one delay line and a second mixer for combining the output of the first mixer with the output of the other delay line. Variation in the time delay between the impulsing of the two delay lines produces a variation in the chirp rate at the output signal. The amplitude frequency characteristics of the signal generator and filter may be made non-linear by amplitude weighting one delay line. [A3911]

"Automatic vehicle identification system and method"

An automatic vehicle identification system for use in identifying and routing vehicles, such as railway cars or other vehicles which routinely travel a given track or path. A passive electronic device or electrical circuit is employed to intersect an energy field and respond thereto by generating a code in accordance with energy received and converted to coded electrical signals. Connected to the passive device is a short wave transmitter for transmitting signals generated by the electrical device when so energized. The electrical device may also comprise a plurality of different induction coils or antenna which serve to modify an energy field in a given manner, which modification may be detected by short wave sensing and converted to a coded electrical signal which is employed to identify the vehicle. In another form, a coded array of antenna or induction coils, is provided which modify energy fields generated at check points or scanning locations along a trackway or roadway, wherein such energy field modifications are sensed at each such scanning location, resulting in the generation of an electrical code at each location and identification of the vehicle. [A3912]

"Moving object detecting device"

A moving object detecting device employing a pair of Doppler signals as a pair of vector signals of respective received-wave signals representing momentary reflected waves from a moving object. These vector signals are processed to obtain signals denoting in which ones of predetermined zones for the vector rotation depending on the movements of the object the vector is momentarily present, and shifting states of such zone signals through the zones are traced to sequentially determine the direction and period of the vector rotation and to actuate an alarm or the like when the rotation is in a fixed direction. [A3913]

"Method for shaping and aiming narrow beams"

A method and apparatus is disclosed for use of a linear frequency chirp in a transmitter/receiver (14/16) having a correlator to synthesize a narrow beamwidth pattern from otherwise broadbeam transducers when there is relative velocity between the transmitter/receiver (14/16) and the target. The chirp is so produced in a generator (20) in bandwidth, B, and time, T, as to produce a time-bandwidth product, TB, that is increased for a narrower angle. A replica of the chirp produced in a generator (26) is time delayed and Doppler shifted for use as a reference in receiver (16) for correlation of received chirps from targets. This reference is Doppler shifted to select targets preferentially, thereby to not only synthesize a narrow beam but also aim the beam in azimuth and elevation. [A3914]

"Ranging quadrature doppler microwave intrusion alarm system"

Movement of an object (intruder) in a specified area is sensed by transmitting microwave energy from an antenna (10) that also receives energy reflected from the intruder, where the received energy is quadrature processed using Doppler techniques. Connected to the antenna (10) is a transceiver (12) that includes a quadrature mixer (48) coupled to an RF oscillator (50) through an RF switch (52) . The RF switch (52) is controlled by a switch driver (54) to provide pulse energy from the antenna (10) . Doppler outputs E.sub.1 and E.sub.2 from transceiver (12) are processed in the same manner except for a 90-degree phase lead applied to the Doppler output E.sub.2 by a phase lead network (18) . Doppler outputs E.sub.1 and E.sub.2 (E.sub.2 90-degree phase shifted) are applied simultaneously to a sum and signature processor (24) and to a difference and signature processor (22) . The sum and signature processor provides the "approach" receiving signal and processes the signature to further reduce the nuisance alarm rates. The difference and signature processor (22) provides the "recede" receiving signal and similarly processes the signature to reduce nuisance alarms. Outputs of the processors (22) and (24) are respectively applied to rectifiers (32) and (28) and to integrators (34) and (30) which are similar in design and serve to rectify, amplify and filter the inputs applied thereto. A voltage comparator (36) responds to the output of the integrators (34) and (30) to trigger an alarm (38) when the voltage difference between the outputs of the integrators reaches a predetermined magnitude. [A3915]

"Doppler-type projectile velocity measurement and communication apparatus, and method"

Projectile velocity measurement and communication apparatus comprises a microwave probe fixed to a projectile barrel near a muzzle end. An oscillator, having a reference frequency selected for exciting a fundamental electromagnetic mode in the barrel, is connected to the probe through a hybrid mixer configured for extracting, from moving projectile-reflected microwaves, a true Doppler signal having a varying frequency related to projectile barrel velocity. A processor, connected for receiving the Doppler signal, measures, by a clock oscillator, Doppler signal periods (half periods) . A data presorter in the processor selects a last "N" number of period measurements before the projectile reaches an interference position relative to the probe, to be fed to a fire control computer interface for determination therein of projectile barrel and muzzle velocities, calibration means being provided to update barrel diameter values used in such determination. An alternative, dual reference frequency variation is described, in which a dual hybrid mixer provides two independent Doppler signals, to eliminate dependency of projectile velocity determinations on barrel diameter. A reference frequency modulator and control means therefor are provided to enable microwave communication of information to the projectile, for example, of projectile target time of flight for fusing purposes. Corresponding methods for projectile velocity measurement and communication are provided. [A3916]

"Navigation-monitoring apparatus"

A navigation-monitoring apparatus comprises a fixed ground station sending forth an interrogation signal to a ship and a transponder carried on the ship and transmitting a reply signal to the fixed ground station in response to the interrogation signal. A microwave sensor carried on the ship measures the distance between the ship and the nearest bank. Data on the measured distance is added to a reply signal sent forth from the ship to the fixed ground station. The fixed ground station measures an interval between a point of time at which the interrogation signal was issued and a point of time at which a reply signal from the ship was received, thereby defining the position of the ship from said time interval and data on the ship-to-bank distance. [A3917]

"Microwave speed meter"

A meter for measuring the relative velocity of an object, including a diplexer for illuminating the object with a beam of microwave energy and for developing from energy reflected from the object a difference signal having a frequency which is proportional to the relative velocity of the object, a phase-locked loop for synchronizing the frequency of an internal oscillator with that of the difference signal and for developing a lock signal when synchronization is achieved, a lock detector and timer and a timer for developing a reset signal from the lock signal, a predetermined period after synchronization is achieved and for developing a latch signal a predetermined period thereafter, a circuit for counting the cycles of the internal oscillator which are developed after the occurrence of the reset signal until the occurrence of the latch signal to develop a sum signal indicative of the relative velocity of the object, and a circuit for displaying the sum signal. [A3918]

"Detector for doppler device"

A doppler detector for measuring the speed and/or the direction of a moving body utilizing the principle of the doppler effect that the reflected frequency from a moving body is slightly changed has been found. The present doppler detector comprises a rectangular waveguide inserted between a microwave oscillator and an antenna, an elongated ferri-magnetic body inserted between a pair of H planes of said waveguide, and said body being magnetized in the axial direction of the same, and a pair of diodes each inserted between H planes of said waveguide so that the first diode being symmetrical with the second diode concerning the lateral plane including the center axis of said ferri-magnetic body. [A3919]

"Swept frequency radar system employing phaseless averaging"

Described herein is a microwave radar system which employs heterodyned swept frequency at approximately two millisecond sweep intervals. The power source is a reliable solid state, low power device such as a Gunn diode. The heterodyned difference frequency signals are converted to digital form, transformed into the frequency domain by means of a Fourier power transform, and then averaged by computer processing. Performing the Fourier power transform before averaging enables the processing of quasi-incoherent data whereby signal-to-noise ratio improvement is a function of the square root of the average number of samples taken. High-speed processing is used to off-set the loss of statistical averaging of phase-coherent data which cannot be preserved because of target motion. Thus, the sequence of the power transform allows phase-less averaging over the entire collection period. Complementary elements including signal isolation and stability, through interdependent design features of the antenna and circulator, permit the use of low-power CW radar which minimizes danger to ecology and human safety. Thus, the invention has particular applicability to the analysis of clouds, the extraction of range and thickness data of clouds, and the presence and velocity of rainfall. The invention can be used for point targets as well. Algorithms are built into the computer to compensate for various factors such as wind, temperature, and the nature of scattering nuclei. [A3920]

"Washbox with conveyor discharge"

A washbox comprising a vessel divided into a stratification compartment and an adjacent reject compartment, a perforate grid plate extending across upper parts of the compartments. First pulsation means activates the water in the stratification compartment, and second pulsation means activates the water in the reject compartment separately and in isolation from the stratification compartment. A divider is mounted above the part of the grid plate which extends over the reject compartment, an upper surface of the divider defining a first outlet channel by which material of a lower density may pass from the washbox, whilst a lower surface of the divider, together with the said part of the grid plate which extends over the reject compartment, defines a second outlet channel along which material of higher density may pass from the washbox. Adjacent to the reject compartment is a reject extraction chamber, which is not in under water communication with the pulsations applied to the two adjacent compartments and which is open upwardly to atmosphere. A first conveyor means extends through the reject extraction chamber, which is adapted to convey that reject material which passes through the second outlet channel into the reject extraction chamber from the washbox. A separate, second conveyor means is mounted on the washbox for conveying from the washbox that reject material having fallen through the apertures in the grid plate towards the bottom of the washbox. [A3921]

"Apparatus for identifying objects and persons"

A system for identifying persons and objects includes an information carrier adapted to be secured to an object to be identified, and a read unit coupled to the information carrier by means of electromagnetic waves. The information carrier incorporates a plurality of passive elements interconnected with a receive-transmit antenna system so that an interrogation signal is processed and retransmitted as a unique signature of the information carrier. The passive elements of the information carrier include delay elements, attentuation elements, and filters, interconnected in a plurality of parallel paths to generate the identifying signature. [A3922]

"Collision avoidance system using short pulse signal reflectometry"

A collision avoidance system for rapid transit vehicles employing baseband radar principles in which signals with duration in the order of nanoseconds are transmitted down track along a surface wave transmission line. Reflections from a passive target located on the preceding vehicle are processed to establish the distance between the vehicles to within an accuracy previously unachievable. [A3923]

"Apparatus for eliminating blind velocities in MTI radars"

A system and method for reducing the blind velocity problems in MTI coherent pulsed Doppler radar systems comprising an agile local oscillator which is preprogrammed to operate sequentially at more than one frequency unitl a target of interest is acquired. [A3924]

"Following distance measuring communication system"

A following distance measuring communication system comprising a transmitter and a receiver which are mounted on the front part of a following automotive vehicle, a time measuring unit connected to the transmitter and the receiver provided on the following automobile, and an answering transmitter-receiver unit mounted on the rear part of a preceeding vehicle. A pulse modulated signal is transmitted from the transmitter on the following vehicle, and this signal is received by the answering transmitter-receiver unit on the preceeding vehicle. At the instant that the signal is received, the answering transmitter-receiver unit on the preceeding vehicle generates a reply signal which is in turn received by the receiver on the following vehicle. The time required for this process is measured by the time measuring unit connected to the following vehicle receiver to determine the distance between the following vehicle and the preceeding vehicle. [A3925]

"Stratifier discharge control"

A wash box for separating materials produced in, for example a mining operation, into fractions of different densities. The machine is divided vertically into compartments, including at least one stratification compartment and at least one reject compartment, the raw material being delivered onto the grid, the level of water in the compartments being higher than the grid. Vertical pulsations are applied to the water in the compartments, causing the water to travel through the perforations of the grid. The pulsations applied to the stratification compartment are effective to stratify the material on the grid, movement of the water through the wash-box tending to carry the lighter fraction from the wash-box while the pulsations applied to the reject compartment determine the rate at which the heavier fraction reject material falls from the grid plate into a reject extraction chamber adjacent to the reject compartment. The pressure produced in the stratification compartment upon the application thereto of each stratifying pulse, and which is dependant upon the quantity of the heavier fraction on the grid over the stratification compartment, is measured by sensing means, and this measurement is used to control the amplitude of the pulsations applied to the reject compartment. Valves applying the pulsations to the stratification and reject compartments are driven by a common drive means, and the frequency at which the pulsations are applied to the reject compartment is higher than, preferably at integral multiple of, the frequency at which pulsations are applied to the stratification compartment. In this manner, the maximum rate of which reject material may be removed from the grid may be considerably extended and, by a finer control of the amplitude of the pulsations applied to the reject compartment, this may be achieved without any significant reduction in the efficiency of separation. [A3926]

"Method and apparatus for detecting and measuring inclusions in subsoil"

A method and apparatus is described comprising a transmitter for transmitting an unmodulated carrier of selected wave length into the ground and a receiver adapted to receive reflected signals. Circuitry is described for producing narrow pulses from the transmitted and received signals for displaying them on an oscilloscope and on a plotter. The display on the oscilloscope is rotated through 90.degree. from the conventional display so that the pulses corresponding to the transmitted and reflected signals appear as horizontal bars spaced apart vertically by distances which correspond to the depth of the inclusions below the surface. The wave length is selected to be at least four times the anticipated depth of the inclusions. The apparatus is described as being incorporated into a motor vehicle such as a Land Rover with the transmitting antenna mounted at the front and the receiving antenna at the rear of the vehicle. The apparatus is most conveniently situated in place of the co-driver's seat for operation by an operator sitting in the rear of the vehicle. Decoupling between transmitting and receiving antennae is partially achieved due to the rotation through 90.degree. of the polarity of the reflected wave relative to the transmitted wave. [A3927]

"Signal processor"

A signal processor having a plurality of charge transfer devices adapted for coupling to an input signal source. Each one of such devices produces a sample of the input signal in response to a sampling signal. An input shift register having a plurality of serially coupled stages is provided, each one of such stages being coupled to a corresponding one of the charge transfer devices. Circuitry is included for enabling the sampling signal to be sequentially produced at an output of each one of the serially coupled stages, enabling sequential samples of the input signal to be produced in corresponding ones of the charge transfer devices. [A3928]

"Device for registration of objects"

Devices for registration of an object and its movements in relation to another object by means of a high frequency signal transmitted from one of the objects and reflected from the other object, the reflected signal being modulated with an identification code and received back at the first mentioned object where the registration of the code takes place. To separate the reflected signal, from the first transmitted signal the frequency of the reflected signal is changed at the same time as it is reflected, the frequency change of the reflected signal being made in a way which allows the frequency of the reflected signal to be chosen according to wish, and that the frequency of the reflected signal is not equal to any of the stronger harmonic of the fundamental frequency of the first, originally transmitted signal. Thereby the reflected signal can be properly received and detected even though much weaker than the transmitted signal or any of its harmonics. [A3929]

"Delay line digital code detector"

Digital codes, each of which is comprised of a series of equally spaced pulse positions bracketed by framing pulses are passed through a delay line having a plurality of taps. The taps are connected in a gating structure which extracts only valid codes and suppresses garbled and phantom codes. [A3930]

"Target detection device"

A target detection device which functions a warhead at a predetermined het above the surface of the earth. A frequency modulated, pseudo-noise coded signal reflects from the surface of the earth to provide Doppler signals to a dual gate Doppler amplifier system. The voltage outputs of the two gates are compared, and a signal is sent to a threshold circuit to ascertain when a predetermined relationship exists between the two voltage outputs to decide when the target detection device is at a predetermined height, at which time a trigger signal actuates a time delay circuit using the Doppler frequency to generate a time delay that is dependent upon the vertical velocity of the target detection device. After the time delay, a signal is sent to a firing circuit which produces a firing pulse to function the warhead. [A3931]

"Traffic radar device"

A traffic radar device has a microprocessor controlled system for facilitating the Doppler signal processing. Related circuits enable the Doppler signal to be gathered on a digital basis and arrayed in the memory of the microprocessor unit. The array is then examined and by executing a predetermined algorithm, a decision is made as to whether or not a series of samples of Doppler signals, comprises within the array, represents a valid signal suitable for display as a number indicative of speed of a target vehicle. The microprocessor also controls a tracking filter system over the expected Doppler frequency range and has a duty factor modulation and tunable notch to facilitate the filter operation. The radar device includes a range control that limits the range of the detection of the target vehicle without affecting the detection of the platform vehicle speed. A hold mode is provided with respect to the radar device so that radiated RF energy is controlled to decrease the probability of detection by a traffic radar detector. The radar device is also capable of converting from one unit of measure to another without modification of the associated time base. As a further check on accuracy, the device includes the ability to determine the calibration of the time base within the radar system and to control the display based on the time base calibration. High speed lock onto a target vehicle speed is also provided along with the unique "power-on" calibration sequence. x [A3932]

"Speed control apparatus and method for railroad car retarders"

An acceleration servo control system for railroad car retarders in which a computed desired instantaneous deceleration signal and a measured actual deceleration signal are compared and any resulting error signal is fed back through the servo network to adjust retarder braking pressures to achieve and/or hold the desired deceleration rate which will allow the cut of cars to leave the retarder at a selected speed. The desired instantaneous deceleration is computed using an algorithm incorporating actual measured speed, the selected exit speed, the number of axles in the retarder, and the remaining distance-to-go for all axles of the cut over which retarder braking will be effective, and based on the principle of braking each axle-wheel unit throughout the entire retarder length. [A3933]

"Method and apparatus for measurement of the contents of a bunker or silo"

To measure the contents of a bunker or silo a transmitter mounted over the bunker beams down on to the contents surface a very high frequency signal that is caused repeatedly to rise and fall in frequency with either a constant sweep time and a progressively varying amplitude of frequency change or a constant amplitude and a progressively varying sweep time. The reflected target return signals are mixed with the transmitted signal to obtain a beat frequency which is filtered and processed to derive a signal representative of the range of the target, i.e. the contents surface, below the transmitter. To discriminate against target returns from fixed parts of the bunker structure, such as support members, a control unit is provided with a memory store into which are preloaded signals representative of fixed structure returns. The target returns received when the apparatus is in operation are then compared with the stored signals and any that are the same as stored signals are rejected. The control unit may also include a processor capable of distinguishing between returns from fixed targets and returns from a target moving toward or away from the transmitter. [A3934]

"Dynamic digital time interval discriminator and method"

Circuitry for indicating the occurrence of a predetermined separation time between adjacent pairs of pulses in a sequence of pulses including a first counter having a first relatively high frequency clock signal applied thereto and the sequence of pulses applied to reset the counter for each pulse, a second counter having a relatively low frequency clock signal applied thereto with the second counter counting the total number of cycles from an initial or starting time, and comparators for comparing the number of cycles in the first counter to the number of cycles in the second counter and providing output signals when the comparison indicates that the separation time between adjacent pairs of pulses is within a predetermined range. [A3935]

"Range detector"

A doppler range detector with early and late range gates responding to radar returns or either side of maximum velocity range and supplying a peak output amplitude when the early and late gates have the same doppler frequency. A peak detector is used to detect slant range with a dual pulse ranging system. The returns are supplied to two zero beat mixers, the output signals of which are passed through separate bandpass filters to a multiplier. The multiplier output is supplied through a low pass filter to the peak detector. [A3936]

"Radar speedometer"

Method and apparatus for measuring the speed of a land vehicle over a surface. A narrow beam of RF energy is directed toward the surface at a substantial angle. Reflected RF energy is mixed with that transmitted to produce Doppler signals having a spectrum. The spectra of the Doppler signals are normalized by the Doppler signals being applied to an AGC circuit so that the maximum amplitudes of the spectra are substantially constant and being applied to one or more tracking band pass filters which eliminate unwanted frequency components in the spectra. From the normalized spectra, output signals are produced from which can be determined the speed of the vehicle relative to the surface. [A3937]

"Radar clutter suppressor"

This disclosure describes a radar clutter suppressor and target classifier that compares two or more video signals. Various signal conditioning and processing means are used for enhancing echo differences between targets and clutter caused by differences in polarization, carrier frequency, pulse length, antenna beamwidth, and antenna pointing direction. Signals are processed as if due to targets if the ratio of the video amplitudes are within a band of ratios and signals are suppressed as if due to clutter if the ratios are not within the band of ratios designated for targets. The invention includes methods for suppressing clutter caused by rain, land and sea. [A3938]

"Ranging system and method for determining the range of a vehicle from a plurality of reference points"

Systems and methods for determining the range from a vehicle to a plurality of reference points. In one system a mobile transceiver is located on the vehicle for transmitting a ranging interrogation signal pulse modulated on an RF carrier having a given frequency in response to a timing pulse and for receiving ranging response signal pulses modulated on RF carriers having the given frequency. A plurality of reference transponders are individually located at each of the plurality of reference points for receiving the timing pulse and the ranging interrogation signal pulse on a carrier having the given frequency and for responding thereto by transmitting a ranging response signal pulse on a carrier having the given frequency during an interval that is discrete from the intervals during which ranging response signal pulses are transmitted from the other reference transponders. Within a given time slot in relation to the timing pulse, a single ranging interrogation signal pulse is followed by a sequence of discrete ranging response signal pulses. A data processor determines and processes the phase of the received ranging response signal pulses in relation to the transmitted ranging interrogation signal pulse to determine the range from the vehicle to individual reference points, and processes the range determinations to determine the position of the vehicle by multilateration. The mobile transceiver, transponders, and transmitter each include an RF transmitter having a modulator circuit for modulating an RF carrier signal to have a predetermined shape envelope determined by the shape of a modulating signal. [A3939]

"Radar signal processors"

Radar signal processor utilizing a technique for detecting targets moving slowly and clutter. The technique comprises dividing the clutter spectrum into a large number of narrow bands and in each band measuring the power ratio between upper and lower side bands. When this ratio exceeds a fixed threshold, the target is declared and, if necessary, its velocity signature can be detailed. [A3940]

"Turbulence detector for non-coherent pulse radar"

Information about air turbulence and wind shear can be obtained by analyzing the fluctuation of the envelope, at the detector output of a pulse radar, of backscatter from hydrometeors which trace the wind field. Further, under some conditions, radar returns can be identified as being backscatter from weather targets or from the ground or sea. The detector output signal is quantized into one of several class intervals whose boundaries, in mid-range, are in the same ratio. Consecutive radar returns from scatterers at the same nominal range and scan angle are quantized into either the same or different class intervals. The ratio of the number of consecutive quantizations that are different to the number of trials is a measure of the variance of relative velocities at that range and scan angle. This technique permits economical implementation of a plan position display of, for example, the expected severity of turbulence or wind shear at each increment of range and azimuth angle since duplication of circuits is not required. [A3941]

"Charge transfer device input circuitry"

A charge transfer device having a source diffusion region, an isolation gate region, a reference voltage gate region and an input signal gate region disposed contiguously along such device, the isolation gate region being adapted for coupling to a pulse voltage source, the duration of such pulse being related to a predetermined sampling interval (and therefore related to the bandwidth of an input signal being sampled) , the reference voltage gate region being adapted for coupling to a reference voltage source and the input signal gate region being adapted for coupling to the input signal. During each clock interval prior to the sampling interval the source diffusion region is pulsed, thereby enabling charge to pass from such region into the reference voltage gate region and the input gate region. During the sampling interval the potential energy level of the isolation gate region is lowered to enable equilibration of the potential of the charge in the input gate region with the potential in the reference voltage source region, the charge in such input gate region thereby being proportional to the input signal level during the sampling interval. At the end of the sampling interval the potential energy level of the isolation gate region is raised to isolate the source diffusion region from the input gate region and thereby inhibit charge flow from the input gate region to the source diffusion region if the input signal level varies prior to the time at which the charge in the input gate region is transferred to the first storage stage of the device. [A3942]

"Moving target indication radar"

A moving target indication radar (MTI) having a high azimuthal position detection accuracy. The received radar return signal is separated into quadrature components which are each converted to a series of digital samples. A continuous discrete fast Fourier transform is then performed on groups of samples corresponding to a predetermined number of contiguous azimuthal units of identical range producing an equal number of output Doppler frequency components which represent the relative speeds of stationary and moving objects within the contiguous azimuthal units. A new separate transform operation is performed for each new sample received. The transform outputs are processed to separately detect the stationary and moving objects. [A3943]

"Speed measuring device"

A special accessory for traffic radar devices includes two operating routines. These routines are to be used with a programmable microprocessor which comprises a portion of the traffic radar device. The routines are designated as a stopwatch routine and an interrupt routine. The stopwatch routine controls the overall operation of the speed computation within the programmable microprocessor of the traffic radar device while the interrupt request routine causes the microprocessor to perform as a precision clock capable of measuring elapsed time. [A3944]

"Signal processor"

A signal processor having a plurality of charge transfer devices fed by a series of input signals, input addressing circuitry for enabling sequential samples of such each one of input signals to be stored in corresponding ones of the charge transfer devices, such charge transfer devices storing corresponding sets of samples, output addressing circuitry for reading, sequentially, the sets of samples, the charge transfer devices, input addressing circuitry and output addressing circuitry being formed on a single crystal substrate. [A3945]

"Moving target indicator (MTI) radar systems"

Method and apparatus for the detection of a ground moving target using a moving platform MTI radar system are disclosed. Such a moving target is detected by comparing the power level of radar return signals passing in a difference channel of a monopulse receiver with a predetermined power level. In one embodiment, a monopulse antenna of such receiver scans a swath of ground and the power level of radar returns passing in the difference channel having a Doppler frequency equal to the Doppler frequency associated with clutter disposed along the boresight axis of such antenna is compared with a predetermined power level. When the power level of returns in such difference channel at such Doppler frequency is greater than the power level of returns from clutter disposed along the boresight axis (i.e., the predetermined power level) , a moving target is indicated. Such embodiment is particularly adapted to detect "slow" moving targets, that is, targets disposed in the main beam of the monopulse antenna and having a Doppler frequency within the Doppler frequency spectrum of returns from clutter disposed within such main beam. In a second embodiment of the invention the power level of returns passing through the difference channel having a Doppler frequency outside the Doppler frequency spectrum of returns from clutter disposed within the main beam is compared with the power level of returns passing through a sum channel of such monopulse receiver having such Doppler frequency. When the former power level is less than the latter power level, a moving target is indicated. This embodiment is particularly adapted to detect "fast" moving targets (that is, targets disposed in the main beam but having Doppler frequencies outside the Doppler frequency spectrum of returns from clutter disposed in the main beam) from large stationary objects disposed outside the main beam and illuminated by the side lobes of the monopulse antenna. [A3946]

"Radar system for detecting approaching vehicles from behind"

A radar system of the invention transmits a series of microwave burst energy backwardly of stationary vehicle to receive a return signal. When the return signal occurs within a preset time interval, a first and second Doppler signals are derived by mixing the return signal with first and second locally generated oscillations having a phase difference therebetween so that there is a varying phase difference between the first and second Doppler signals depending upon the direction of movement of the detected vehicle. A phase discrimination circuit generates a warning signal when the two Doppler signals have a predetermined phase relation. [A3947]

"Surface wave phase correlator and monopulse radar system employing the same"

A surface wave phase correlator comprises a pair of substantially identical launch and receiving filter electrode patterns disposed on a common piezoelectric substrate. The correlator is employed with receiving and processing circuitry in a monopulse radar system to provide relative phase information for target calculations by a digital processor. Fast rise and fall times for the correlator output signals enable rapid digital processing of incoming target signals. [A3948]

"MIPS Hover attachment"

An attachment is provided for aircraft, and particularly for helicopters, for use in conjunction with a microwave interference pattern sensor (MIPS) system, to sense low velocities, for example, such as are encountered when the helicopter is in a hover mode. The attachment includes an antenna array which is separated from the MIPS antenna array, and which comprises two sets of transmitting and two pairs of receiving antenna horn apertures mounted in orthogonal relationship with one another, the transmitting apertures of each set being scanned in sequence to produce a moving energy pattern which is intercepted by the receiving antenna apertures of the attachment, even though the aircraft is stationary. [A3949]

"Harmonic detector for traffic radar"

A traffic radar unit capable of operation from a moving patrol vehicle has a receiver provided with phase recognition circuitry that prevents the display of "ghost" readings. After initial processing of the incoming composite Doppler signal, the phase recognition circuitry receives logic conditioned, low and high frequency speed signals derived from the Doppler signal and produces an abort command to prevent the determined target speed from being displayed if the phase relationship between the two speed signals remains constant for a predetermined number of cycles of the low frequency speed signal. The latter signal corresponds to a low frequency component of the Doppler signal representing the speed of the patrol car, but the high frequency signal may be a harmonic that would produce an invalid reading. The circuitry employs a serial to parallel type shift register having a data input receiving the high frequency speed signal. The register is clocked by the low frequency speed signal. If all outputs of the shift register assume the same logic level, phase coherence (and hence a harmonic relationship) is recognized and the display is aborted to prevent ghost readings from stationary objects such as road signs, mixed outputs indicate a valid target (moving target vehicle) and the reading is displayed. [A3950]

"Coded pulse radar fuze"

1. A coded pulse radar proximity fuze with improved electronic countermeae protection, comprising: (a) transmitting means for radiating a recurring sequence of three pulses of two alternate frequencies at a target, each of said pulses being separated in time by the desired radar round trip delay time and each of said sequences of pulses being separated in time by a greater time than the desired radar round trip delay time, (b) means for receiving reflections of said recurring sequence of three pulses radiated at a target by said transmitting means, (c) means connected to said receiving means and to said transmitting means for combining the output of said receiving means with a portion of the output of said transmitting means, (d) means connected to said combining means for amplifying that portion of the output of said combining means having a frequency equal to the difference between said two alternate frequencies, and (e) means connected to said means for amplifying for detecting a sequence of two pulses separated in time by the desired radar round trip delay time. [A3951]

"Integral enable-disable means for guided wave radar intrusion detector system portals"

The intrusion detection capability of a guided wave radar intrusion detection system is selectively disabled in certain areas, such as gates or portals to permit ingress and egress of personnel and vehicles without affecting overall system performance and without requiring an independent detection system. This is realized by means of an integral system portal enable-disable device. Guided wave radar intrusion detection systems employ two parallel leaky transmission lines, one transmitting and the other receiving radar signals. Violation of the area between the leaky transmission lines by an intruder results in a signal that indicates the occurrence and its location. Gate areas are remotely enabled or disabled by a switching circuit that switches a segment of non-radiating transmission line into or out of the transmitting leaky transmission line in each selected gate region. [A3952]

"Portable buried object detection system with error reducing signal processing"

A portable apparatus used for geophysical exploration for buried objects h as mines, relics and minerals utilizing a means to represent the endpoints of the apparatus sweep and means responsive thereto to blank data received at these points, thereby eliminating erroneous signals likely to occur when the search head is in a tilted position. The end-point representation may be achieved by either a metronome-type signal generator or by an accelerometer. [A3953]

"Surface acoustic wave code reader"

A system is disclosed for reading a code established by a surface acoustic wave device. The system has a first antenna connected to a supply for transmitting a signal, a second antenna for receiving said signal and supplying it to a first transducer on a surface acoustic wave device, the first transducer converting the signal into surface acoustic waves, a second transducer on the surface acoustic wave device for converting the surface acoustic waves to a coded signal, a third antenna for transmitting the coded signal, and a fourth antenna for receiving the coded signal and connected to a receiver for providing an output dependent upon the coded signal. This system is particularly useful for access control systems. [A3954]

"Radar-operated vehicle safety assurance system"

A radar-operated vehicle safety assurance system includes a radar device which detects the vehicle relative speed or range to an object. A safety limit value of the detected operating parameter is computed by means of a safety range detection or safety speed detection circuit as a function of a detected operating parameter. A visual indicator is provided which visually indicates the difference between the detected value and the computed safety limit value to allow the vehicle driver to become continuously aware of the marginal conditions of the vehicle in relation to the safety limit. [A3955]

"Railroad radio frequency waveguide"

Disclosed is a waveguide for conducting radio frequency signals along a railroad line comprising the ballast, ties and rails of the railroad line. If the waveguide is utilized for intra-train communication, the wheels, axles and under-vehicle parts of the vehicles of the train comprise the side and upper surfaces of the waveguide. The waveguide may be utilized to: (1) transmit data such as train vehicle journal bearing temperatures, from remote locations to either the caboose or engine of the train, (2) guide radar-type radio frequency pulses ahead of the train, or (3) transmit any other data. In the radar embodiment, reflections received by a receiver on the train represent changes in the characteristic impedance of the waveguide. These reflections may be compared to anticipated reflections in order to detect improper conditions such as broken track or the presence of another train. [A3956]

"Radar systems"

The invention principally concerns marine radar systems and seeks to reduce "sea clutter". The radar transmitter is arranged to transmit a set of four pulses forming two pairs of pulses in which the pulses of a pair are time spaced by the radar interpulse period and frequency spaced by the reciprocal radar pulse length. The pairs of pulses are frequency and time spaced by several times the frequency and time spacing of the two pulses in a pair. Transmission takes place from a rotatable antenna which exhibits squint and the antenna is rotated at a rate which having regard to the squint effect and the time separation of the pulses is such that all of the four pulses irradiate the same areas in the plane of rotation of the antenna. This renders possible signal processing in the radar receiver to achieve both frequency and time decorrelation of clutter. [A3957]

"Device for measuring the range of a moving target and the speed at which it approaches or recedes"

A radio range measuring apparatus having a controlled modulation slope in order to keep the beat frequency between the transmitted signal and the received signal constant. The apparatus also measures the speed at which a mobile target approaches or recedes by means of a generator of a fixed frequency which, after frequency division, maintains the duration between the start of two consecutive sawtooth modulation signals fixed. A particular spectral line of the beat signal is demodulated by this fixed frequency via a mixer whose output is filtered by a passband filter. The signal at the output of the filter has a frequency which is equal to the Doppler frequency, proportional to the speed. [A3958]

"Radar device including a circuit arrangement for reducing interference"

A radar device such as the type which uses a non-constantly scanning radar antenna including a circuit arrangement for reducing interference due to ground reflection wherein an interference value is subtracted from the sampled received signal and wherein the interference value is obtained by recursively calculating from the sampled values with the use of a recursion factor which changes during the sampling sequence so as to reduce interference due to ground reflections and allow the detections of objects which are moving slowly in the radial direction. [A3959]

"Acquisition system for continuous-wave frequency modulation object detector"

A continuous-wave frequency-modulation active radiometric target seeking device performs search, acquisition, and tracking functions. A technique is provided for target range discrimination and recognition using a pair of narrow band i.f. filters also improving both signal-to-clutter ratio and signal-to-receiver noise ratio. Target search is accomplished with simultaneous and synchronized range and antenna azimuth scanning with range bins effectively swept across the target by variably modulating the transmitted carrier frequency. Recognition of a substantially point target is achieved by a bipolar pulse discriminator responsive to the i.f. filter pair. Upon target acquisition, tracking is maintained by imposing a high frequency dither upon the modulation frequency in a closed loop control using only a single i.f. filter. [A3960]

"Transponder reply limiting by means of recognition of fixed interrogation periods"

It is shown that the interrogation repetition period (IRP) of an interrogr can be recognized by a transponder and then used by it to both determine when the interrogator has elicited a predetermined number of replies called an adequate response and limit the interrogator to that number during each scan. This form of reply limiting by a transponder requires absolutely no change in the type of signals transmitted. Logic circuits that perform the required functions are provided. [A3961]

"Enhancing radar returns from targets having a small radar cross section"

A method for locatingweak targets such as power lines and tree tops in the presence of terrain clutter by separating the weak target from the clutter in the elevation plane. [A3962]

"Apparatus and methods for position determining and plotting"

Apparatus and methods are disclosed wherein the relative location of a point of position is mathematically determined based solely on knowledge of the included angles defined by an observation point and three non-colinear reference points, and of the distance between the three reference points. Apparatus and methods are also disclosed for position determining and position plotting which are not dependent on the existence of a predetermined or known relationship between the frames of reference defined for a chart, a plotter, and an external frame of reference for the positional data which is utilized to determine position. [A3963]

"System for protecting a vehicle-borne tracking radar against an off-target jammer"

A protective system for a vehicle-borne tracking radar, designed to counter the effect of an off-target jammer whose interfering signals are picked up by a directive antenna together with echoes from an actual target, comprises a receiver with a sum channel and a difference channel. In the absence of a jammer, the sum channel is connected via a signal processor to telemetric circuitry in the radar associated with the vehicular guidance system which keeps the antenna axis trained upon the target as the vehicle homes in on same. When a strong jamming signal is detected, a switching device in the processor cuts off the sum channel from the telemetric circuitry and supplies the latter, instead, with rectified error signals from the difference channel, these error signals being also delivered prior to rectification to a tracking-control circuit which energizes an antenna rotator to hold its axis in line with the jammer. The presence of a jammer may be detected by a signal-level comparator with two circuit branches connected to the sum channel, these branches including respective integrators which are alternately supplied with incoming signals in a target window and in a jammer window occurring at different instants of a recurrence period. Another possible jammer-signal detector, which may be included in the processor, receives the rectified error signal from the difference channel in the target window and produces a "jammer present" signal whenever the accumulated error signals exceed a predetermined threshold. [A3964]

"Motor actuating circuitry"

Motor driver/control apparatus employs a motor speed regulating amplifier configuration, e.g., two push-pull power amplifiers operable responsive to a motor speed-direction command input signal, and having the motor differentially connected between amplifier output ports. The amplifier (s) are supplied with an energizing potential of variable amplitude just sufficient for amplifier operation and to satisfy the then obtaining motor consumption. Accordingly, system power is effectively utilized, needless power drain avoided, and the amplifier cost and complexity is reduced since the amplifier need not dissipate inordinate source-supplied energy not required for motor actuation. In accordance with one further aspect of the present invention, a power supply switching regulator for a motor utilized in a radar application is operated at the radar pulse repetition rate. This produces a non-interferring zero frequency beat between the power supply and radar pulse rate in the radar receiver. [A3965]

"Passive navigation system with frequency coding"

On a vehicle to be navigated, a transmitter for radiating a signal having a plurality of frequencies and a receiver tuned to receive a predetermined harmonic of each of the plurality of frequencies, discriminate between the predetermined harmonics, and determine the range of position markers reradiating each of the predetermined harmonics, with a plurality of passive markers, each having a nonlinear electrical response characteristic and each tuned to reradiate the predetermined harmonic of a different one of the plurality of frequencies when the radiated signal from the transmitter impinges thereon, fixedly mounted at predetermined positions relative to a desired course to be traveled by the vehicle. [A3966]

"Short range precision navigation and tracking system and method therefor"

A short range, precision navigation and tracking system and method therefor are disclosed. The navigation and tracking system utilizes a master-repeater configuration with a phase lock loop controlling the modulation frequency of the master FM transmitter. [A3967]

"Ground station for the DME distance measuring system"

A novel DME transponder having a plurality of directional antennas arranged equidistantly on a circle each having a radial, highly directional pattern and as a group covering 360.degree. in the azimuth plane. The antennas are divided into at least two groups of nonadjacent antennas. Each group is connected to a receiver. The DME reply signal is radiated from the group containing the antenna which has received the DME interrogation signal with the greatest amplitude. The signal radiated in the direction of the interrogator is the DME reply signal, and the signals radiated in the other directions are used as filler pulses. [A3968]

"Radar target for remotely sensing hydrological phenomena"

Apparatus for remotely measuring and accessing water status relative to snow and glacial melt, surface runoff, rainfall, evaporation, flow rate, and soil moisture. A radar target located at a selected location on the surface of the earth is designed to collect water and render its cross-sectional area variable as a function of the height of the water level within the target. The target is remotely monitored by an orbiting or airborne synthetic aperature radar. The target appears as a bright spot embedded within the radar image. The target brightness is indicative of the height of the water level within the ground located target. [A3969]

"Range and angle determining Doppler radar"

A range, angle, and Doppler (velocity) measuring radar in which a CW, PRC radar floodlights a volume of interest. A receiving antenna in the form of a linear array generally broadside with respect to the bisector of the volume of interest is commutated (sampled) element-by-element to provide a phase modulated received signal from which angle information may be derived. Autocorrelation of the PRC signal received against the transmitted code provides for range determination and a Doppler filter bank is provided corresponding to each discrete receiving angle, the outputs indicating range and velocity of a target at each discrete angle of reception. [A3970]

"Multiple beam receiving array signal processor"

An array (aperture) signal processor using surface acoustic wave delay lines for reordering of the received signals according to the prime number transform algorithm. The output of the processor is a radar response equivalent to forming a multiplicity of narrow beams essentially simultaneously. Reordering of the received signals is simply a matter of rearranging the hardwired connections to a first SAW delay line, and convolution of the reordered signals is achieved by phase weighting the taps in a second SAW delay line which forms part of a transversal filter. [A3971]

"Auto theft detection system"

A system is disclosed for locating missing vehicles. Each vehicle broadcasts a locator signal when queried from a central station by an encoded call signal having a code characteristic of the vehicle. Indicators responsive to the locator signal are provided to determine the location of the missing vehicle. [A3972]

"Method and device for measuring the velocity of an object relative to a reference"

A method and apparatus for measuring the velocity of an object relative to a reference wherein the object has receivers thereon which scan a spatial function which originates from the reference. A signal is developed in each receiver, the value of which is dependent upon the position of the scanning range of the receiver relative to the reference. Signal values from a number of scanning ranges at various positions relative to the object are stored either simultaneously or cyclically at a first instant and then are compared with corresponding signal values obtained at a later time. The displacement of the spatial function relative to the object between the two scanning instants is determined and the velocity of the object is calculated from the magnitude of the displacement and the time elapsing between the scanning instants. [A3973]

"Materials separation"

A wash box for separating materials produced in, for example, a mining operation, into fractions of different densities. The machine is divided vertically into compartments, including at least one stratification compartment and at least one reject compartment, the raw material being delivered onto the grid, the level of water in the compartments being higher than the grid. Vertical pulsations are applied to the water in the compartments, causing the water to travel through the perforations of the grid, to stratify the material on the grid, while movement of the water through the wash box tends to carry the lighter fraction from the wash box. The pressure which pertains in the stratification compartment is continually monitored, such as by the use of a beam, emitted into a stand pipe connected to the stratification compartment, and which is reflected by the surface of the water in the stand pipe, the time taken for the beam to travel from the emitter to a receiver being used to produce an output signal, dependent upon the pressure pertaining in the stratification compartment. This continual monitoring is advantageously used to control the pulsations applied to the adjacent reject compartment, controlling the rate at which reject material falls over the edge of the grid, but may be used to advantage in the general control of operation of the wash box. Alternatively or in addition, separate conveyor means are provided, at differing vertical levels, for removing the reject materials of smaller size, which pass through the perforations of the grid, and the reject materials of larger size, which pass over the edge of the grid. Such an arrangement is particularly advantageous where the wash box is a compound wash box. [A3974]

"Apparatus for deriving information concerning the movements of a vehicle"

The invention provides an apparatus for deriving information concerning the movement of a road vehicle. In a preferred example a single microwave source is mounted under the vehicle to illuminate the road surface. Two receiving ports are provided, one to receive energy reflected from the illuminated surface to one side of the center line of the vehicle and the other to receive energy reflected from the illuminated surface to the other side of the center line. The two Doppler shifts are determined and compared to determine if there is a difference which indicates that the vehicle is turning, the sign of any difference indicating the direction of turn. One of the Doppler signals is shaped and counted to provide an indication of the speed of the vehicle and one of the Doppler signals is processed to provide an indication of forward or reverse motion. [A3975]

"Circuit for speed measurement of vehicles according to the Doppler-radar principle"

A circuit for speed measurement of vehicles according to the Doppler-radar principle wherein a Doppler-useful signal is evaluated in a computer to which such signal is infed by means of a threshold value switch. A single sideband modulator is provided, at the input side of which there is supplied the Doppler-useful signal and also a high-frequency signal produced by a high-frequency oscillator. The output side of the single-sideband modulator is connected with the input of a phase-locked loop, the output signal of which is converted into the original frequency band of the Doppler signal by means of a demodulator connected at its output side with the input of the threshold value switch. [A3976]

"HF coastal current mapping radar system"

A system for radar remote sensing of near surface ocean currents in coastal regions. The system employs a pair of low power, transportable high frequency radar units to scatter signals from the shore off to the ocean waves. Underlying surface currents impart a slight change in velocity to the ocean waves which is detected by the radar units. Each radar unit can determine the angular direction of arrival of the radar echo signals by comparing the phase of the signals received at three short antennas on the shore. Signals scattered from the same point on the ocean by each of the two geographically separated radar units are used to construct a complete current vector for that point. The radar pair takes simultaneous measurements over an ocean area with a predetermined grid pattern. Vectors are constructed for each square section of the grid, and a map of the near surface current field is output in real-time by an on-site minicomputer. [A3977]

"Amplitude selected phase interferometer angle measuring radar"

A phase interferometer elevation angle measurement radar has its antennas tilted slightly relative to each other so as to detect differences in amplitude from ground return signals, the phase difference in signals (normally utilized as an indication of depression angle below boresight in an interferometer radar) is checked for a positive rate of change, it is then compared against amplitude differences and is accepted as valid for use in generating an elevation angle only if within prescribed limits thereof. This resolves ambiguity in phase which results from a wide spread of antennas with respect to the wavelength of the radar. [A3978]

"Anti-collision radar system provided with circuitry for monitoring driver's"

A counter is provided for detecting the frequency of generation of collision imminence signals produced in a conventional type of anti-collision radar system for a vehicle. An odometer and/or a clock pulse generator is connected to the counter for applying a reference counting period so that the counter is utilized for generating a signal with which an alerting device which is independent from that of the radar system, is energized when the frequency reaches a predetermined value during the reference counting period. [A3979]

"Method and apparatus for identifying radar targets"

A method for identifying radar targets, especially ships at sea involves transmitting a first interrogation pulse, thereby causing a responder to generate a first identification signal containing a first set of data concerning the identity of the target, transmitting a second interrogation pulse causing the responder to generate a second identification signal containing a second set of data concerning the identity of the target and thereafter combining the two sets of data. The method reduces bandwidth requirements and garbling. An interrogator and responder for use in the method are also provided. [A3980]

"Reduction of echoes of irrelevant targets in a vehicle anti-collision radar system"

A signal proportional to steering angle is produced by a potentiometer controlled by the steering wheel, except for steering angles below about 0.1.degree. that are frequently used for corrections in driving on a straight course. for steering angles above about 0.5.degree., the signal remains constant in magnitude. The signal controls a range gate of the radar system suppressing the effect of echoes beyond a maximum range limit smaller than the intercept of a radar ray at the beam edge on an arc concentric with the curved path of the vehicle having a radius of curvature exceeding that of the vehicle path by a predetermined amount which is chosen so as to preclude reception of echoes from guard rails situated on the outside of highway curves. The steering angle signal can be provided together with other functions contributing to a maximum range limit operation for the radar for a more comprehensive elimination of echoes irrelevant to the anti-collision purpose of the radar, thereby reducing unnecessary warnings. [A3981]

"Synthetic aperture using image scanner"

In a system for generating a synthetic aperture, a lens or antenna for focusing the radiation from an object scene onto an image sensor which is shifted by a clock at the rate of motion of objects in the object scene and thereby to produce the real tire imaging of the object scene with high resolution. A system for reconnaissance, surveillance and ground mapping. A system for high speed data imaging, medical patient scanning, label scanning, and image correlation. [A3982]

"Focused synthetic array"

This invention relates to a focused synthetic array wherein a different signal from a crossed beam antenna is converted to a bipolar video signal and applied as the input to a synthetic array processor. In another embodiment of the invention there is a separate reduction of each beam output from a crossed beam antenna to bipolar video signals with a separate application of asymmetrical amplitude weights to the two bipolar video records and a subsequent subtraction in the course of synthetic array processing. [A3983]

"Means for developing a radar tracking error signal"

A tracking radar error signal that is independent of pulse to pulse variations of amplitude of the received signal is derived by combining separately detected sum signal energy and difference signal energy in a manner that provides composite error signal pulses that are one-half sum signal energy and one-half sum plus difference signal energy. The pulse composition is realized by means of an RF switch that interrupts the difference signal during approximately one-half of each pulse period. The composite error signal is detected by an IF logarithmic detector and subsequently processed by two parallel box car generators. One box car generator is gated to process sum signal energy and the other is gated to process sum plus difference signal energy. The tracking error signal is obtained from a single pulse by feeding the outputs of the two box car generators to a differential amplifier and obtaining the difference voltage at its output. [A3984]

"Radio determination using satellites transmitting timing signals with correction by active range measurement"

The time-of-arrival of timing signals transmitted by two satellites is measured relative to a crystal clock, and an approximate position fix is computed for the ship or other object being located. Because of clock error the position fixes are displaced along a hyperbolic line of position. A two-way active range measurement through a third satellite or one timing signal satellite enables computation of an independently determined line of position, the true position fix being at its intersection with the hyperbolic line of position. The clock error is corrected and the method of position fixing from two timing satellites is repeated until the clock drift exceeds acceptable limits. A continuous navigation service and also position surveillance are realized. [A3985]

"Method and apparatus for measuring the interior dimensions of a hollow body"

An apparatus for measuring the interior dimensions of the walls of a hollow body. The apparatus is insertable into a restricted opening of the hollow body and includes means for transmitting a beam of electromagnetic energy toward an interior wall of the hollow body. When the electromagnetic energy illuminates the interior wall, acoustic waves are radiated back to the apparatus. The apparatus detects the acoustic waves and measures the elapsed time between transmission of the electromagnetic energy and detection of the acoustic waves. From elapsed time measurements the dimensions of the interior walls are obtained. [A3986]

"Hybrid dual mode radiometric system"

An improved high frequency radiometric system features time shared passive and active modes of operation for correlation of active and passive signal returns. The processed, normalized, and stored passive signals are subtracted from similarly treated active signals to suppress the effect of returns from back ground terrain, thus enhancing true target recognition. A second channel provides discrimination against jamming and spurious signals, thus reducing false alarms. [A3987]

"Method and apparatus for the control of the safety distance of a vehicle relative to preceding vehicles"

A method and apparatus for the control of the safety distance of a vehicle with respect to preceding objects wherein various measurements and controls are effected so as to provide control magnitudes for enabling prevention of a collision of the vehicle with an object. The various measurements and controls which may be effected include the determination whether a detected object lies within a maximum inference-free measuring distance from the vehicle, the changing of the pivot angle of an antenna of the vehicle and possibly also the opening angle of the transmitted beam independence on the steering wheel deflection and/or traverse acceleration of the vehicle, suppressing large extended objects by a separate measurement of the distance of the vehicle to the object and relative velocity of the vehicle with respect to the object by comparison of the measure change and distance with a calculated change in distance or the measured relative velocity with a calculated relative velocity, preferring an object recognized as a preceding vehicle among all objects, and combining in accordance with the maximum inference-free measuring distance values of at least one of the measured distance of the vehicle to the object, the measured relative velocity of the vehicle with respect to the object and the measured velocity of the vehicle to provide the control magnitudes. [A3988]

"Hybrid terminal assist landing"

Control of multiple remotely piloted vehicles provided through a system ced the Hybrid Terminal Assist Landing. This system, also referred to as HYTAL, is composed of two principal subsystems, an RF approach control subsystem and a precise optical landing point homing and ranging subsystem. By using a hybrid combination of RF and optical sensors, the remotely piloted vehicle, RPV or other aircraft approach control and recovery guidance system can be optimized with respect to performance complexity, size, weight and cost. [A3989]

"Range gate generator with velocity aiding"

Apparatus and method for controlling the operation of a range gate generator used in a pulse radar is shown. In accordance with the disclosure, the position of the range gate, or gates, out of the range gate generator is controlled from pulse to pulse primarily in accordance with the Doppler velocity of a selected target and the pulse repetition interval of the pulse radar with a periodic correction in accordance with the range of such target. [A3990]

"Anti-collision vehicle radar system"

The anti-collision vehicle radar system overcomes interference problems due to radar beams from similar radar systems on other vehicles by providing a radar transmitter having a transmitting antenna which transmits a radar beam having circular polarization with a particular direction of rotation of the polarization, a radar receiver for receiving the radar beam after reflection thereof and including a receiving antenna having means for discriminating in favor of received signals having circular polarization with said particular direction of rotation while discriminating against received signals having circular polarization with the opposite direction of rotation of the polarization, the receiving antenna thereby being effective to discriminate in favor of a reflected radar beam from the associated transmitting antenna while discriminating against any interfering radar beam from another vehicle radar system, and utilization means connected to the receiver for utilizing received radar signals to control the operation of the vehicle. for example, the brakes of the vehicle may be applied if the received radar signals indicate that the vehicle must be stopped to avoid a collision. The transmitting and receiving antennas may include helical antenna elements which are coiled in opposite directions to achieve such discrimination. [A3991]

"Transponder for a moving vehicle tracking system"

In a Doppler (frequency shift) spacecraft tracking system, a transponder mounted on the spacecraft including, two or more, receivers connected to spaced-apart antennas for receiving an RF tracking signal transmitted from a ground based station regardless of the attitude, or position, of the spacecraft. The intermediate frequency (IF) signals from the receivers are combined to provide a continuous third IF signal at the proper frequency and at a phase dependent upon the signals received, which third signal is utilized to control a transmitter for retransmitting coherent reply carrier frequency signals to the ground based station. [A3992]

"Dual frequency transmission apparatus for frequency-agile radar systems utilizing MTI techniques"

This invention discloses pulse radar apparatus for the transmission of radar pulses having a pair of frequencies in each rf pulse. One of the frequencies transmitted in each pulse is repeated in the succeeding pulse while the other frequency is changed to a new frequency. Moreover, the repeated frequency appears in the same relative position in the pulse pair as in its original occurrence. [A3993]

"Navigational aid"

A navigational aid enables the effect of a course and/or speed alteration of one vessel on the nearest possible approach distance of another vessel to be calculated, using data readily obtainable from a simple relative radar display on said one vessel. The aid comprises a plurality of sealed manually-settable means for individually setting in data inputs respectively representative of the following: (1) the minimum nearest approach distance if no course or speed change is made, (2) the range of said other vessel, (3) the present speed of said one vessel, (4) the proposed course alteration, (5) the proposed speed alteration, and (6) the time for which the proposed course and speed will be held. The aid further comprises means to compute from the foregoing input data the resultant nearest possible approach with the proposed manoeuvre, and indicating means to provide an indication of said resultant nearest possible approach. [A3994]

"MTI radar system and method"

An MTI radar system having a four pulse canceller where the interpulse periods vary preferably according to a double or triple sawtooth pattern is disclosed. The four pulse canceller is comprised of a two pulse canceller cascaded with a three pulse canceller. The three pulse canceller is arranged to accomplish summations of three weighted pulses in two operations, one involving fixed binomial weights (1, -2, 1) and the other variable components (a', b', c') . The interpulse period choices and sequence of use permit the variable weights to be defined by polarity and binary fractions implemented by the use of controllable scalers and polarity reversers. [A3995]

"Process and apparatus for the detection of objects, especially of objects having a very small equivalent surface area"

A process and apparatus for the detection of an object in air, wherein a beam of electromagnetic radiation is emitted, the reflected beam is received, the frequency of the reflected beam being varied discontinuously over a frequency band. The amplitude of the energy of the beam received for the various frequencies of the emitted beam is measured so as to utilize, for the detection of the object, the particular frequency or frequencies of the beam for which the reflected beam possesses a substantially higher energy than the energy of the beam reflected at the other frequencies. [A3996]

"Obstacle detecting radar apparatus for a motor vehicle or the like"

A vehicle mounted obstacle detecting radar is disclosed. An electromagnetic wave radiated from the radar apparatus is received by a first antenna mounted on the ground and passed through a transmission line to a second antenna mounted on the ground and radiated thereby to a monitor area. A response electromagnetic wave from an obstacle within the monitor area is received by the second antenna and passed through the transmission line to the first antenna and received by the radar apparatus. When the transmission channel is arranged along a curved road, an obstacle in the curved road can be detected. [A3997]

"Interferometric protective system for vehicles"

A base band transmitter cooperates with dual base band receiver antennas, a single receiver channel, and a tapped delay correlator device for the prevention of vehicular collisions, the configuration effectively narrowing the normally wide base band antenna pattern to span a single predetermined forward traffic lane. [A3998]

"System for estimating acceleration of maneuvering targets"

A radar system of the type utilizing an optimal estimator to process raw range and angle track data for driving a radar antenna, where the tracking computations, range rate, and angular rate of the range vector are utilized in estimating the target velocity vector and the target acceleration vector. The attenuation inherent in the practical estimation of target acceleration is effectively removed for severely maneuvering targets by a compensating system that provides an attenuation factor, and multiplies the estimated acceleration output signal by the reciprocal of such factor. The implement control system is governed by the estimated target position and estimated target velocity from the estimator, and the modified acceleration signal of the compensating system. [A3999]

"Radar system for an anti-collision system for a vehicle"

A pair of antennas mounted on a vehicle receive an echo wave reflected from an obstacle to produce a pair of Doppler signals, the variation of the phase difference of which is used to indicate the direction of the relative movement of the obstacle. The phase difference also represents the difference in propagation lines and is proportional to the relative angular displacement of the obstacle so the rate of variation of relative angular displacement is detectable because the increase and decrease of phase difference negate each other. [A4000]

"Surface roughness measuring apparatus"

A doppler radar of the type normally used to measure relative speed between a transmitter and a reflector is mounted so that its antenna is directed toward the surface to be measured. The radar is coupled to a means for de-emphasizing the doppler shift frequencies of the return signal associated with the speed of the vehicle and emphasizing the lower frequency components of the back scattered signal. The energy contained in these components provides an indication of the roughness of the surface which is in relative motion to the radar. [A4001]

"Vehicle collision preventing apparatus"

A vehicle collision preventing apparatus determines the danger by an output of a radar for detecting the distance to an obstacle and the relative velocity in a danger determining circuit wherein the distance to the obstacle and the relative velocity at the present are estimated from the data given before disappearing the data of the radar by an estimate arithmetic circuit when a signal reflecting from the obstacle reduces to be incapable of detecting the obstacle by the radar. [A4002]

"Range rate measurement"

A continuous wave frequency modulated signal is radiated from a range rate measuring system and returned by a target, the range rate of which, relative to the measuring system, is to be determined. The radiated signal and return signal are mixed to produce a beat frequency signal which is converted to a square wave signal marking passage of the beat frequency signal above and below its average value. A detector produces signals indicative of the presence and absence of transitions of the square wave signal at the turnaround points of the modulation waveform. The range rate of the target is directly related to the rate of the presence and absence of such signals. [A4003]

"Vehicle guidance system"

Terminal guidance of vehicles is accomplished by accurately determining true position and speed of the vehicle from terrain contour measurements and updating a dead reckoning navigation system with precision to permit navigation by following a programmed flight path. A narrow beam radar altitude sensor measures vehicle clearance altitudes and a reference altitude sensor measures the vehicle clearance above a reference level. These measurements are input to a digital processor for comparison to stored digital terrain contour reference data. Recursive data matching is performed in the digital processor by a nonlinear Kalman filtering technique to provide vehicle position and vehicle velocity correction signals to a navigation controller that generates steering commands to the vehicle control system. Three vehicle position and three vehicle velocity signals are generated and updated in the nonlinear Kalman filtering technique to give near real-time three dimensional position and velocity information. [A4004]

"Vehicle collision anticipating method and device"

An improvement of a vehicle collision anticipating method and device using transmitted and reflected frequency-modulated continuous waves is provided. A low frequency wave is produced by mixing a part of transmitted wave and a reflected wave from the object. The low frequency wave and a Doppler signal obtained from the low frequency wave are signal processed so as to generate signals. A predetermined distance range is obtained by multiplying a time which is determined by the distance between the vehicle and object and the velocity of said object with respect to the vehicle obtained from the Doppler signal, by a relative velocity of the object with respect to the vehicle. A collision of the object against the vehicle is anticipated by detecting the object entering the predetermined distance range in front of the vehicle. [A4005]

"Dual frequency alarm device using Doppler effect for sensing a moving object"

An electrical or supersonic wave having a predetermined frequency is emitted as a monitor wave from an emitting device into a zone to be monitored. When a moving object having an inherent velocity range intrudes into the zone, a reflected wave of the monitor wave from the moving object is received by a receiver and an alarm signal is issued when the frequency deviation of the reflected wave relative to the frequency of the emitted monitor wave is within the frequency range corresponding to the velocity range. The alarm device has a circuit for producing a first alarm responsive to the alarm signal, a circuit for changing the frequency of the monitor wave when the first alarm is issued, and a circuit for producing a second alarm when a further alarm signal is obtained from the monitor wave with changed frequency within a predetermined time after change of the monitor wave frequency. The circuit for changing the frequency of the monitor wave comprises a variable capacitance diode and a voltage regulating circuit which progressively changes the reverse bias voltage for the variable capacitance diode. The circuit for producing the second alarm comprises a signal processing circuit that produces a trigger signal for producing the most important alarm when an alarm signal has been produced for the overall frequency relative to the monitor wave with progressively changing frequency. The alarm is designed for inclusion of different degrees of seriousness of warning by gradual reduction of the monitor zone with changes in the frequency of the monitor wave. [A4006]

"Automatic ground-clutter rejection in weather pulse radar system"

Ground clutter is automatically eliminated from echo signals in a weather pulse radar system to provide signals having an amplitude corresponding to the average intensity of the weather echo over a number of pulses. The reflected waves received in the receiver are linear-detected to provide echo signals. Each one of successive echo signals is compared with another later one which is apart from the each one echo signal by a predetermined time period during which fluctuation of weather target becomes independent, to derive an AC component signal corresponding to the fluctuation. The variance of the amplitude of the derived signal is proportional to the mean power of the weather echo. Thus, the ground clutter and the DC component of the weather echo are eliminated. The AC component signals are unipolarized and, thereafter, averaged. The averaged signals have an amplitude corresponding to the average intensity of the weather echo. These averaged signals may be logarithmic-converted to provide logarithmic signals similar as in weather radar system employing radar receivers having a logarithmic characteristic. [A4007]

"Angle/vector processed, phase-accumulated single vector rotation, variable order adaptive MTI processor"

In-phase (I) and quadrature (Q) radar return signals are converted to phase to provide phase difference between like range bins of successive pulse repetition intervals (PRI's) , the phase differences being reconverted to I and Q format for accumulation across multi-range-bin windows surrounding each range bin to be processed, the normalized range bin accumulations being continuously accumulated in the angle domain, in successive PRI's, to provide clutter phase angle estimates used to rotate incoming target video vectors, a single time, back to the estimated zero-doppler phase of the first PRI of a multi-PRI batch for clutter-elimination filtering. Third-order and fourth-order filtering (utilizing four-PRI and five-PRI batches, respectively) , is achieved on a constant one-out-of-four PRI output basis by utilizing the same weighted data for the highest PRI of one fourth-order batch and the lowest PRI of the next higher fourth-order batch, which is rendered possible by the continuous accumulation of estimated phases, over successive PRI's. [A4008]

"VIP doppler filter bank signal processor for pulse doppler radar"

A low PRF pulse doppler radar system utilizing a VIP digital filter bank signal processor to suppress echoes from terrain, rain, and chaff, and pass echoes from aircraft moving at higher speeds is disclosed. Each of a plurality of VIP filters individually provides high attenuation to undesired signals over designated frequency bands, the width of which are a large fraction of 1/T.sub.av where T.sub.av is the average interpulse period. Little or no attenuation of desired signals having doppler frequencies greater than 1/T.sub.av occurs. The outputs of the plurality of filters are desensitized to prevent false alarm from clutter, and the presence of a desired radar pulse echo is determined by a comparison with a threshold level. [A4009]

"Method and apparatus for orally announcing vehicle speed"

Apparatus for orally announcing the speed of a moving vehicle. A radar speed detector produces a multi-digit binary-coded-decimal representation of vehicle speed. These signals are converted to a modulated audio frequency signal that a demodulator, audio amplifier and speaker convert into oral digits for the driver to hear. [A4010]

"Transponder decoder/encoder circuitry"

A single crystal controlled oscillator provides clock pulses that are used to drive both the decoder shift register and the encoder shift register of an ATC transponder. An input pulse of the interrogation signal from a ground station is shifted down in the decoder shift register and is time correlated with a subsequent pulse of the input signal to verify the validity of the interrogation. A valid interrogation signal triggers gate logic circuitry which loads data into the encoder shift register. The clock pulses from the oscillator are processed to the appropriate frequency for driving the encoder shift register, which outputs serial data for transmission as a coded reply signal responsive to the interrogation signal. The decoder shift register and cooperating edge trigger coincidence gate circuitry suppress side lobe interrogation signal and inhibit operation of the transponder when same are present. [A4011]

"Miniature doppler radar systems and microwave receivers suitable therefor"

A doppler radar system comprises a solid state microwave source which is pulsed on and off with a duty cycle typically around 10.sup.-3. The microwaves are transmitted towards a nearby target with a small amount supplied to a mixer also supplied with signals received from the target. The mixer output is passed through a gate opened in coincidence with the mixer pulsed output, and supplied to an integrator whose output forms a doppler signal representing target velocity. Target directionality is found by providing two channels fed in quadrature phase. [A4012]

"Range mark generation"

In a digital weather radar display, of the type which displays information on a cathode ray tube in the form of parallel intensity modulated sweep lines and which displays range marks in the form of a plurality of arcs of concentric circles, the positions of the range marks along each of the sweep lines are determined by utilizing a read only memory which stores, for each sweep line, an indication of the distance between range marks and the distance from the beginning of scan of the line to the first range mark. [A4013]

"Ground station for a round-trip-path distance-measuring system"

This DME ground station permits the distance from the touchdown point (where no transponder can be installed) to be measured on the aircraft without any change in the airborne equipment. The time difference between the reception of an interrogating signal and the transmission of a reply signal is chosen so that the transmission of reply signals from the DME transponder located on one side of the runway corresponds to a transmission from the touchdown point with respect to the signal transit time. On the ground, a DME transponder is located on one side of the runway on a level with the touchdown point, and a receiver and a direction finder are provided on the other side. [A4014]

"Mobile radar method for sensing inclusions in subsoil"

A method and apparatus is described comprising a transmitter for transmitting an unmodulated carrier of selected wave length into the ground and a receiver adapted to receive reflected signals. Circuitry is described for producing narrow pulses from the transmitted and received signals for displaying them on an oscilloscope and on a plotter. The display on the oscilloscope is rotated through 90.degree. from the conventional display so that the pulses corresponding to the transmitted and reflected signals appear as horizontal bars spaced apart vertically by distances which correspond to the depth of the inclusions below the surface. The wave length is selected to be at least four times the anticipated depth of the inclusions. The apparatus is described as being incorporated into a motor vehicle such as a Land Rover with the transmitting antenna mounted at the front and the receiving antenna at the rear of the vehicle. The apparatus is most conveniently situated in place of the co-driver's seat for operation by an operator sitting in the rear of the vehicle. Decoupling between the transmitting and receiving antennae is partially achieved due to the rotation through 90.degree. of the polarity of the reflected wave relative to the transmitted wave. [A4015]

"Electronic detection and identification system"

An electronic detection and identification system for use in the rapid identification of vehicles at a toll stop, and like uses, is provided which employs an electronic identification card that is carried by the vehicle to be identified and a fixed transmitter-receiver unit that transmits a signal to the card and receives a reflected signal therefrom. The card contains passive resonant circuitry for producing an output signal having a frequency which is a selected harmonic of the signal transmitted thereto. In operation, the card is radiated with a signal which has a freqency in the Gigahertz range and which is produced by frequency sweeping and multiplying a frequency stable RF signal. The signal reflected by the card is narrow band-filtered and RF amplitude (envelope) detected. The detection envelope, which is the "signature" of the received signals, is compared with a reference profile to determine whether a match exists. An appropriate action, such as the generation of a "go" signal, is initiated based on the results of the comparison. [A4016]

"Pulse radar apparatus"

Pulse radar apparatus particularly for marine use has a dispersive antenna so that transmitted pulses sequentially of two or more different frequencies are radiated in different azimuthal directions. The antenna is continuously rotated and the receiver has separate channels for the different frequencies and display means correlating information received on different frequencies from the same azimuth thereby to reduce sea-clutter on the display. [A4017]

"Passive transponder apparatus for use in an interrogator-responder system"

A passive transponder for use in an interrogator-responder communication system is disclosed, including a first signal receiving element having a variable reflection property, a code signal generator for supplying a code signal, a modulating device responsive to the code signal for varying the signal reflection property of the first signal receiving element, and a power supply for supplying direct-current operating power to the code signal generator and to the modulating device, the power supply including a second signal receiving element for receiving a second electromagnetic signal having a second frequency different from the first frequency, and an a-c to d-c converter for converting the second signal to direct-current power. [A4018]

"Detection of angular displacement to an object from the moving vehicle"

A pair of first and second antennas is mounted at the front end of a roadway vehicle. A first sequence of recurring bursts of energy at two different frequencies is transmitted from the first antenna and a second sequence of similar bursts of energy is transmitted from the second antenna at alternate intervals with the bursts of energy transmitted from the first antenna. The signals transmitted from the first and second antennas are reflected from an object and received respectively by the first and second antennas and sampled at appropriate intervals to derive a first set of two Doppler signals from the signal received by the first antenna and a second set of two Doppler signals from the second antenna. The relative phase between the Doppler signals derived from the first antenna and the relative phase between those derived from the second antenna are detected by first and second phase detectors, respectively. The outputs from the phase detectors are subtracted from each other to utilize the difference therebetween as an input data to a microcomputer to determine the angular displacement of the object from the center axis of the vehicle. [A4019]

"Device for controlling the conical scanning frequency for conical scanning radar systems"

A device for controlling the conical scanning frequency of conical scanning radar systems. An antenna illuminator is caused to revolve by means of a three-phase asynchronous rotary field motor. The angular frequency of conical scanning is changed in a random or pseudo-random manner by means of a reference generator associated with the asynchronous motor, a random or pseudo-random signal generator, and a circuit comparing the signal of the reference generator and the signal of the signal generator. The comparison circuit provides "greater," "less" and "equal" outputs. A switching device driven by those outputs couples a braking magnetic-field or the three-phase supply to the motor, depending upon whether a "greater" or "less" output, respectively is the present comparison circuit. The "equal" output also controls the change of state for the random or pseudo-random signal generator. [A4020]

"Digitally processed radar speed sensor"

A Doppler speed sensor for a ground vehicle wherein errors due to vehicle tilt relative to the ground surface and initial mounting angle error are substantially eliminated by using a first antenna with its radiation pattern directed down and forward and a second antenna with its radiation pattern directed down and rearward, so the principal axes of the radiation patterns are 90.degree. apart. A novel digital technique for processing the signals received from such antennas is also disclosed. [A4021]

"Trans-horizon navigation system"

A trans-horizon navigation system wherein a predetermined sequence of control pulses is phase-encoded onto an RF carrier for transmission from a first transceiver to a second transceiver, the second transceiver including a correlator which provides an output pulse in response to detecting the sequence of control pulses in a received transmission. An improved AGC circuit configuration is also disclosed. [A4022]

"Transponder-responder system"

A transponder-responder system is provided which comprises a home station and at least one remote station. A transmitter at the home station periodically generates interrogation pulses by means of a directional sweep antenna across a search area. Each remote station includes a receiver and transmitter. Upon receipt of an interrogation pulse by the remote station receiver and while enabled, the remote station transmitter transmits a digitally encoded response signal which is received by a receiver at the home station. Upon receipt of the response signal by the home station receiver, timing circuitry at the home station determines the distance between the home and remote station by measuring the elapsed time between the transmission of the last interrogation pulse and the receipt of the response signal. Additionally, the home station includes circuitry which determines the rotational position of the sweep antenna and circuitry which decodes the response signal. [A4023]

"Polar to rectangular coordinate converter"

A memory for a coordinate converter stores, for each azimuth at which information from an information source may be received in a polar coordinate system, the incremental X and Y coordinate values, .DELTA.X and .DELTA.Y, for an incremental change in range along the azimuth. for each azimuth these incremental coordinate values .DELTA.X and .DELTA.Y are retrieved from memory and entered into summing devices which are incremented respectively by .DELTA.X and .DELTA.Y for each increment of range. The integers of the values of the summing devices represent X and Y coordinate values in a rectangular coordinate system and may be utilized to address an information reception device such as a random access memory. [A4024]

"Range resolving doppler radar system"

A system for measuring unambiguous target range for targets at high velocities in which target range and doppler frequency data from three sequential transmission dwells of radar returns are stored, each dwell having a different pulse repetition frequency (PRF) . The dwell storage unit which includes three sets of dynamic registers is loaded and unloaded serially with respect to range and supplied to a 17 path doppler frequency correlator. After the three dwell storage registers have been loaded with a basic PRF plus jitter, the range interval unfolding is performed by a recirculation process in each of the registers. During recirculation the data is applied to a correlation unit, the purpose of which is to insure that the velocity of the target satisfies a 17 path algorithm across three adjacent dwells in at least one of five range azimuth profiles or paths. Because the same target velocity may cause outputs in adjacent doppler filters due to PRF jitter, the correlation utilizes a criteria that for all three possible PRF sequences the filter numbers across the three range bins and paths must be within one of each other. As the filter correlation function is capable of multiple path selection the filter path outputs are priority selected to produce a valid target. The final output from the system is a verification that the data in the three range bins of interest satisfies the seventeen path correlation algorithm formed of three dwells and three adjacent range bins with a possible PRF jitter of one filter in each range bin. [A4025]

"Ground plane corner reflectors for navigation and remote indication"

A device to be used as a guidance system for sonar or radar or similar transmissions in which a dihedral reflector is used in association with part of the earth's surface (land or sea) whereby a trihedral reflector results for such transmissions in which spurious signals are avoided because the earth forms one of the reflective surfaces to thereby remove spurious signals which could otherwise occur with a normal trihedral reflector. [A4026]

"System for preventing collision of vehicles"

A system for preventing collision wherein a radar system is mounted on a vehicle for generating a relative speed signal and a relative distance signal. There are provided a brake signal generating logical circuit responsive to the relative speed signal and the relative distance signal for actuating a brake actuator, first and second comparators for comparing the relative speed signal and the relative distance signal respectively with reference signals, and an information processing signal responsive to the outputs from the first and second comparators for actuating the brake actuator. There is also provided a braking signal releasing circuit for disenabling the brake actuator after the vehicle has stopped. [A4027]

"Vehicle identification system, using microwaves"

A vehicle identification system, using microwave, in which every vehicle to be identified has an identification panel attached to its side, containing a very low level power drain tunnel diode transponder and a digital coder plus a small battery and a resonant frequency array. Interrogating transmitter-receivers are placed at designated ground stations. for verification purposes there is a resonant reflective array printed on the identification panel to reflect back a doppler offset signal emitted by the interrogating transmitter, thereby registering that a vehicle with an identification panel has passed, even if the transponder has failed. Unlike optical scanners used for freight car identifications, this system cannot be disrupted by dirt, ice and snow. Vehicles do not have to slow down to be interrogated, and the emitted field strength from this plate is so low that F.C.C. licensing is not required. The code stored in the panel is readily programmable, if desired. [A4028]

"Marine radar interrogator-transponder target detection, identification, and range measurement system"

A marine radar interrogator-transponder navigation and collision avoidance system provides facilities for early detection of, identification of, and communication with cooperating marine vessels. for these purposes, a general coded call may be transmitted by own ship to all other ships in radio range, the reply then being returned from each answering ship with the coded identification of that ship. In this manner, the other ships may be identified. Own ship may call a specific second ship or a shore based transponder, the called transponder returning only the coded message it received. Own ship may call a specific second ship causing an alarm to call the ship's operator to a radio telephone, the identical coded message being reradiated. The invention provides means for application in cooperative systems using a finite number of such discrete interrogator-transponder addresses for receiving proper replies from responding transponders lying on a radial line with respect to own ship so that the replies are not destroyed by overlap. Other problems are solved related to the use of a finite number of addresses which may be less than the expected population of addressed ships, rendering it possible that two or more transponders will reply with the same address codes. [A4029]

"Constant false alarm rate moving target indication radar system (CFAR-MTI)"

A constant false alarm rate (CFAR) moving target indication (MTI) radar system, operable in various electronic countermeasures (ECM) environments is disclosed. A modified Dicke-Fix circuit is used to drive the MTI. Operation of the invention results in automatic restoration of signal level out of a filter. Thus the invention provides a CFAR-MTI that is not degraded significantly by swept jammers and is not captured by off-frequency jammers. [A4030]

"Surface roughness measuring system"

Apparatus for obtaining significant height information of ocean waves, or peaks of rough terrain utilizing means for compressing the radar signal over different widths of the available chirp or Doppler bandwidths, and means for cross-correlating one of these images with each of the others, where the center frequencies of the images have a spacing .DELTA.f.sub.rO. Upon plotting a fixed (e.g., zero) component of the cross-correlation values R.sup.E (.DELTA.f.sub.rO) as the spacing is increased over some empirically determined range, such as 0 to 1 MHz, the system is calibrated. Thereafter to measure height with the system, a spacing value is selected and a cross-correlation value is determined between two intensity images at a selected frequency spacing, such as 0.1 MHz. The measured height is the slope of the cross-correlation value determined to the spacing value used. Both electronic and optical radar signal data compressors and cross-correlations are disclosed for implementation of the system. [A4031]

"Radar reconnaissance system for track vehicle recognition"

A radar reconnaissance system for recognition of echo signals from track type vehicles such as tanks. Circuits are included for identifying a Doppler spectrum shift on either side of the spectral line 2FD (harmonic of the main moving target Doppler frequency) due to echo signals from a track of the vehicle, the tracks inherently having point-by-point velocities up to double the vehicle velocity. [A4032]

"Anticollision car radar"

The radar has two antennas which radiate RF signals of different frequencies and whose radiation patterns overlap. The frequencies of the radiated signals are generated by amplitude-modulating a single RF signal with two low frequency signals. The signals received by one of the two antennas are evaluated by determining, in an evaluating device, the difference between the amplitudes of the RF signals of different frequency which are reflected from an object. A DC voltage signal proportional to the above difference is generated and the DC voltage signal is fed to a threshold circuit whose threshold is determined by a predetermined azimuth range. Therefore, it can be determined if the reflecting object is in the same road lane as a car equipped with the radar. [A4033]

"Microacoustic shear bulk wave device"

A microacoustic signal processing device for propagation of shear bulk waves in a substrate. A preferred embodiment of the device includes a substrate having opposed, polished principal and second surfaces. An input interdigital transducer supported on the principal surface includes a plurality of aluminum electrodes photoetched on the principal surface, a ZnO layer overlying the electrodes, and a conductive aluminum film overlying the ZnO layer. Shear bulk waves propagated by the input transducer are available for processing at various locations on the principal and second surfaces of the substrate. [A4034]

"Beacon system employing ramped gain receiver"

A beacon receiver or IFF system in which the gain of the receiver is time varied to enhance the discrimination between response from transponders located ahead of the interrogator as compared with the responses from transponders in the side or rear lobe regions of the interrogator antenna pattern. The system is employed with a directional antenna and signal processing apparatus giving sum .SIGMA. and difference .DELTA. channels. In accordance with this invention, the gain of the receiver in the sum .SIGMA. channel is increased from the minimum value to a maximum value beginning after the end of interrogation pulse. The difference .DELTA. channel is varied in gain from the time in the beginning after the end of the interrogator pulse but the gain is varied inversely from the maximum level at the beginning of reception to a maximum level at the end of reception. [A4035]

"Radar-operated vehicle safety apparatus"

The apparatus of the invention comprises a radar device for measuring the range of an object and the vehicle speed relative to the object, and a vehicle speed sensor for measuring the vehicle roadway speed. A first computing circuit is provided to set up a first minimum distance allowed for the vehicle when approaching a stationary object and a second computing circuit for setting up a second minimum distance allowed for the vehicle approaching an object moving ahead of the vehicle. An alarm will be given either when the range of the stationary object reaches the first minimum distance or that of the moving object reaches the second minimum distance. [A4036]

"Intra-pulse MTI system with range ambiguity suppression"

A dual-pulse coherent MTI system having a time interval between pulses as short as zero. The pulses are "chirped" in opposite sense, the latter constituting a unique coding for eliminating range ambiguity problems. Video return signals are received and applied to two parallel channels each containing pulse compression and limiting circuits. The pulse compression circuits are matched uniquely to the positive chirp slope pulse in one channel and to the negative chirp slope pulse in the other channel. The channel corresponding to the earlier of the two pulses is subjected to a fixed delay of one pulse width before the outputs of the channels are differenced to produce a net MTI signal. This is a continuation of application Ser. No. 159,751, filed July 6, 1971, now abandoned. [A4037]

"Identification system using coded passive transponders"

An identification system including a transmitter, a receiver, a decoding subsystem, and a passive transponder identifier. One passive transponder identifier of the invention is a surface acoustic wave device provided with pad means for applying and removing pressure on a substrate of the device at preselected locations. A second identifier of the invention is a microacoustic shear bulk wave device. The passive transponder identifiers are programmed to produce a characteristic coded electronic reply in response to an electromagnetic signal interrogation. [A4038]

"Control system for mobile radio communication"

A control system for mobile radio communication, in which the whole service area is composed of a plurality of small radio service zones in each of which communication is sufficiently possible with the transmitting power of any of mobile stations belonging to the service zone, a base station of each of the small radio service zones and a control station for controlling the whole service area are interconnected through a binary code transmission line, and in order to prevent simultaneous transmission of the control signal from a plurality of mobile stations when the mobile stations in the whole service area achieve transmission and reception of the control signal between each of them and the control station over a common control channel, the control station transmits to the mobile stations information representative of the busy or idle status of the common control channel from the mobile stations by the interruption and transmission of an idle line indication signal. By reversing the signal state of the binary code transmission line to its normal state, information of the detection of transmission from the mobile stations by the base stations is transmitted to the control station, and in the control station, the idle channel indication signal is interrupted by the earliest one of the reversed signals arriving from the plurality of base stations. The start of the control signal is indicated by restoring the signal state of the binary code transmission line to its normal state. The control station resumes transmission of the idle channel indication signal upon completion of the reception of the control signal. [A4039]

"Apparatus for preventing collision of vehicles"

An apparatus for preventing collision of a vehicle comprises A device for measuring a distance R from a driving vehicle to an obstacle and a relative velocity V of the driving vehicle to said obstacle, A circuit for generating a damping signal when the relation of the distance R, the relative velocity V and a preset deceleration .alpha. becomes the relation of R < V.sup.2 /2.alpha., a deceleration detector for detecting the actual deceleration .alpha.' of the driving vehicle, A correction circuit which compares the actual deceleration .alpha.' detected by the deceleration detector with the preset deceleration .alpha. and the damping signal is corrected depending upon the comparative data. [A4040]

"Compensation for simultaneous platform motion and antenna scanning in MTI radars"

The effects of simultaneous platform motion and antenna scanning are compated for in radar systems of the moving-target-indicator type. Signals from auxiliary sub-arrays of the antenna compensate signals from main sub-arrays of the antenna for the effects of antenna scanning. Delayed, scanning-compensated signals from the main sub-arrays are then combined with undelayed, uncompensated signals from the main sub-arrays to provide signals that are compensated for the effects of scanning motion and platform motion. A first embodiment provides a clutter canceller having motion compensation at each stage of cancellation. A second embodiment provides a large number (N) of motion-compensated signals which are synchronized in time and phase for further MTI processing. [A4041]

"Motion-compensation arrangements for MTI radars"

The effects of platform motion or antenna scanning in radar systems of the oving-target-indicator type are compensated for by arrangements which use difference-channel signals to correct sum-channel signals for the changes in phase and amplitude of the backscattered sum-channel signals due to the platform motion and antenna scanning, respectively. Clutter-canceller arrangements having motion compensation at each stage of cancellation and an arrangement for providing a large number (N) of motion-compensated signals which are synchronized in time and phase are shown. [A4042]

"Clutter tracker using a smoothed doppler frequency measurement"

A clutter tracker in which received clutter velocity signal is shifted to zero doppler in order that optimum moving target indicator (MTI) cancellaton can be achieved is disclosed. A frequency controllable voltage controlled crystal oscillator (VCXO) is used as the coherent oscillator (COHO) source. The subject digital system changes the VCXO output bus only once per dwell, thus allowing adequate filtering to achieve desired performance without adversely affecting tracking performance. [A4043]

"Digital weather radar including target severity analysis capability"

A digital weather radar system having a mode that clears the display of all clutter and lighter precipitation to reveal or positively present only the contoured areas, i.e., the severe "cores" or "hard spots." Data representative of the searched space is stored at least temporarily in a digital memory. In the preferred embodiment, a controllable decoder operates on this data according to the particular decoder state selected, the decoder output is D/A converted, and the resultant analog signal is used to intensity modulate a cathode ray tube (CRT) . [A4044]

"Monopulse, fan-beam, search-radar system with improved height and azimuth determination"

Multipath signals are eliminated at all but the lowest elevation angles awing monopulse techniques to be used to determine target height and azimuth in a two-dimensional, fan-beam, search-radar system. A narrow-azimuth fan beam is oriented at an angle to the vertical plane and has its boresight centered approximately on the horizon so that a V-beam is formed by the direct beam and the portion of the direct beam reflected from the surface (i.e., the portion that is below the horizon) . The reflected beam does not interfere with the direct beam except in a multipath region near the reflecting surface. Frequency diversity or a receive-only beam in the vertical plane may be used to determine if a target is in the multipath region. [A4045]

"Communication apparatus for communicating between a first and a second object"

An improved communication method and apparatus for communicating between a first object and a second object wherein the first object includes apparatus for generating and transmitting a modulation signal having at least a predetermined number "L" pulses within a predetermined time interval and less than a predetermined number "M" pulses within the same predetermined time interval, and wherein the second object includes apparatus for receiving and detecting the modulation signal and providing an output signal in response to detecting at least the predetermined number "L" a pulses and less than the predetermined number "M" pulses. This CROSS-REFERENCE TO RELATED APPLICATIONS this application is a division of the Applicant's co-pending application entitled "COMMUNICATION APPARATUS for COMMUNICATING BETWEEN A FIRST and A SECOND OBJECT," Ser. No. 462,247, filed Apr. 19, 1974 and now U.S. Pat. No. 3,986,167, which was a continuation-in-part of a then co-pending application entitled "COMMUNICATION APPARATUS for COMMUNICATING BETWEEN A FIRST and A SECOND OBJECT," Ser. No. 221,712, filed Jan. 28, 1972 and now U.S. Pat. No. 3,839,717. [A4046]

"Digital sidelobe canceller"

A digital open-loop canceller is used to decorrelate one signal from anot in such applications as coherent sidelobe cancellers and moving target indicators. The invention measures the correlation between a complex main input signal and a complex auxiliary input signal in digital form. It divides the correlation coefficient by the average value of the auxiliary signal magnitude squared, multiplies the ratio by the auxiliary signal and subtracts the result from the main input signal to cancel correlated components. [A4047]

"Method for measuring physiological parameter"

A method for measuring such physiological parameters as pulse rate and respiration without physically connecting electrodes or other sensors to the body. A beam of phased energy, for example microwaves, is directed toward the body of a person at a region thereon which undergoes physical displacement corresponding to variations in the parameter being measured. The phase relationship of the energy reflected from the body is compared with that of the transmitted energy to determine the extent of physical movement of the body region as affected by the parameter being measured. The present method may be used as an overt or covert lie detection technique. [A4048]

"Vehicle guidance system"

A vehicle guidance system is disclosed that is suitable for guiding a vehicle or person along a straight line navigational aspect with signaling and processing typical of hyperbolic navigational systems, for example, in certain farming operations where the farm vehicle utilized must repeatedly be caused to traverse an unmarked field in substantially straight parallel paths that are evenly spaced with respect to one another, such as in fertilizing the field. An electronic navigation system is utilized which includes a transmitter and a receiver positioned upon the navigating vehicle and a pair of repeating transmitter/receivers spaced with respect to one another a known or measured distance and along a line normal to the intended straight line path to be followed by the vehicle. The transmitter causes each repeater to be alternately energized and the resulting signal is detected at the vehicle mounted receiver and the phase difference between each transmitted and received signal is measured. The measured signals are then used to determine an error signal if the vehicle has departed from a predetermined straight line path. A typical use in a farming operation is to position two repeaters at one edge of a field and then cause the farm vehicle to repeatedly traverse the field in straight lines that are equally spaced with respect to one another a distance so as to give substantially equal coverage, such as, for example, to substantially evenly fertilize a field. [A4049]

"Doppler shift actuator and intrusion systems"

In a first mode, a security system uses the Doppler effect to permit the automatic activation of a bolt by the patterned movement of a reflecting card in the vicinity of a Doppler unit. In a second mode, the system behaves as a conventional intrusion detection system to activate an alarm for an unauthorized intruder present within an area to be monitored. The first mode operates to verify a combination given a user implemented by the movement of a reflecting member towards and away from the Doppler unit based on a predetermined code. If the movement of the reflector is proper and within a predetermined time period, a valid comparison will be had to automatically cause a bolt to unlatch and open the door. The unit is placed in the second mode when all access to the door is prohibited and the system operates as a conventional intrusion detector. [A4050]

"FM-CW radar for range and relative speed determination"

An FM-CW vehicular distance and relative speed measuring device which compares instantaneous reflection signal frequency to the instantaneous FM-CW transmitted frequency to derive distance (range) and speed information. Searching means including a mixer, frequency programmer, and logic circuits evaluates a plurality of fractional range increments for signal presence and Doppler spectrum evaluation to determine relative velocity with sense. The FM-CW waveform is a sawtooth and means are included for blanking the sawtooth flyback. [A4051]

"Target detection system in a medium PRF pulse doppler search/track radar receiver"

In a medium PRF pulse doppler type radar receiver, target detection is achieved in both search and track modes. In the search mode, the video signal from the receiver section is notch filtered to cancel the main beam clutter. The remainder of the signal is threshold detected, followed by ranging each of the thresholded signals to resolve the range ambiguity of the signals. The unambiguous signals are gated through a range sensitive threshold which operates along a power curve of R.sup.4, resulting in true target returns being thresholded by the range sensitive threshold circuit and blocking out discrete sidelobe returns. In the track mode, the video signal from the receiver is clutter cancelled to remove main beam clutter, as in the search mode, and the remaining signals pass through a velocity track filter with a narrow band window. The true target return signal ranged during the search mode, is passed by the velocity track filter which is adjusted to match the true target return doppler shift during the correct range gate. The velocity track filter is controlled to track the true target return signal and is narrow enough to reject discrete sidelobe signals which occur in the same range cell. The signals passed by the velocity track filter are subsequently monitored, and guard gates are established in both adjoining range cells to insure that lock on the tracked target will not be lost due to interfering signals such as returns from moving ground targets. When the interfering signals are detected in the guard gates, the system goes on memory until the interfering signal passes. [A4052]

"Obstacle detecting system"

An obstacle detecting system comprising an oscillating device for generating and directing to an obstacle a first oscillating signal in a first time period and a second oscillating signal having a different frequency than that of the first oscillating signal in a second time period, an antenna for receiving the signals reflected from the obstacle, a detector for mixing the signals received by the antenna and the output of the oscillating device to generate a detected signal which comprises a first signal component derived by mixing the first oscillating signal reflected by the obstacle and received by the antenna with the second oscillating signal generated by the oscillating device and a second signal component derived by mixing the second oscillating signal reflected by the obstacle and received by the antenna with the second oscillating signal generated by the oscillating device, and an information signal circuit for receiving the detected signal and generating information relating to the distance between the antenna and the obstacle and information relating to the relative velocity of the antenna and the obstacle. [A4053]

"Braking system for avoiding a collision of a vehicle with an obstacle thereof"

A radar sensor and a vehicle velocity sensor are mounted on a vehicle, producing three signals representative of, vehicle velocity, a distance and a relative velocity between the vehicle and an obstacle ahead thereof. These three signals are fed to a collision imminence computing circuit which generates two signals representative of collision imminences depending upon whether the obstacle is stationary or moving. [A4054]

"Method and apparatus for measuring the distance between two stations"

A method and system for determining the distance between two stations interconnected through a carrier wave connection for data transmission by frequency modulation (FM) or phase modulation (PM) and, if necessary, transferring the data concerning the distance determined. At least one of the two stations is movable and each station comprises a transmitter, a receiver and a transceiver antenna for said FM or PM data transmission. During operation the antennas are interlocked. The carrier wave transmitted by the first station and being normally FM or PM modulated by data signals is interrupted a number of times in this station. Upon detection of each one of these interruptions, the second station introduces a similar, corresponding interruption into the carrier wave transmitted by this second station. The carrier wave is normally also FM or PM modulated by data signals. The period of time between the transmission and reception of the associated interruptions is measured in the first station as a measure of the distance between the stations. [A4055]

"Radar-operated collision avoidance system for roadway vehicles using stored information for determination of valid objects"

A radar-operated collision avoidance system for a roadway vehicle comprises a radar device for sensing the vehicle speed relative to an object and its distance thereto to decide whether the vehicle is approaching the object at a dangerously high speed. A minimum allowable distance represented by a digital code is stored in a memory location within an array of rows and columns and read out in response to a sensed vehicle speed relative to the roadway and to a sensed magnitude of steering movement. The minimum allowable distance is compared with the distance sensed by the radar to determine that the decision is valid only when the latter is smaller than the former. [A4056]

"Imminent collision detection apparatus"

Apparatus is herein disclosed for imminent collision detection equipment for acknowledging proximity between a first object carrying the equipment and a second object. The imminent collision detection apparatus is a radio distance measuring device and includes a transmitter and a receiver. The transmitter has a pulsed energy output which is reflected back by a target and mixed with a reference source of pulsed energy generated a predetermined time after the transmitted output and coherent thereto. The coherent feature of the equipment lies in the fact that the transmitter pulsed output and the pulsed reference signals are both generated with the same starting phase each generated pulse. Furthermore, the transmitted and reference signals are jittered to provide a resistance to countermeasures capability. [A4057]

"Apparatus for the detection of buried objects"

Apparatus for the detection of buried objects comprising a broadband, high resolution short pulse transmitter and a bistatic or monostatic noncontacting antenna for radiating the transmitted signal through the ground for reflection from a buried object, a sampling type receiver which reduces the bandwidth and center frequency of the received signal, and a locking circuit controlled by the first reflection from the ground or soil surface to thereby lock the range sweep to the soil surface and eliminate the effects of antenna height variations. [A4058]

"Underwater monitoring"

Apparatus for detecting the presence of an underwater object measures variations in the input impedance of a monopole antenna to provide data on the object. A sweep generator supplies a first electrical signal of varying frequency for transmission as an electromagnetic signal propagated through water from the antenna, and means are provided for detecting reflections of the electromagnetic signal to provide a second electrical signal, which is compared with the first electrical signal to provide an output signal. Preferably, the monopole antenna is one of three such antennas, which are provided with means for comparing input impedances of the antennas to provide an output signal representing the bearing of the object. [A4059]

"Target range sensor"

The specification discloses a radar sensor for detecting short-range, slowly moving objects and using the range versus time data to develop a prediction of the time at which the range of the object will be at a minimum to the sensor. The sensor uses a pulse transmission of a radio frequency signal with object reflections being received and detected. Subsequent signal processing eliminates returns from clutter and stationary objects so that signals from low velocity objects can be detected. Computations are performed in a digital processor to compute an estimate of the time and of the range when the object will be closest to the sensor. [A4060]

"Foreground subject-identifying apparatus"

A foreground subject-identifying apparatus comprises a sweep signal generator for issuing a sweep signal having frequencies f.sub.s falling within a prescribed range, a carrier wave generator for producing a carrier wave having a frequency f.sub.0 , a first frequency mixer for mixing output signals from the sweep signal generator and carrier wave generator to generate an output signal having a frequency f.sub.0 .+-.f.sub.s , a first antenna through which to transmit an output signal from the first frequency mixer, a second antenna mounted on the foreground subject to receive an output signal sent forth from the first antenna, a coding circuit carried on the foreground subject which is provided with a plurality of resonance circuits resonating at different frequencies f.sub.T and adapted to form a specified code from a combination of these different resonance frequencies, a signal mixer for detecting an output signal from the second antenna to supply a signal having frequencies f.sub.s to the coding circuit and modulating the signal having a frequency f.sub.0 by resonance signals from the coding circuit to deliver a signal having a frequency f.sub.0 .+-.f.sub.T to the second antenna, a second frequency mixer for mixing an output signal having a frequency f.sub.0 from the carrier wave generator, and a signal having a frequency f.sub.0 .+-. f.sub.T received from the signal mixer through the second and first antennas and thereby issuing a signal having a frequency f.sub.T , and a coded signal interpreting circuit for detecting resonance frequencies out of a signal delivered from the second frequency mixer, thereby interpreting a coded signal supplied from the coding circuit. [A4061]

"Passive encoding microwave transponder"

A passive transponder which provides remote identification of objects including cargo and trailers, vehicles or a variety of objects which move through an interrogator beam. The passive transponder is mounted onto the vehicle or object or at the location to be identified. A transmitted beam from the interrogator is directed to the transponder. Some of the beam's energy is rectified and used to power digital electronic circuitry within the transponder which generates a signal with a serially-coded digital waveform. This signal amplitude modulates a harmonic generator in the transponder which produces and emits harmonic energy derived from the incident beam from the interrogator. This harmonic energy is readily identified by an interrogator receiver which is tuned to that harmonic of the incident signal. The transponder information from the interrogator receiver is decoded in the interrogator data processor to provide the desired identification number. An internal clock frequency is generated within the passive transponder as a result of transmitted energy from the interrogator beam, and this clock determines the read-out rate of the encoded data from a field programmable read-only memory. [A4062]

"CCD focal plane processor for moving target imaging"

A CCD focal plane processor having a plurality of columns of individual sensor elements with plural sensor elements per column. The structure includes plural CCD shift registers corresponding to the number of columns of sensors, each CCD shift register including a pair of stages corresponding to each of the element sensors of the corresponding column of the array. Two "snapshots" of the scene are taken at time-displaced intervals and are compared to detect differences therebetween to eliminate background, or unchanging scene content. The individual sensors provide outputs which are injected into the .alpha. stages of the corresponding paired shift register stages of each CCD shift register in a first time interval corresponding to the first "snapshot". The resulting charge packets in the first (.alpha.) stages then are advanced to the second (.beta.) stages of each shift register pair. The second "snapshot" corresponds to injecting a second signal into the .alpha. stages of the plurality of pairs of .alpha., .beta. stages. The CCD shift registers then are read out simultaneously and in succession as to the plural, related .alpha., .beta. pairs of stages containing the time-displaced elemental signal samples. A further CCD shift register including a number of .alpha., .beta. pairs of stages receives the parallel .alpha., .beta. outputs in corresponding time sequential manner to maintain the .alpha., .beta. related pair arrangement of the time-displaced elemental samples. An output circuit compares the .alpha., .beta. signals for each elemental area and determines the difference therebetween. A CRT display receives the difference signal outputs for displaying moving target information. [A4063]

"Clutter subtraction system"

A radar system having transmitted and received signals, the system including a feedback loop for modulating a sample of the transmitted signal to duplicate the phase and amplitude of the clutter echoes from nearby points of reflection. The modulated transmitted sample is subtracted from the received signal to remove the clutter. The feedback loop detects differences between the clutter-free signal and the transmitted sample to produce an error signal, the error signal being filtered and applied to the modulator for modulating the phase and amplitude of the transmitted sample. BACKGROUND of THE INVENTION This invention relates to echo ranging systems such as radar and sonar systems and, more particularly, to an echo ranging system in which clutter returns from nearby objects are removed from echoes from distant objects. Echo ranging systems frequently utilize transmitted pulses of radiant energy in which the duration of the pulse is equal to a substantial portion of the overall round trip time of propagation of radiant energy signals from the echo ranging system to a distant object and back to the echo ranging system. The use of a long duration pulse of radio frequency energy permits the transmission of a large amount of radiant energy as compared to that which can be transmitted in a relatively short pulse from transmitting equipment which is limited in its maximum peak power capability. To produce enhanced discrimination in range between closely spaced reflecting objects, the spectrum of the transmitted pulse of radiant energy is broadened by a modulation of the carrier, such modulation being typically a phase modulation of the carrier, one such form of phase modulation employing a quadratic phase shift pattern which results in a frequency modulation pattern in the form of a linear sweep. Such a modulation pattern is conveniently employed with pulse compression filters in radar and sonar receiving equipment for the discernment of closely spaced points of reflection. A problem arises in that echo ranging systems are frequently employed in situations wherein nearby objects of reflection and distant objects of reflection, often referred to as targets, are simultaneously present. While the leading edges of echoes from nearby targets arrive at the radar or sonar system prior to the leading edges of echoes from distant targets, the relatively long duration of the transmitted pulses may result in extensive overlap of the major portion of the echoes of nearby targets with the echoes from distant targets. When the aforementioned linear sweep frequency modulation is employed, the instantaneous frequency of a portion of an echo from a nearby target differs from the instantaneous frequency of an overlaping portion of an echo from a distant target. Furthermore, the amplitude of an echo from a nearby target, such as the echo from a wave in a sea clutter situation, is much larger than the amplitude of the echo received from a distant target. In view of these differences in frequency, or phase, and amplitude of the echoes, the clutter of echoes from the nearby targets masks the echoes from the distant targets. Difficulties are encountered in echo receiving equipment in that automatic gain control used therein must have a large dynamic range to accommodate the large and the small amplitude echo signals. Such automatic gain control equipment, when tracking the large amplitudes of the clutter, tends to distort the waveforms of the echoes received from the distant targets with a resulting loss in data obtainable from such distant targets. The foregoing situation relates to both electromagnetic and sonic echo ranging systems and, since the invention to be described hereinafter applies to both electromagnetic and sonic echo ranging systems, the ensuing description will be given in terms of a radar system, it being understood that the description relates equally well to a sonar system. SUMMARY of THE INVENTION The aforementioned problems of the prior art are overcome and other advantages are provided by a radar system having transmitted and received signals, and which, in accordance with the invention, modulates a sample of the transmitted signal to substantially duplicate received clutter signals, the modulated sample being subtracted from the received signal to provide a received signal free of clutter. In a preferred embodiment of the invention, the transmitted signal is phase modulated quadratically with time, this being a linear frequency sweep over the duration of the transmitted signal pulse. Such modulation provides a transmitted signal having an increased bandwidth suitable for the pulse compression of received signal echoes. In accordance with the invention, the aforementioned subtraction of the transmitted signal sample is accomplished by a feedback loop in which the clutter-free signal is compared to the transmitted sample by a detection of inphase and quadrature components of the clutter-free signal to develop an error signal of the feedback loop. The error signal is then filtered and applied to a modulator which modulates the phase and amplitude of the transmitted sample to match the phase and amplitude of the clutter. Thereby, the clutter component of the received signal may be subtracted from the received signal. The bandwidth of the feedback loop provides a sufficient speed of response for tracking clutter of nearby reflecting objects for which the frequency and phase of the echo approximates that of the transmitted signal phase. The loop bandwidth is sufficiently narrow to preclude the tracking of echoes from distant reflecting objects for which the frequency of the echoes differs substantially from that of the transmitted signal pulse. Thereby, distant objects, or targets can be observed since the echoes therefrom are essentially unaffected by the feedback loop. [A4064]

"Electronic docking system"

An electronic docking system utilizing a multiplicity of sensing subsystems to derive and display docking parameters during the docking operation is disclosed. The parameters displayed include bow and stern velocities ship's velocity perpendicular and parallel to the jetty and ship's orientation to the jetty during the docking maneuver. Parameters are derived from data gathered by sensors that include a receive only monopulse and a receive only doppler system which determine the angular position of a selected reference location aboard the ship and a signal with a frequency representative of the ship's velocity from a signal radiated from a beacon antenna aboard the ship. Range measurements are accomplished by utilizing baseband pulse radar systems capable of determining range to accuracies in the order of one foot. A telemetry link between the ship and the shore based system provides a means for simultaneously displaying data on board and on land and for relaying docking commands from the jetty master to the docking pilot. [A4065]

"Range or doppler gate deception rejection system"

A doppler radar wherein the range signal is differentiated to obtain a range rate of change and a velocity signal is obtained from the doppler frequency shift of signals returned from a target, and wherein the range rate and velocity signals are compared and, if the difference exceeds a predetermined amount, the range and doppler or velocity circuits are reset. [A4066]

"MTI System processor and method"

A method and apparatus for removing the effects of radar platform movement and for otherwise processing doppler radar signals in a moving target indicator doppler radar in which targets in the main beam having reflective characteristics sufficient to override side lobe attenuation are tracked relative to the side lobes and the residual doppler frequency for such targets resulting from side lobe detection calculated. Based on this calculation, the appropriate ones of a bank of doppler filters are inhibited at the appropriate range bin to prevent a false target indication without inhibiting the display of moving targets in the main beam at the same range but having different doppler frequencies. A novel automatic gain control circuit which provides dynamic amplitude adjustment of the radar return signal to match the dynamic range of the radar processor on a range bin-by range bin basis is also provided as is a novel signal processing circuit for removing the effects of radar platform movement from the radar return signal. The use of a sensitivity time control is disclosed as is the method of vector rotation and quadrant resolution. [A4067]

"Underground pipe detector"

An apparatus and method wherein an electrical impulse source transmits a radar-type signal through an antenna into the ground and is reflected by a target. The reflected signal or echo is detected by the antenna and an analog-to-digital converter converts it to a digital form which may be readily operated on, stored and recalled. A memory stores the information until recalled for comparison with a subsequent signal to give an indication of the location of metallic and non-metallic buried targets. [A4068]

"Passive transponders using acoustic surface wave devices"

A passive transponder sensitive to electromagnetic pulses received in the form of surface acoustic waves. The device utilizes a plurality of interdigital transponders each consisting of a metallic deposit on a piezoelectric substrate and serving as an electrode. Transponder deactivation and energy interruption means provide programability and coding. [A4069]

"Fuze modulation system"

1. An improved noise-modulated distance-measuring fuze comprising in combtion: an oscillator, a transmitting antenna coupled to said oscillator for radiating a signal towards a target, a modulator coupled to said oscillator to cause frequency modulation thereof, said modulator comprising a random noise generator, a band-pass shaper connected to the output of said noise generator for frequency shaping the random noise output thereof, a limiter coupled to said band-pass shaper for amplitude shaping the frequency-shaped noise output thereof, an integrator coupled to said limiter for integrating the frequency-shaped and amplitude-shaped output thereof, and means connecting the output of said integrator to said oscillator in such a manner as to frequency modulate said oscillator, a receiving antenna adapted to receive a portion of the signal radiated from said transmitting antenna after reflection from a target, mixer means for mixing the received signal from said receiving antenna with a local signal taken from said oscillator to produce a difference-frequency mixer output signal, said mixer output signal having a frequency spectrum peaked at a frequency greater than zero that decreases with decrease of fuze-to-target distance, the frequency at which the mixer output signal is peaked and the broadness of the spectrum in the vicinity thereof for a given fuze-to-target distance being dependent upon the characteristics of said band-pass shaper and said limiter, and means coupled to said mixer and responsive to the frequency at which said mixer output signal is peaked for functioning the fuze at a predetermined fuze-to-target distance. [A4070]

"Electromagnetic intrusion sensor"

An electromagnetic intrusion sensor for detecting the presence of moving ects within a specified detection range by sensing the interaction between the moving objects and an electromagnetic field generated by the sensor. [A4071]

"Non-linear spread spectrum transmitter/receiver for a homing system"

A spread spectrum transmitter/receiver in a pulse ranging system including surface acoustic wave devices with a nonlinear transducer to reduce frequency shift errors due to doppler effects. [A4072]

"Doppler radar system"

A Doppler radar system for controlling portable traffic signals in response to on-coming traffic. Each of two channel amplifiers of the system is fixed at high gain and passes both noise signals and Doppler signals to a phase detector. A threshold element provides a control signal when the average level of the phase detector output between high and low levels changes sufficiently, due to the presence of Doppler signals, from a mean level which is due to noise alone. [A4073]

"Stepped dual-frequency, ocean-wave spectrometer"

A coherent stepped dual-frequency, ocean-wave, spectrometer radar system for measuring the characteristics of ocean-surface gravity waves includes: a transmitter for transmitting in successive steps coherently related pairs of frequencies having different, small, and known frequency separations, a coherent receiver for receiving and separating the radar returns of the stepped pairs of frequencies, a frequency-shifter for offsetting the doppler spectrum of each radar return, a multiplier for multiplying together the two frequencies of each pair for each step to obtain a Bragg resonance condition for each step, and a plurality of stepped detectors each for detecting a different step of said multiplier output. [A4074]

"Moving target indication radar"

A moving target indication radar is disclosed in which the zero-Doppler-speed components of the radar return signal are eliminated by correlation processing in the azimuthal direction. In some cases, a similar correlation processing is concurrently performed in the range direction. The moving target indication radar has both a radar signal analog processing portion and a radar signal digital processing portion. The received pulse returns are processed by quadrature phase detectors to provide outputs which are in phase and quadrature phase analog data signals representing real and imaginary parts of the Doppler frequency data. These signals are converted to corresponding digital words which are then divided into a plurality of digital Doppler frequency components by a discrete Fourier transform circuit. A buffer memory is connected to store the outputs of the discrete Fourier transform circuit. An amplitude calculator selectively receives the outputs of the buffer memory and computes the root-mean-square value for each output of the discrete Fourier transform circuit stored in the buffer memory. A second buffer memory is connected to store the outputs of the amplitude calculator, and a correlation processing circuit averages the outputs of the second buffer memory which represent the data of a plurality of every n-th one of the unit azimuthal regions and subtracts the average output from the data for the center of the plurality of unit regions. [A4075]

"High prf unambiguous range radar"

A pulse-compression MTI doppler radar system includes an antenna, a transter, a coded modulator, a receiver and a display. The coded modulator is connected to the transmitter and has at least two waveform generators for coding pulses having low cross-correlation. A pulse-compression filter having at least two pulse compressors for providing pulse compressed signals is connected to the receiver. Each pulse compressor is matched autocorrelatively to a different one of the waveform generators. An MTI processor has two MTI processing channels which are responsive to the pulse-compressed signals and provide an output to the display. [A4076]

"Fixed dual beam range scanning and tracking radar with digital display"

A light weight, low power radar principally adapted for use on small vehicles such as sailboats, which has a fixed antenna providing a continuous forward looking beam which provides range information and limited azimuth information in manual and automatic range scanning modes of operation, and which is capable of automatically tracking targets in range. In the manual mode of operation, a voltage representing a manually selected range is compared with a sweep voltage synchronized with the radar transmitter pulse to generate a pulse having a time relationship to the transmitter pulse corresponding to the selected range. This pulse is utilized to gate a video echo from the radar receiver to logical control circuit which operates in conjunction with the antenna lobing control to actuate a display indicating whether the target is to port or starboard of the vehicle heading. The range voltage is also converted to digital form for display on a digital display device. In the automatic scanning mode, the range scale of the radar is scanned at a slow speed by a sweep voltage representing this range scale. At any ranges at which targets appear, the scan is interrupted for a short period of time during which time the range voltage for this particular portion of the scan is gated through for conversion to digital form and displayed on the digital range display. In the tracking mode, a target to be range tracked is selected from either the manual or scan mode and automatically locked onto by means of a range tracking circuit. During the tracking mode, the range voltage is continually converted to digital form and displayed on the digital range display. The range rate (speed) of the target and the estimated time of arrival (ETA) to the target are computed. Either one can be selected for display on a second digital display. [A4077]

"Logic circuit for an automatic braking system for a motor vehicle"

Braking of a vehicle is prolonged by an improved logic circuit for a time or a distance to overcome stop starting braking due to momentary "safe" signals caused by multiple reflection of a radar signal. [A4078]

"Traffic radar and apparatus therefor"

Apparatus is provided for determining the frequency of unknown periodic input signals and primarily generally sinusoidal signals which may be accompanied by very substantial noise. More particularly, the system for determining the frequency of unknown periodic input signals accompanied by substantial noise is adapted to a unique traffic radar or doppler radar system. The apparatus includes a phase locked loop in which the incoming signal accompanied by noise is compared with the output from a voltage controlled oscillator to generate a synthetic signal which is substantially free of noise and is well adapted for counting, measuring and display circuitry to give a direct indication of the input signal frequency or a parameter directly related to that input signal frequency. Specifically in doppler radar systems the direct readout is in "miles per hour", a direct function of doppler frequency. The signal which is being subjected to frequency determination is applied directly to the comparator portion of the phase locked loop circuit and it is also applied to the comparator portion of the phase locked loop circuit through a tunable band pass filter whereby speed of response is obtained without loss of noise rejection or frequency or harmonic range. Also an automatic frequency control loop is employed with the comparator to adjust the voltage control oscillator and this AFC loop has adjustable gain which is directly related to the frequency of the incoming signal to enhance the stability over the entire frequency range. The system is also capable of an instantaneous determination of locked operation whereby false readings are avoided. [A4079]

"Bi-static radar speed sensor"

A doppler speed sensor for a ground vehicle wherein errors due to perpendicular velocity and vehicle tilt relative to the ground surface are substantially eliminated by utilization of a first receiving antenna having a radiation pattern disposed facing forwardly and covering a portion of the ground surface, and a second receiving antenna having a radiation pattern disposed facing rearwardly and overlapping the first antenna radiation pattern on the ground surface portion. [A4080]

"Complex pulse repetition frequency generator"

A complex pulse repetition frequency generator for producing a pulse repeion frequency (PRF) signal having programmable stagger intervals. The device consists of a clock for selecting one of a series of standard clock pulses which are used to increment a counter. A comparator compares the accumlated clock pulses with a stagger data output signal produced by a data memory source. When the outputs are equal, the comparator produces a PRF output pulse. Two data memory bands are provided, a random access memory in which stagger data can be programmed by a series of switches, and a preprogrammed read-only memory. Address counters are used with each memory unit and provide capability for addressing selected memory locations from the data memory sources. A pulse width generator allows the operator to vary the pulse width and utilizes an injection lock oscillator to prevent jitter whenever a standard clock pulse is used which is not an even multiple of a hundred nanoseconds. [A4081]

"Alarm system for emergency braking"

In a vehicle an alarm issues a warning signal just before actuation of an automatic emergency brake which operates in response to the relative speed and relative distance beween the vehicle and an obstacle in the vehicle's path. [A4082]

"Measurement of contents of tanks etc. with microwave radiations"

A microwave signal that varies linearly in frequency through a sweep period is radiated to and reflected back from a target body. In one mixer the directly generated signal is mixed with the reflected signal to produce a difference frequency corresponding to distance, another mixer mixes the directly generated signal with the same signal delayed for a constant time, to produce a reference difference frequency. Each difference frequency is digitized as a pulse train. The sweep period is divided into successive short time intervals, each of which can begin with a pulse of the lower frequency train and to each of which is assigned a numerical weighting factor, said factors for successive intervals differing stepwise in value. Pulses of each train occurring during each such interval are multiplied by the factor for the interval. All such multiplied pulses are counted through the sweep period to obtain a pair of pulse totals, and a quotient relationship between those totals gives an accurate measure of distance. [A4083]

"Microwave level gaging system"

A method and apparatus for measuring liquid level. A generated broad-band swept-frequency C.W. microwave signal (2-4 GHz) is upverted to a high frequency band signal (34-36 GHz) , which is transmitted towards, and reflected from, a liquid surface. The reflected signal is downverted to the frequency band of the original generated signal, and then the phase difference between the original and downverted signals is measured by a microwave phase discriminator and a quantizer, which generates video pulses proportional to the total phase shift across the swept C.W. band. During an adjacent sweep in the same direction, the original signal is compared with a signal transmitted through a calibration cable equivalent to a known free-space path length. The unknown signal path to and from the liquid surface, can then be calculated by comparison of the video pulse train outputs during the CALIBRATE and OPERATE modes of operation, either by the ratio of the number of pulses, or the average time between pulses during each sweep. Alternately, the mode of operation can be switched several hundred times during a single sweep across the bandwidth, and the unknown signal path corresponding to a particular liquid level can be calculated by comparison of the spacing during adjacent CALIBRATE and OPERATE modes to give several hundred measurements at different frequencies. Deviate measurements can then be eliminated, and the remaining measurements can be averaged to give a highly accurate true average measurement by known methods. [A4084]

"Automatic transponder"

A method and apparatus for the automatic, remote measurement of the internal delay time of a transponder at the time of operation is provided. A small portion of the transmitted signal of the transponder is converted to the receive signal frequency of the transponder and supplied to the input of the transponder. The elapsed time between the receive signal locally generated and the receive signal causing the transmission of the transmitted signal is measured, said time being representative of or equal to the internal delay time of the transponder at the time of operation. [A4085]

"MTI clutter tracking and cancelling system"

A clutter tracking and cancelling system, for use in a MTI radar system, comprising an auxiliary channel consisting primarily of a phase detector and a canceller. The phase detector provides an output which represents the phase difference between the IF and the coho output, while the output of the canceller, which responds to the phase detector output, represents clutter MTI residue from one transmission to the next. Clutter MTI residue from several successive range bins is smoothed and integrated to provide a control output which is used to shift the phase of the coho frequency, which is supplied to the phase detector in the conventional main MTI channel, to set the mean clutter velocity at zero velocity in order to produce optimum clutter cancellation in the main MTI channel. [A4086]

"Sea clutter reduction technique"

A multi carrier-frequency pulsed radar system in which each carrier-frequy reflected radar signal is separately processed by parallel receiver branches. The output of each receiver branch is multiplied together to form the product of the separate receiver outputs, which product is then displayed on a plan-position-indicator (P.P.I.) display. [A4087]

"Method of measuring the velocity of an object relative to a reference and a device for effecting said method"

Method and apparatus for measuring the velocity of an object relative to a reference by means of signals that are transmitted and received by transmitters and receivers fixed to the object at a certain geometric distance from each other in the direction of measurement, signals being transmitted by the object and being reflected by the reference. The receivers set up signals which correspond to the auto-correlation and cross-correlation of the received signals, the correlation signals being functions of the transmitter-receiver system geometry and being substantially independent of the reflection properties of the reference. The auto-correlation and cross-correlation signals are operated on to determine a time shift therebetween which is a function of the displacement of the object over a given period of time, the velocity of the object relative to the reference location being determined from said time shift. [A4088]

"Installation for controlling a measuring beam and/or a light beam in motor vehicles"

An installation for controlling a measuring beam and/or a light beam in motor vehicles, in which at least one measuring and/or light beam transmitted from the vehicle serves for measuring the distance or illuminating objects which are located ahead of the vehicle in its own lane, measuring devices are thereby arranged in the motor vehicle which determine at least the vehicle velocity and the transverse acceleration as well as possibly the longitudinal acceleration or deceleration for correcting the assumed theoretical braking action and, under certain circumstances, still other relevant vehicle magnitudes, the beam transmitter is then controllable as regards the beam range and/or beam opening angle and/or angle deviation of the beam with respect to the vehicle longitudinal axis by a computer as a function of these measured values. [A4089]

"Radar contour edge restore circuit"

Contour correction circuitry is provided for use in a weather radar which has iso-contour circuitry and which has a digital display having a tendency to undesirably not display the trailing edge boundary, for example, of a storm cloud. The correction circuitry is responsive to even a momentary signal indicating the close of a contour for forcing a contour boundary to appear on the digital display. The correction circuitry also enhances the texture of the radar when displaying snow flurries, ground returns, etc. which exhibit unique pattern characteristics. [A4090]

"Multiple ranging DME"

A method and system for obtaining and displaying distance information to multiple DME ground stations using a single airborne transmitter-receiver and for displaying groundspeed to one of the stations. A DME is time multiplexed between two channels and display-memory means, the distance value being held in the display corresponding to each channel until that channel and the display corresponding thereto is updated or until a predetermined period of time has elapsed. Further, a DME which provides a distance data output in both search and track modes is multiplexed between primary and secondary channels and display-memory means, and is permitted to go into track on the primary channel but only into search on the secondary channel. When the system is on the secondary channel appropriate information is stored and the DME is returned to primary channel operation in the track mode. [A4091]

"Short-pulse non-coherent MTI"

A non-coherent, non-doppler, MTI radar system has its cancellation notch adened to include a selected range of target velocities. The apparatus includes a transmitter/receiver for transmitting and receiving short pulses in the nanosecond range. Also included is apparatus for generating multiple MTI responses having cancellation notches at different target velocities and multiplying the responses together to obtain a broadened cancellation notch. [A4092]

"Digital mean clutter doppler compensation system"

A digital technique is disclosed for filtering clutter in a pulse doppler I radar which allows a filter notch to be set for different doppler frequencies. In particular, the system includes two or more MTI filters cascaded to cancel different kinds of clutter signals that interfere with target signal reception. In each filter a digital detection circuit senses the mean-clutter-doppler frequency for a particular clutter type and automatically places a notch at that frequency. Each notch is fixed by treating the radar samples as complex numbers and replacing the conventional filter coefficients with complex coefficients indicating amplitude and phase as derived from the radar returns. [A4093]

"Temperature compensated acoustic surface wave device"

A temperature compensated acoustic surface wave device, such as a surface wave delay line is provided in which temperature compensation is provided by the deposition of an interdigital electrode structure on a substrate with an overlay film surface of piezoelectric material of a predetermined thickness. A double substrate arrangement is also disclosed in which the interdigital electrode structure is deposited upon the surface of a non-piezoelectric layer which in turn is placed upon the surface of a piezoelectric substrate. [A4094]

"Object detecting system"

1. A system for detecting the movement of a remote object comprising trantting means for illuminating said remote object with a signal of wave energy, receiving means for recovering an echo reflected by said object, signal display means responsive to said echo to provide a separate visual display of each cycle of said reflected echo, and frequency comparing means responsive to a difference in frequency between the wave energy of said received echo and the wave energy of said transmitted signal to vary the orientation of said visual indication from a

reference orientation, whereby a variation in said orientation will provide an instantaneous indication of a doppler effect on said transmitted wave energy. [A4095]

"Airborne moving-target indicating radar system"

Radar detects relatively low velocity moving ground targets having relatively tiny radar cross sections, although the radar itself is moving at relatively high velocity with respect to ground. This is achieved with the use of spectrum tracking means and range-gated filters incorporated in the radar detecting means. [A4096]

"Noise resistant zone penetration detection system"

A system for detecting the existence of a projectile within a penetration ne of a target and providing a score indication for each projectile penetrating that zone. The system utilizes a doppler signal generator, a doppler cycle detector and an intercept detector for indicating penetration. A voltage controlled oscillator in the target area provides signal information for transmission by FM telemetry. The unit for scoring the number of intercepts utilizes an FM telemetry receiver for demodulating the signal information. A hit indicator produces a score indication pulse in a manner which is highly resistant to background noise. A score indication device, controlled by the control pulse, counts the score indications and signifies intercepts by an electromechanical counter, audible signals and/or a light display. [A4097]

"Muzzle velocity chronograph"

A chronograph uses a Doppler radar technique to determine the muzzle velocity of a bullet discharged from small arms such as pistols and rifles. A radar unit is placed in near proximity to the firearm to track the bullet while it is still relatively close to the muzzle. The radar unit is equipped with an antenna which is insulated from the sonic disturbance created by the firearm blast by sonic damping means formed exteriorly on the antenna. Measured spacing and orientation of the antenna with respect to the firearm diminishes the sensitivity of the antenna to the electromagnetic disturbance associated with the firearm blast. Doppler signal processing means are also disclosed. [A4098]

"Antenna for underground pipe detector"

An apparatus and method wherein an electrial impulse source transmits a radar-type signal through an antenna into the ground and is reflected by a target. The reflected signal or echo is detected by the antenna and an analog-to-digital converter converts it to a digital form which may be readily operated on, stored and recalled. A memory stores the information until recalled for comparison with a subsequent signal to give an indication of the location of metallic and non-metallic buried targets. [A4099]

"Passing vehicle signalling apparatus"

This disclosure pertains to a signaling apparatus installed within a movable large vehicle, such as a truck. Two sensing heads are utilized by mounting one of each on the frontmost opposed sides of the vehicle. Each sensor is manually selectively energized so as to detect the distance separating a vehicle being passed from the equipped vehicle on the side of the energized sensor. The sensors may utilize sound, radio or light waves to operate a conventional range detecting apparatus. A comparetor circuit compares the range of the vehicle being scrutinized with the range manually predetermined by setting a minimum range control element. A warning light continues to indicate the proximity of the scrutinized vehicle until such time that the vehicle remains within the pre-set distance manually selected by the operator. A timer may be used to shut off the sensing activity of the sensor in the event of intentional herding of adjacent vehicles oftentimes encountered in heavy traffic. [A4100]

"Vehicle position indicator with radar interrogation each of spaced transponders disposed along a pathway for the vehicle"

This invention applies to an automatic train control system. A low power radar mounted beneath a train interrogates simple passive transponders mounted between the rails. Each transponder includes a reflective delay line. The radar has a number of range gates. The transponder delays are arranged in a simple code which provides information as to the location of the train along the track. The outputs of the range gates can be fed to a simple computer which can also receive wheel revolution pulses from an axle mounted transducer. The computer can then calculate the distance travelled at any given moment to within one meter from the last transponder over which the train has passed. [A4101]

"Collision avoidance/proximity warning system using secondary radar"

Proximity indication and evaluation of mobile vehicles, using the signals emitted by the hundreds of existing secondary radar ground stations and the nearly 100,000 cooperating transponders on the vehicles, to detect intrusion in a monitored proximity volume and to determine slant range and/or relative bearing to the intruder. [A4102]

"Traffic control system"

A traffic control system particularly suitable for aiding the blind includes an interrogating FM radio transmitter-receiving unit, which can be incorporated into a cane or the like, and a responding FM radio receiver-transmitter unit operatively associated with the traffic signal light control circuits at a street intersection. The interrogating unit transmits an FM signal modulated by a coded signal indicative of which direction its blind operator wishes to cross the intersection. The responding unit, in response to the FM signal received from the interrogating unit, transmits an FM signal modulated by a coded signal corresponding to that received from the interrogating unit whenever the traffic signal light conditions are such that a safe crossing in the desired direction is possible. The interrogating unit produces an audio or mechanical output signal when the coded signal received from the responding unit corresponds to the coded signal it transmitted under the control of its blind operator, this output signal indicating that it is safe to cross the intersection in the desired direction. [A4103]

"Imaging systems"

Echo data relating to the distance away of reflective elements of an object surface is received by an array of receivers. A signal processing device receives the data and together with information as to the range of the object surface defines equitime loci of the object surface corresponding to the data. Image elements are displayed at positions in an image plane corresponding to the intersections of the equitime loci. [A4104]

"Signal modification techniques"

Signals producing each spot in a digital two-dimensional spot matrix display, such as in a digital weather radar, are compared on a spot-by-spot basis with signals for immediately proceeding and following spots in each dimension. When the preceding and following spots have the same value, the spot being compared is caused to have that same value when displayed. The comparing circuitry may be provided signals from a radar antenna which receives, serially, signals at succeeding range points at a given azimuth and then at the same range points at succeeding azimuths. Signals at each given range at a plurality of succeeding azimuths may be averaged to produce an improved visual display. The compared signals may be further smoothed by averaging signals for succeeding azimuths and displaying the averaged signals alternating with the unaveraged signals. [A4105]

"Traffic radar and apparatus therefor"

Apparatus is provided for determining the frequency of unknown periodic input signals and primarily generally sinusoidal signals which may be accompanied by substantial noise. More particularly a unique traffic radar or doppler radar is provided employing such frequency measuring apparatus. The apparatus includes a phase locked loop in which a frequency multiplier effect is produced and in which a frequency 12 times the periodic input signal being subjected to measurement is employed for taking two independent samples of the input signal and providing a synthetic representation of that signal. The two samples are centered about quadrature time references and are preferably conterminous. This signal can be measured and utilized for speed measuring purposes and other purposes where the accurate measurement of a periodic signal accompanied by noise is desired. The system includes two sampling gates to control the frequency of a variable controlled oscillator in a manner which accurately matches the oscillator output to a harmonic of the input and selects portions thereof to eliminate harmonic ambiguities. Circuit means is also provided for signal verification and for improved long-term noise rejection by utilizing variable time constants. [A4106]

"Testing of automobile headlights"

A machine which surveys the focussing of motor vehicle headlights, said surveying accomplished by the invented machine using an existing light-sensitive element and in correlation with a radar detecting system. [A4107]

"Method and system for measuring doppler frequency shift of an echo"

A beam of diverging electromagnetic radiation of a predetermined frequency is transmitted to a target and the doppler shift of frequency of an echo due to relative movement of the target and a point of reception is detected conventionally by combining the frequency of the echo and the predetermined frequency. The number of cycles within the detected doppler shift frequency is counted to provide a delay to initiate measurement of doppler shift at a preselected angle of incidence of the echo. The effective area of measurement is thus restricted to a narrow region of the beam with the resultant high degree of precision. [A4108]

"Method for avoiding unwanted echo signals and automotive radar embodying same"

An automotive radar is provided with a device for sensing the location of the entry and exit ways of a zone as the vehicle passes therethrough to reduce the detectable range of the radar upon the vehicle entering the zone so that false targets within the range-controlled zone are discriminated from valid targets. The device restores the range upon the vehicle leaving the zone to normal range. [A4109]

"Multiple target data receiver for a collision avoidance system"

In an interrogation vehicle, a receiver of data from a plurality of remote vehicles such as aircraft or maritime vessels in a cooperative collision avoidance system is arranged to receive such data reply signals in reply to interrogation signals. The reply signals are suitably coded in the remote vehicles to provide information in a predetermined plurality of sequential replies from each replying vehicle. [A4110]

"Method and apparatus for acousto-optic pulse compression"

There is disclosed a pulse processing method and apparatus for compressing or changing the time scale of signal information represented by the modulation of a pulse of carrier energy which method and apparatus utilizes a crystal through which both a pulse of radio frequency acoustic energy and a pulse of polarized optical energy are simultaneously and colinearly transmitted to scatter energy in the optical pulse from one polarization state into the orthogonal polarization state. The crystal output is thus comprised of two optical pulses. One is the pulse having the original state of polarization and the other is the pulse resulting from the energy scattered to the orthogonal polarization state. The optical energy of rotated polarization is modulated in a fashion reproducing the modulation of the ultrasonic wave by which it is scattered. Furthermore, a short optical pulse can pass through the ultrasonic wave in a time short compared to the duration or length of the ultrasonic wave in the crystalline device. In so doing it reads the modulation of the acoustic pulse and transfers it to a time compressed pulse scale on the scattered optical output pulse. It is shown that the compression ratio is equal to the ratio of the velocity of light divided by the product of the velocity of sound in the crystal times the absolute value of birefringence of the crystal. If both the optical and acoustic pulses are passed through the crystal colinearly and in the same direction, the device takes a time function represented by the acoustic pulse, reverses it in time and compresses it by the ratio of light velocity to sound velocity thus producing a compressed inverse function. If the acoustic pulse and the light pulses are transmitted through the crystal colinearly but in opposite directions, the device takes a time function and without reversing it, compresses it in substantially the same ratio. The device may be applied, for example as a means of improving the signal-to-noise ratio, detection ratio and range resolution in radar systems or the like. [A4111]

"Digital MTI radar"

A digital MTI radar wherein, after an initial period, differences between the composite video signal of a present range sweep and a prediction of the composite video signal of such range sweep are digitized by an analog-to-digital converter. [A4112]

"Method and apparatus for interrogating and identifying fixed or moving targets"

Hijacked vehicles, or the like, are identified by illuminating a transpon mounted to the vehicle by a beam of microwave energy, e.g., from a helicopter flying over the traffic. The transponder includes non-linear diodes which reradiate a signal back towards the helicopter. Means are disclosed for modulating the return signal with a 16-bit identification code, each bit of which is transmitted as a 31-bit pseudo-random code. [A4113]

"Radar detection of turbulence in precipitation"

A technique for processing the IF portion of a radar return signal in order o provide the remote detection and measurement of atmospheric turbulence occurring within precipitation. The technique employs an amplitude limiter, a wideband discriminator and a video amplifier to provide real time measurement of the precipitation velocity. A velocity comparison at various radar ranges is made to provide an indication of the turbulence. The analog circuit employed to make this measurement operates with high speed and is capable of being used with any pulsed (coherent or non-coherent) weather radar. [A4114]

"Real time analog doppler processor for weather radar"

A technique for processing the IF portion of a radar return signal in order o produce a continuous voltage output which voltage is proportional to the instantaneous frequency of the received signal. The technique employs an amplitude limiter and a wideband discriminator comprised of a delay line and phase detector followed by a video amplifier for processing the desired output signal. The output signal is indicative of velocity of precipitation in the radar target range. This information may be employed to detect and measure the degree and intensity of precipitation fall velocities, winds within a storm and other velocity dependent characteristics. [A4115]

"Radio-frequency direction-finding arrangement"

A scanning radio-frequency direction finder which includes two synchronously scanned beams (antenna patterns) having their boresite (symmetry) axes angularly offset by a predetermined amount, either physically or by control of time of operation. A first of the beams is double-lobed with a null at its boresite while the second has its maximum at its boresite. The signals received through each pattern are continuously phase measured and the phase of signals through the second beam is stored when the received signal strength therethrough reaches a predetermined value. The continuously measured first beam signal phase is compared with the aforementioned stored second beam signal phase, the instantaneous scan angle of the first beam at the time of phase equality being taken as the correct angle of the target reflector or source of received signals (target) . The result is much improved angle measurements, especially in elevation at low angles. [A4116]

"Radar speedometer"

The speedometer is for use on a vehicle such as an automobile or train for providing a continuously updated digital reading of vehicle speed and a cumulative digital reading of total mileage traveled. By means of a front end transmitter-receiver antenna arrangement, a signal is provided, the frequency of which corresponds to velocity of the vehicle. This signal is coupled to a novel duty cycle detector which essentially rejects spurious noise signals and passes only signals of a predetermined duty cycle. A true signal is passed to a signal stabilization circuit which is responsive to the frequency of the signal for essentially replacing lost signal pulses. The pulse signal which is representative of vehicle speed is then coupled to both the odometer counter for ultimately providing a reading of mileage traveled and to the speedometer counter for ultimately providing a reading of vehicle speed. [A4117]

"Multiple rate digital command detection system with range clean-up capability"

A multi-rate digital command system is disclosed which uses the composite signal of a .mu.-type ranging system as a subcarrier to transmit range codes and data from a station to a receiver where the range codes are sequentially phase modulated on a subcarrier of frequency f.sub.sc by one of its own subharmonics as follows: and data is phase modulated on a selected ranging component, C.sub.i, where i is a number selected from the sequence 1, 2 . . . n in which the ranging components are transmitted. A range cleanup loop in a spacecraft locks the phase of a locally generated reference component C.sub.i to a received ranging component C.sub.i and retransmits the component to a ground station. When the inverse phase, C.sub.i, of a ranging component is received and detected, the cleanup loop is modified to demodulate phase modulated command symbols while continuing tracking the same ranging component C.sub.i. The command symbol rate is coherently related to the ranging signal component bit rate. [A4118]

"Variable range automotive radar system"

An automotive ranging and detecting system wherein clutter returns from out of lane objects at curves in a road are eliminated by adjusting the maximum range of the radar in accordance with the radius of curvature of the path of travel of the vehicle. BACKGROUND of THE INVENTION 1. Field of the Invention The present invention relates to collision avoidance radars, and more particularly to a ranging and detecting system for an automotive radar. 2. Description of the Prior Art Conventional non-cooperative radar detecting and ranging systems, wherein a probe signal is transmitted towards a target and is "skin"-reflected therefrom back to the interrogating unit, have typically been impractical for utilization as automotive collision avoidance systems due to undesired signals known in the art as "clutter." Clutter returns from extraneous targets such as fixed objects along a roadway or moving vehicles in non-critical spatial relationships to the interrogating vehicle, for example, vehicles in another lane, are not distinguishable from reflections from targets in critical relationship to the interrogating vehicle. Clutter returns thus cause a false alarm problem whereby driver alert indicators, automatic braking, or passenger restraints, such as air bags, may be inopportunely employed. The majority of clutter returns occur when a vehicle is traveling along a curving road and receives returns from vehicles in non-critical adjacent lanes and stationary targets along the shoulder of the road. for a more detailed discussion of such clutter problem, reference is made to Department of Transportation Report DOT HS-801 011 "Analysis of Problems on the Application of Radar Sensors to Automotive Collison Prevention", Wood, Chandler, and Warner, Final Report, December 1973-Contract DOT-HS-314-3-601. To reduce road curve clutter, systems have been proposed wherein the radiation pattern of the radar probe signal is changed in direction in accordance with the position of the steering wheel. However, oversteer or understeer in the steering mechanism make such a system impractical. In addition, even if the probe signal were properly directed, the clutter would not be eliminated, but rather only reduced. Such systems are referred to in the above-mentioned DOT report by Wood, Chandler and Warner. Cooperative systems, wherein the radar is responsive only to specifically tagged targets which tagged targets are capable of generating a reply signal that is in some way distinguishable or discriminated from radar probe signals and from skin reflections, are not subject to clutter. Such a cooperative detecting and ranging system is disclosed in U.S. Pat. No. RE.28,302 to Staras et al., issued Jan. 14, 1975. Cooperative systems, however, do not respond to untagged targets or to targets having inoperative tags. Hence, the efficacy of cooperative systems as automotive detecting and ranging systems is dependent upon acceptance and use of the system by the driving public at large and upon proper maintanance of the tag. The above-mentioned copending application "Dual Mode Automobile Collision Avoidance Radar" by Sterzer and Kaplan, Ser. No. 593,016 describes a dual mode system comprising a continuous wave frequency modulated (FM-CW) radar which responds to reply signals from tagged targets and to skin reflections from proximate untagged targets, reducing thereby the radars sensitivity to clutter. Such a dual mode system, however, is at long ranges responsive to only tagged targets. Accordingly, a non-cooperative radar system wherein clutter returns from targets outside of the lane of travel of the interrogating vehicle are ignored is desirable. SUMMARY of THE INVENTION The present invention provides a vehicular ranging and detecting system wherein the maximum range of the system is altered in accordance with the radius of curvature of the travel of the vehicle to eliminate thereby clutter from out of lane targets. [A4119]

"Simplified digital moving target indicator filter"

A digital filter for generating a frequency domain output signal in response to an incoming signal arriving in successive receiving cycles whenever the incoming signal has any frequency component lying within the passband of the filter. A means for generating a timing signal is provided. An analog-to-digital converter responsive to the timing signal converts the incoming analog signal into a series of digital input pulses during each range gate interval. A reference generator responsive to the timing signal provides a train of digital reference pulses for each of the successive receiving cycles. A predetermined number of successive receiving cycles constitutes a single correlation frame. The amplitude of each train of digital reference pulses is determined by a composite correlation function. A multiplier multiplies each digital reference pulse with each digital input pulse to generate a train of discrete digital output pulses for each receiving cycle. An accumulator stores the discrete digital output pulses from the multiplier and generates a frequency domain output signal for each frame of reference pulses. The digital filter can also be constructed with either a two-channel or four-channel processor to provide a more sophisticated filter system. [A4120]

"Systems for the detection of moving objects within a survey area by microwave diffraction"

A microwave transmitter and receiver are placed at a distance from each other to define between them a survey area in which the field of transmission is modified by reflection and/or absorption by objects in the survey area. A modulation generator is used for controlling modulation in the transmitter and for controlling the cycling period of a commutative filter in the receiver in accordance with the modulation period, thereby automatically tuning the receiver to the transmitter. The receiver further comprises an alarm unit which analyses the signal admitted through the commutative filter and strikes an alarm in response to such changes of that signal as are caused by the presence of moving objects in the survey area. [A4121]

"Marine radar transmission and reception system"

A marine radar transmission and reception system in which first and second transmission pulse radar waves are emitted as first and second pulse radar waves from first and second radar antennae or a common radar antenna, reflected waves of the first and second emitted pulse radar waves are received as first and second received pulse radar waves by the first and second radar antennae or the common radar antenna, the modes of the first and second transmission pulse radar waves are selected in cooperation with those of the first and second radar antennae or that of the common radar antenna so that the first and second received pulse radar waves may be received by the first and second radar antennae or the common radar antenna independently of each other, a quotient or difference output corresponding to the quotient or difference of the first and second received pulse radar waves or the first and second received outputs based thereon is obtained, and sea clutter eliminated received pulse radar waves or outputs based thereon that signal components of the period--in which the quotient or difference output exceeds one predetermined threshold value or lies between two threshold values--are eliminated or suppressed, are obtained. [A4122]

"Correlator to reduce bin straddle in a collision avoidance system"

In a cooperative collision avoidance system the detected reply signals to interrogation probe signals are correlated by a digital circuit that processes all the reply signals identifying targets over non-targets ("fruit") . The correlator is capable of detecting all targets in any desired range during a given correlation period and is provided with means to reduce the effect of bridging or straddling adjacent bins in the correlator to minimize thereby the duplication of detected replies which would overload the following processor and cause loss of desired replies. [A4123]

"Signal processing in short-pulse geophysical radar system"

Signal processing techniques and apparatus for use in short-pulse geophysical radar systems to improve signal-to-noise ratio, reduce r.f. interference, improve resolution and reduce ambiguities. [A4124]

"Underground, time domain, electromagnetic reflectometry for digging apparatus"

An apparatus for detecting the presence of a buried, hidden object in the vicinity of a digging tool in order to prevent a human disaster and damage to utility lines or other buried structures. The apparatus includes an impulse generator and data processing means connected to a slot antenna formed in the tool of an earthmoving machine for radiating a burst of broad spectrum electromagnetic energy into the ground and for receiving and data processing reflected electromagnetic echoes. One antenna embodying the invention comprises a slot formed through a wall of a hydraulically driven shovel and filled with a ceramic absorber. The slot has four radially extending, orthogonally arranged loops having unclosed central portions of the loops joined end to end to form four apexes. [A4125]

"Pulse coherent transponder with precision frequency offset"

A radar reply transponder for use with existing radar tracking systems wherein a reply pulse is generated and trasmitted in response to an associated interrogation pulse. The reply pulse is delayed in time and offset in frequency by a precise amount with respect to the interrogation pulse, but it is nevertheless phase coherent therewith so as to preserve the required Doppler frequency information and thereby permit accurate velocity measurements. Phase coherence is effectively maintained by utilizing a single continuously operating local oscillator for down-converting the received interrogation pulse to an intermediate frequency as well as up-converting the signal information to provide the delayed and frequency offset reply pulse. The precision frequency offset is obtained by switching in an additional reactance element in the oscillator-determining circuitry during the time up-converting is being effected. The radar transponder may thus be used in a high-vibration environment with no substantial introduction of error in velocity measurements caused by using two independent oscillators to formulate the frequency offset. [A4126]

"Frequency spectrum analyzer"

A frequency spectrum analyzer adapted for use in a real time signal processing radar system is disclosed. In such system a plurality of sets of radar returns, each one of such sets corresponding to radar returns from objects disposed in each one of a like plurality of range cells, is stored in a time compressor section, the radar returns in each one of the sets thereof being stored at the pulse repetition frequency (PRF) of such radar system. After storage of such radar returns, a like plurality of chirp pulses is produced, each one of such pulses having a dispersive time K.tau.. Synchronously with each one of the chirp pulses, one of the plurality of sets of stored radar returns is retrieved from the time compressor section, in a time duration equal to K.tau.. Each one of the retrieved sets of radar returns is mixed with a corresponding one of the plurality of chirp pulses to produce a series of mixed signals which is coupled to a pulse compressor. Each one of the mixed signals is compressed into a pulse occurring at a time related to the Doppler frequency of any object in the range cell producing such associated radar returns. The time compressor section is used prior to pulse compression to effectively "match" the radar dwell time, generally several milliseconds in duration, to the dispersive time of the chirp pulse, generally several microseconds in duration, thereby enabling the pulse compressor to include a practical surface acoustic wave (SAW) delay line. Further, the "compressive" bandwidth, .beta., of the pulse compressor is equal to, or greater than, the dispersive bandwidth of the chirp pulses, thereby to maximize the power in the compressed pulses. Means are provided to adjust the dispersive time of the chirp pulse, thereby to correspondingly adjust the effective number of frequency resolution cells of the frequency spectrum analyzer. [A4127]

"Mine detector system"

A mine detector system that utilizes an explosive comparator to increase sensitivity and selectivity. The system utilizes a generator to transmit a signal simultaneously toward the area to be scanned for mines and towards a sample of the explosive sought. Detectors are positioned within the device to receive the reflected signals from both the area to be scanned and the sample explosive. The outputs from both detectors are fed to preferably a null type comparator for correlation. When the two signals correlate, mine presence is indicated. [A4128]

"Target adaptive radar system"

A radar system transmitting a signal of given carrier frequency which is quency modulated at a given rate and wherein the nature of the target return is utilized to eliminate sea and ground clutter. The reflected signal from a hard target has a unique modulation imposed on it by the interference of the incident and reflected waves and this unique modulation is converted to the modulated voltage thereby permitting the use of a video amplifier having a narrow bandwidth. [A4129]

"Digital prefilter for clutter attenuation in MTI radars"

In a digital moving target indicator (MTI) employing digital filters for rejecting low frequency clutter signals having magnitudes which are 20 to 60 db greater than the moving target return signal, the dynamic range and resolution accuracy requirement of an analog-to-digital (A/D) converter, used to convert the return radar analog video signal to a plurality of digital signal equivalents for presentation to the digital filters, is reduced from that normally required by prefiltering the return video signal through a prefilter network. The digital prefilter utilizes: a low resolution accuracy (low order bit capacity) analog-to-digital (A/D) converter to convert the return analog video signal (comprising both low frequency clutter and high frequency moving target component signals) to a digital signal, a low-pass digital filter to pass only the low frequency clutter signal, a digital-to-analog converter to reconvert the digital clutter signal to an analog clutter signal which is substantially equivalent to the clutter component signal value of the analog video signal, and a summing circuit which provides an analog sum signal representative of the amplitude difference between the analog clutter signal and the return analog video signal, to provide a video signal with a greatly enhanced moving target to clutter signal ratio. The sum signal is presented to the system A/D converter, permitting the use of a low resolution system A/D converter having a substantially reduced dynamic range and lower cost, the system A/D converter providing the digital equivalent signal of the enhanced return video for further processing in the digital MTI filters. [A4130]

"Full range correlator for use in a collision avoidance system"

In a cooperative collision avoidance system, the reply signals to interrogation probe signals are correlated by a digital circuit that processes all the reply signals identifying targets over non-targets or "fruit." The correlator is capable of detecting all targets in any desired range during a given correlation period. [A4131]

"Pulse radar apparatus"

Pulse radar apparatus provided with a control circuit comprising at least an error voltage generator, a dither-tuned magnetron and a servo unit driving this magnetron, and also with a conditional circuit and an angular position indicator connected to the servo motor shaft for tuning the magnetron frequency f.sub.z to a frequency f.sub.zo, showing a fixed difference f.sub.o with the local frequency f.sub.lo, where f.sub.o = f.sub.zo - f.sub.lo. When, by means of the indicator, the conditional circuit determines that the magnetron is being tuned in a defined frequency range comprising the frequency f.sub.zo, the auxiliary voltage (V.sub.1) , used to coarse tune to frequency f.sub.zo is replaced by a fine tuning error voltage proportional to .vertline.f.sub.z - f.sub.lo .vertline. - .vertline.f.sub.o .vertline.. This error voltage is delivered by the generator supplied with the local oscillator signal and a sample of the magnetron pulse. [A4132]

"Electronic license plate for motor vehicles"

An electronic license tag or plate formed into a unitary structure and including a single antenna system cooperating in a system comprising a harmonic radiator which transmits a pulse coded identification signal in response to an interrogation signal, and in a signal communication path for detecting and decoding code modulations in the interrogation signal and deriving therefrom an information signal which is communicated to the operator of a vehicle to which the tag or plate is affixed. [A4133]

"Four beam printed antenna for Doopler application"

A novel approach for generating four symmetrically located beams from a printed antenna using a corporate feed system is described. One approach used to generate four low side lobe beams utilizes a planar aperture. The second approach generates four low side lobe beams from a cylindrically shaped aperture. The generation is accomplished without the use of active phase shifting devices. The output phase function of the feed can be reversed which causes the beam to be pointed equally in the opposite direction. The radiating elements are designed to be symmetrical about the center of the aperture in a direction orthogonal to the radiating elements. By placing identical feeds at both ends, four beams can be obtained, each pointed in a direction symmetrically located about the normal to the antenna. Such an approach is applicable to both planar arrays and cylindrically shaped arrays. [A4134]

"Semipassive responder utilizing a low voltage, low power drain reflective varactor phase modulator"

A semipassive responder for use in a communication system wherein an interrogating unit transmits an interrogation signal to illuminate the responder. The responder generates, in response to incident interrogation signals, a phase-coded reply signal, utilizing a low voltage, low power-drain reflective varactor phase modulator. [A4135]

"Pulse doppler proximity fuze"

1. An oscillator-detector circuit comprising operating potential energy rces, first self pulsing circuit means intermittently oscillatory for developing high frequency electromagnetic energy pulses of a preselected carrier frequency and repetition rate, electromagnetic energy radiating means electrically coupled to said first circuit for effecting radiation of said developed pulses into space and for receiving any reflected electromagnetic pulses, and a second oscillatory circuit means inductively coupled to said first circuit means and being rendered intermittently oscillatory during the occurrence of said developed pulses for selectively detecting variations in the magnitudes of said developed pulses caused by said reflected pulses and for developing an output signal having a frequency correlative to said variations, said first and second oscillatory circuits being parallel connected across said energy sources. [A4136]

"Doppler radar"

A Doppler radar for use in a vehicle for predicting a collision with another vehicle, capable of detecting noise due to a false wave i.e., the transmitted wave from another vehicle having a frequency in the vicinity of the true transmitted wave frequency and having entered through a receiver antenna into a mixer, and controlling the frequency of the true transmitted wave to depress said noise to zero, thereby avoiding the interference of the false wave with the Doppler signal output. [A4137]

"Optical tracking analog flywheel"

An optical tracking system wherein an analog computer program is operated multaneously with a real projectile firing. The program is forced to match its output of projectile position with real-time data. When no data is available, the analog program acts as a very sophisticated flywheel to keep optical tracking mounts continuously positioned very closely to the actual target position until it can be reacquired. [A4138]

"MTI canceller utilizing fiber optic delay medium and frequency reiteration"

A pulse cancellation system, particularly adapted to moving target indicator (radar) stationary signal cancelling equipment. A cancelling circuit which is basically a signal differencing device compares the signal train within a given scan cycle with that of the previous cycle by delaying the signals of said previous cycle in order to bring them into time coincidence in the canceller circuit. Delay is achieved in a stable electro-optical device by modulating a light source, preferably a laser beam, in accordance with the signal train to be delayed. Signals are passed through a fused silica fiber optic cable, detected at the other end of the cable, remodulated onto a source of a different optical frequency (color) and retransmitted back over the same fiber optic delay means. Several such reiterations can be effected to reduce the amount of delay required in the fiber optic cable. After the last such reiteration the final color transmission is detected and sent to the canceller to be subtracted from signals provided to the canceller directly from the MTI radar receiver output (undelayed) . [A4139]

"Pseudo pulse doppler radar"

An amplitude monopulse radar, in which quadrature sum and difference signals are processed in order to determine the magnitude and direction of antenna tracking angle error, utilizes coherent detection which clutter reference for moving target indication (MTI) operation. In the absence of clutter, point targets (both fixed and moving) are detected on a per-pulse coherent basis (as between the sum and difference, in phase and quadrature signal channels) using as a reference either signal channel noise or an oscillator nominally at the IF frequency. Both modes of operation are accommodated by using bandpass doppler filters which are convertible to low pass filters in order to permit zero-doppler signals relating to point targets to pass in the absence of clutter, the filter mode being selected by a point target discriminator which senses the presence of clutter in range bins straddling the signal range bin. The dual mode filter may consist of a high frequency, low pass filter and a low frequency, low pass filter, the presence of clutter causing the low frequency characteristic to be subtracted from the high frequency characteristic so as to form a bandpass filter. [A4140]

"3-Channel selectable polarization, target discrimination antenna"

A monopulse radar antenna having an improved three-channel feedhorn for piding selectable polarization and greater target discrimination. The antenna feed employs a comparator having a difference port, a first sum port, and a second sum port utilizing a coupling pin or probe therein, between the comparator ports and an adjustable polarization device, for receiving and separating returned energy which has become cross-polarized with respect to the polarization of the transmitting sum arm, by reflection from an asymmetrical target. The three-channel feedhorn makes possible the identification of different types of targets, and the detection of hidden targets in rough terrain, forests, underbrush, and rough seas. [A4141]

"Digital MTI radar system"

A digital MTI radar system is disclosed which is adapted to reject moving clutter returns and to pass, for detection and display, returns from moving targets. The radar system includes means for producing a series of complex digital words representative of the average moving clutter Doppler velocity at each one of a series of range cells. A canceller network is provided to modify the returns from a range sweep with the complex digital words and to combine such modified returns with the returns of a successive range sweep, thereby to effectuate the desired moving clutter rejection. [A4142]

"Communication apparatus for communicating between a first and a second object"

An improved communication apparatus for communicating between a first object and a second object wherein the first object includes apparatus for generating and transmitting a transmit signal and the second object includes apparatus for receiving the transmit signal and providing an emitted signal in response thereto, the emitted signal having a frequency coherently related to the frequency of the received transmit signal. The second object also includes an apparatus for encoding an identifying code having a unique code format wherein the beginning and the end of the code format are identifiable, the first object including apparatus for receiving the encoded emitted signal, identifying the code format encoded therein and determining the received emitted signal represents a valid code format. In one aspect, the first object apparatus receives encoded emitted signals via two receivers, identifies the code format encoded in the first-received and the second-received encoded emitted signals, determines that each received signal has a valid format encoded therein and compares the code formats encoded in the first-received and the second-received emitted signals to determine the signals were emitted via the same second object. In one operational embodiment, the communication apparatus transmits a transmit signal and receives encoded emitted signals from a moving second object in response to the received transmit signal at a first position and a second position of the second object, the first and the second received encoded emitted signals being determined to represent a valid predetermined code format and it being determined that the received code formats are identical, the speed and direction of the moving object being determined in response to such valid determinations, the code format encoded in the received emitted signals being compared with predetermined identification code formats for locating predetermined second objects. The first object apparatus also generates and transmits a modulation signal, the second object apparatus including apparatus for detecting the modulation signal via a pulse width detector and providing an output indication in response thereto. In one particular operational embodiment, the first object apparatus is utilized to detect and monitor vehicle traffic, each vehicle (second object) having apparatus for receiving the transmit signal and providing the encoded emitted signal in response thereto, and for receiving the modulation signal and providing a driver-perceivable output indication in response thereto. [A4143]

"Relative distance indicating speedometer for a vehicle"

There is provided a relative distance indicating speedometer for a vehicle comprising relative distance detecting means for measuring the relative distance of a vehicle carrying the speedometer with respect to an object such as the vehicle in front, and relative distance indicating means for indicating the measured relative distance in accordance with the output signal of the relative distance detecting means. The relative distance indicating means are arranged in the speedometer which indicates the speed of the vehicle, and therefore the apparatus of this invention is inexpensive to manufacture and simple in construction. [A4144]

"Homodyne communication system"

A homodyne communication system comprising an interrogating unit and a plurality of responsive remote units wherein a continuous wave RF signal is transmitted from the interrogating unit to illuminate a remote unit. The remote unit causes a return (reply) signal to be transmitted or reflected back to the interrogating unit. A sample of the transmitted (interrogation) signal is mixed with the return signal. Amplitude nulls in the mixer output signal at given relative phase relationships between interrogation and reply signals, are substantially eliminated by selectively shifting the relative phase of the signals. Also disclosed are a homodyne communication system utilizing phase modulation to impress FSK signaling on the reply signal and an automatic vehicle location system utilizing the present invention. [A4145]

"Moving target indicating (MTI) radar systems employing vehicle discriminator apparatus"

There is disclosed a radar system of the type employing a receiver capable f responding to a signal reflected from a moving target, which signal includes a doppler frequency component indicative of target motion. Included therewith are means for responding to an even harmonic component of said returned signal to provide an indication of the magnitude of the same, the magnitude of said even harmonic component indicative of the nature of said vehicle, as, for example, whether said vehicle is a tracked type (tank) or a wheeled type (automobile) . [A4146]

"Device for transmission of information from an information emitter to an information seeker"

A device for automatic transmission of information includes an information emitter and an information seeker wherein the information is transmitted from the emitter to the seeker in response to an interrogating signal from the information seeker. The emitter relies for transmission on energy which is extracted from the interrogating signal. The emitter is provided with several resonant circuits, each of which generates an information signal component. The information carrying signal comprises a multitude of such signal components. From the information carrying signal the information is captured by detection in the information seeker of the respective information signal components. [A4147]

"Object identification system using an RF roll-call technique"

An object identification system using an RF roll-call technique wherein an interrogator illuminates a multitude of cooperating objects with a sequence of codes and receives from each such cooperating object an acknowledge signal immediately following the transmission of the code associated with that object and which terminates prior to completion of transmission of the next code in the sequence. [A4148]

"Navigational and collision avoidance apparatus"

Marine surface radar processing equipment provides digitized target range pulses at a plurality of ranges, and includes target evaluation apparatus that comprises target leading edge signal means providing a target leading edge signal pulse at successive azimuths, and target trailing edge signal means providing a target trailing edge signal pulse at successive azimuths and initially separated in range from the target leading edge signal. The edge signal pulses describe a target envelope. The coincidence in range of a leading edge signal pulse and a trailing edge signal pulse provides a target envelope end recognition signal. The target evaluation apparatus further comprises discriminating means responsive to a maximum number of target leading edge signal pulses at successive azimuth intervals. The maximum number decreases at successively increasing ranges. The discriminating means discriminates between landmass targets of greater than a predetermined actual length in azimuth representing a maximum ship length, and possible ship targets of less than the predetermined actual length in azimuth. The discriminating means provides a discriminated target output signal responsive to possible ship targets of less than the predetermined length for display of ship targets with their speed and course vectors. [A4149]

"Pulse-type radar with modulated carrier frequency"

A radar system emitting a recurrent sequence of n equispaced bursts of carrier frequency, varying from one burst to the next, has a transmitter including a carrier-frequency generator with a frequency-varying motor driven by a synchronizing circuit to produce a repetitive frequency pattern recurring a whole number of times in a program cycle of n pulse periods. An associated receiver includes a local oscillator whose frequency is incremented, from one pulse period to the next, by a feedback circuit comprising a modulator with inputs connected to the output of this oscillator and to a coupler picking up the instantaneous carrier frequency from the transmitter output, this modulator works into a frequency discriminator, tuned to a predetermined intermediate frequency, returning an error signal to a control input of the oscillator via a multiple integrator concurrently storing all the error signals for the several pulse periods, an adder superposes these error signals upon a monitoring signal extracted at the beginning of each pulse period from the carrier-frequency generator. The multiple integrator includes an operational amplifier with n parallel capacitors in respective feedback paths which are normally open-circuited and are sequentially connected in circuit under the control of a shift register restarted at the beginning of each program cycle. A similar multiple integrator may be inserted in an automatic-gain-control circuit for an intermediate-frequency amplifier in the output of a mixer which heterodynes the received echoes with the local-oscillator output. [A4150]

"Range readout apparatus"

A range measurement system wherein range accuracies of fractions of a meter may be obtained. Nanosecond pulses, one triggered by the transmitter trigger with an appropriate delay and the other triggered by a received echo pulse, are launched from opposite ends of a transmission line. The location on the transmission line at which the two short pulses coalesce and the delay time of the transmitter triggered short pulse establish the range to the echoing object to an accuracy determined by the short pulse, pulse width. [A4151]

"Anti-collision vehicular radar system"

A radar system mounted on a vehicle and having an RF signal transmitted preferably in a confined beam in front of the vehicle and reflected from obstacles in the path of the beam to be reflected back to the vehicle. The system includes an asymmetrical magic tee which receives both the transmitted and received signals and provides a pair of Doppler frequency signals whose relative phase relationship determines whether the signal is an opening or closing Doppler signal. The signal employs a diplex Doppler detection scheme for providing both range and rate data. Under an imminent collision situation the system provides control signals to power means for pulsating the brakes of the vehicle to thereby avoid a collision. To minimize false target detections and to provide target discrimination, there is provided in this system both a range gated circuit for detecting normal closing rates and an amplitude gated circuit that is operable primarily for detecting fast closing rates such as may occur when a vehicle is stopped in the roadway. A ground speed detector is provided and has an output analog voltage which is usable as a gain control voltage for the range and amplitude gated circuits. The system is also provided with means for inhibiting braking action below a predetermined vehicle speed for use in slow traffic, and means for altering the braking action at speeds above a predetermined speed such as on the order of 35 MPH. [A4152]

"Velocity sensing apparatus"

Velocity sensing apparatus which permits measuring the velocity magnitude and sense of direction using the single radiating antenna illuminating a spot on the ground from which power is back-scattered to three receiving antennas. The receiving antenna outputs are grouped into pairs and processing of the signals done to obtain direct sum and quadrature sum waveforms with the point of crossing of the spectrum of the direct sum and quadrature sum waveform indicating the magnitude of velocity and the sign of the slope of the spectrum of the quadrature sum waveform determining the direction of the velocity. [A4153]

"Weather radar transistorized pulse modulator"

A transistorized active switch radar pulse modulator has a unique means for pulse current control which includes a transformer interconnected with a magnetron. Transistor switches and related circuitry pulse a step up transformer with voltage pulses to drive the magnetron with a desired current pulse having the appropriate shape and width. A capacitor in the secondary of the transformer acts as a load to the transformer prior to the conduction level of the magnetron so that no current transients occur after the magnetron fires. Suitable protective features operate to sense an arcing condition and to dissipate the arcing effects. A unique slope control circuit insures that the requisite flat current pulse drives the magnetron. [A4154]

"Hydraulic brake system with automatic brake means for vehicles"

A hydraulic brake system for an automobile comprises an automatic brake valve disposed in a fluid passage between a pump and a reservoir. The automatic brake valve is actuated by an obstacle-sensing computer to increase the fluid pressure in the fluid passage irrespective of foot brake pedal depression. Therefore, the brake may be applied even when the automobile driver should be unaware of an obstacle on the road. [A4155]

"Adaptive clutter velocity cancellation system for pulsed digital MTI system"

A digital MTI radar system for improved handling of "moving clutter" which employs a double phase detector scheme to provide both Doppler sine and Doppler cosine terms which are separately digitally encoded in a series of range increments throughout each pulse repetition interval. The discrete digitally encoded values thus represent instantaneous echo signal phase angle in each corresponding range increment. This angle data is compared by range increments with that of the last previous pulse repetition period, to provide net signal phase angle change in digital form (a velocity related term) by range increments successively. The remaining circuitry comprises a device for sampling this net phase angle change over a predetermined number of range increments to compute average clutter velocity with respect to the radar system location. A bona fide signal in the moving clutter may then be recognized on the basis of its exceeding the average clutter velocity. A quantized output is effected by means of a logic arrangement which detects the condition of signal presence in one or two adjacent ones of the range increments provided these increments are preceded and followed by a predetermined relatively small number of range increments exhibiting no signal above the said average clutter velocity. [A4156]

"High capacity recirculating delay loop integrator"

A system for integrating recurring pulses. A pulse compression system. A delay network for recirculating the input pulses. The system output is a pulse which substantially equals the sum of input pulses. [A4157]

"Marine traffic conflict assessment system"

The invention is a radar harbor surveillance sensor, computer, and display system for providing a graphic display of vessels negotiating confined navigation channels and permitting rapid and accurate assessment of the degree of hazard or safety in the movements of the monitored vessels. [A4158]

"Radar MTI processor with CFAR"

Disclosed is a radar signal processor providing Moving Target Indicator (MTI) operation with Constant False Alarm Ratio (CFAR) capability. The processor affords substantially reduced incidence of false alarms due to large clutter scatterer returns which exceed normal detection thresholds even after suppression by conventional MTI processing, and at the same time it affords largely unimpaired subclutter visibility. These capabilities are achieved by paralleling the MTI channel with a second processor channel which provides CFAR operation by imposing an additional detection threshold effective to blank the response of the MTI channel to very large clutter scatterers. [A4159]

"Large area motion sensor"

An intrusion detector operating with electromagnetic sensors to detect intruder motion within large, defined areas is disclosed. The system provides an acceptably low false alarm rate by means of range discrimination whereby moving objects outside the protected area do not affect the system and by improving sensitivity to slow-moving targets even when located very close to the sensor location. The system incorporates a transmitter which is frequency modulated by a triangular or sawtooth wave and a receiver which produces an output signal that varies in accordance with the instantaneous difference between the transmitted and received frequencies. The frequency of this difference signal is the beat frequency, and is proportional to the range of the target. Storage means are provided to permit comparison of successively received signals over a predetermined period of time, and this comparison serves to reveal slowly varying changes in the return signal pattern. Alarm means are provided which respond to significant variations in successive measurements, and when a threshold level of difference is exceeded for a certain number of consecutive sweeps, an alarm is sounded. [A4160]

"Underground pipe detector"

An apparatus and method wherein an electrical impulse source transmits a radar-type signal through an antenna into the ground and is reflected by a target. The reflected signal or echo is detected by the antenna and an analog-to-digital converter converts it to a digital form which may be readily operated on, stored and recalled. A memory stores the information until recalled for comparison with a subsequent signal. A processing means compares the stored and subsequent signal to give an indication of the location of metallic and non-metallic buried targets. [A4161]

"Switchable beamwidth monopulse method and system"

In a switchable beamwidth monopulse method and system, an antenna comprising a curved reflector and a first set of monopulse feeds positioned in the effective region of the Airy disc of the antenna includes a second set of monopulse feeds. The second set of monopulse feeds is positioned outside the Airy disc in the region of first bright Airy ring. In narrow beamwidth monopulse operation, monopulse sum and difference channel patterns are obtained from the first set of feeds within the Airy disc. In wide beamwidth monopulse operation, the difference channel pattern is obtained from the second set of feeds in the Airy ring, the sum channel pattern is obtained by attenuation and phase shifting the sum channel signal obtained from the first set of feeds, and adding the resultant to the sum channel signal obtained from the second set of feeds. In a simplified form of the invention, the difference channel patterns for both narrow and wide beamwidth mode operation are obtained from the second set of feeds, while the sum channel patterns are obtained as described above. [A4162]

"Moving target indicator clutter tracker"

An improved MTI (Moving Target Indicator) cancelling system that provides cancellation in the first canceller stage of clutter at a first frequency and cancellation in a second or subsequent canceller stage of clutter such as weather or chaff with a substantial doppler frequency offset from that cancelled in the first MTI canceller. The first canceller stage may be a conventional in-phase (I) and in-quadrature (Q) digital MTI unit to develop the I and Q first differences followed by a conversion of these differences into a combined first difference designated as a quantity M and representing an angle times an amplitude multiplier. This M signal is then applied to a second canceller to develop a second difference signal which is then normalized to represent a pure angle term. A computer then determines the average angular error percentage over a selected number of adjacent range bins at each range bin interval and this percent error is then multiplied by the time aligned value of M to provide an actual error and a modified value of M is developed by subtracting the actual error from the value of M. The modified first difference signal is then subtracted from the delayed first difference signal to generate a second difference output signal with the undesired clutter at different doppler frequencies being cancelled. [A4163]

"Proximity indication with means for computing the distance from an own station to an interrogating secondary surveillance radar"

A method and apparatus for determining the distance to a secondary surveillance radar (SSR) station from an own transponder station when another transponder station lies within a monitored region surrounding the own station. The distance information is utilized to modify the operating mode of a proximity indicating system at the own station. [A4164]

"Marine radar transmission and reception system"

A marine radar transmission and reception system in which first and second transmission pulse radar waves are emitted as first and second pulse radar waves from first and second radar antennae or a common radar antenna, reflected waves of the first and second emitted pulse radar waves are received as first and second received pulse radar waves by the first and second radar antennae or the common radar antenna, the modes of the first and second transmission pulse radar waves are selected in cooperation with those of the first and second radar antennae or that of the common radar antenna so that the first and second received pulse radar waves may be received by the first and second radar antennae or the common radar antenna independently of each other, a quotient or difference output corresponding to the quotient or difference of the first and second received pulse radar waves or the first and second received outputs based thereon is obtained, and sea clutter eliminated received pulse radar waves or outputs based thereon that signal components of the period--in which the quotient or difference output exceeds one predetermined threshold value or lies between two threshold values--are eliminated or suppressed, are obtained. [A4165]

"Fixed beam radar with dual range light display providing both range and azimuth information"

A radar principally for use on small vehicles such as sailboats, utilizing a fixed antenna which provides a continuous forward looking beam and has a dual range display providing range and limited azimuth information. Separate antenna elements are utilized to receive echoes in the paths of left and right radar beams respectively, these left and right beams being slightly to the left and right of the boresight of the radar antenna. Utilizing digital techniques, the video representing radar echoes received in the left and right beams is gated in proper time sequence corresponding to target range, to a series of indicator lights for left and right range display respectively. These indicator lights each represent a different target range and are excited in accordance with video signals received in the left and right beams respectively. The indicator lights vary in their intensity so as to indicate whether targets are to the left or right of the antenna boresight and thus to the left or right of the heading of the vehicle. The indicator lights thus indicate both the range and relative azimuth of targets ahead of the boat. [A4166]

"Marine radar transmission and reception system"

A marine radar transmission and reception system in which first and second transmission pulse radar waves are emitted as first and second pulse radar waves from first and second radar antennae or a common radar antenna, reflected waves of the first and second emitted pulse radar waves are received as first and second received pulse radar waves by the first and second radar antennae or the common radar antenna, the modes of the first and second transmission pulse radar waves are selected in cooperation with those of the first and second radar antennae or that of the common radar antenna so that the first and second received pulse radar waves may be received by the first and second radar antennae or the common radar antenna independently of each other, a quotient or difference output corresponding to the quotient or difference of the first and second received pulse radar waves or the first and second received outputs based thereon is obtained, and sea clutter eliminated received pulse radar waves or outputs based thereon that signal components of the period--in which the quotient or difference output exceeds one predetermined threshold value or lies between two threshold values--are eliminated or suppressed, are obtained. [A4167]

"Tracking system utilizing Kalman filter concepts"

A monopulse radar tracking system is disclosed employing four tracking channels, one for each of range, velocity, azimuth and elevation. The two angle channels are referenced directly to antenna coordinates. Each channel is mechanized by a stored program in a digital computer, and the mechanization employs Kalman filtering with gain factors continually optimized for measured signal-to-noise ratios. Angular rate commands for the antennas are obtained by passing pointing error estimates from the angle channels through a compensator for antenna motion and adding line-of-sight rate estimates from the angle filter channels. Cross-coupling between channels is provided, and each channel is aided by outputs from an inertial navigation platform. Preaveraging of discriminants received between computational cycles is provided. [A4168]

"Doppler radar for forecasting collision"

A Doppler radar for forecasting collision, in which three consecutive Doppler signals are obtained by radiating microwave forwardly from the front of a car, the frequency of the microwave being consecutively switched in three steps at a constant interval, and combining the aforesaid microwave and reflected microwave reflected from an object for obtaining intelligence about the distance of the object from the car front, residual time left for the object to reach the car front as well as forecasting collision or non-collision from two of the three Doppler signals and obtaining intelligence about the sense of relative velocity of the object relative to the car front from the remaining Doppler signal and one of the aforesaid two Doppler signals. [A4169]

"Synchronous detector with pulse repetition frequency modulation"

A moving target indicating radar that includes a coherent on receive system and a clutter referenced velocity compensator operating in association with a linear predictor to produce coherent IF (intermediate frequency) receive signals shifted in frequency to compensate for the radar platform's motion. A synchronous detector, with pulse repetition frequency modulation, translates the coherent IF received signals to video signals at a desired frequency offset. A storage processor processes and range gates the video signals prior to doppler filtering and displaying the signals as a representation of moving targets. [A4170]

"Digital adaptive speed control for vehicles"

A sensor, such as a radar, is mounted on a moving vehicle equipped with a speed control system which normally maintains the vehicle speed constant at a pre-set speed in the absence of a preceding vehicle within a safe distance. The sensor detects the presence of a preceding vehicle and measures the distance and closing speed of the controlled vehicle with respect to the preceding vehicle, and generates an adaptive speed signal. The adaptive speed signal modifies the error signal of the speed control system which controls either the throttle or brake to cause the controlled vehicle to match its speed to the speed of the preceding vehicle, and to maintain a safe distance from it, thereby making the adaptive speed signal vanish. The error signal may be modified by the adaptive speed signal either by decreasing the desired speed or by increasing the actual speed. The desired, actual, and adaptive speeds may all be represented by digital numbers. [A4171]

"Temperature compensated acoustic surface wave device"

A temperature compensated acoustic surface wave device, such as a surface wave delay line is provided in which temperature compensation is provided by the deposition of an interdigital electrode structure on a substrate with an overlay film surface of piezoelectric material of a predetermined thickness. A double substrate arrangement is also disclosed in which the interdigital electrode structure is deposited upon the surface of a non-piezo-electric layer which in turn is placed upon the surface of a piezoelectric substrate. [A4172]

"Fixed beam radar with range light display"

A radar principally for use on small vehicles such as sail boats, utilizing a fixed antenna which provides a continuously forward looking beam and which provides a range display only. Utilizing digital techniques, the video representing radar echoes is gated in proper time sequence corresponding to target range to a series of indicator lights. These indicator lights each represent a different target range, and thus provide a display indicating the range at which various targets forward of the vehicle are located. [A4173]

"System for and method of analyzing electromagnetic waves"

A high-frequency wave, e.g. from a target reflecting transmitted radar signals, arrives with different phasing at a plurality of spaced-apart receivers or at a single receiver movable with reference to the signal source. The wave components thus received are fed directly to an array of electromechanical input transducers on the entrance side of a piezoelectric crystal, or are transmitted to respective storage elements which temporarily register information of their phasing to modulate a local oscillation delivered to these input transducers, whereby micro-acoustic vibrations are generated in the crystal with a phase relationship corresponding to that of the original wave components. The acoustic waves in the crystal converge, possibly with the aid of an internal or external focusing surface, on the exit side of the crystal to excite one of a multiplicity of mechanoelectrical output transducers producing a signal indicative of that phase relationship. The system can be used to measure angle of incidence, relative radial velocity, source distance, or the harmonics content of the wave to be analyzed. [A4174]

"Combined contiguous filter and acceleration and velocity analyzer for radar"

A single filter to replace a set of parallel filters in an O-T-H radar coising a prelimiting filter connected to amplifying and limiting means and quenching means for shorting out said prelimiting filter at appropriate times. The prelimiting filter is connected to receive the output of the mixer of one range bin of the velocity-and-acceleration analyzer of the radar and the predetection filter of the analyzer receives the output of the amplifying and limiting means. The quenching means also receives the output of the amplifying and limiting means and provides a quenching signal to the predetection filter. [A4175]

"Method and apparatus for digitally measuring speed"

A digital display doppler radar unit has a moving mode and a stationary mode. The incoming doppler signal, which in the moving mode, represents both speed of the radar platform and speed of an approaching target vehicle, is separated into two signal components by selective filtering. One component represents the sum of the ground speeds for the radar platform and approaching vehicles. A time base is generated by a crystal control means and the time base is utilized for correlating the received doppler signals, indicative of speed, with the time base. Each doppler signal component is converted to binary coded decimal (BCD) information and a digital counter counts the cycles of each reeived doppler signal and compares the count with an amount previously stored. Circuit means are provided to validate the received doppler signal, allowing their continual processing only after a preselected number of valid comparisons are made. The radar signal component representing the ground speed sum for the radar platform and the approaching target vehicle, and the component representing radar platform speed are combined. The radar platform speed is subtracted from the combined component, resulting in a digital count representing approaching target vehicle speed. In the stationary mode, there is no radar platform doppler pulses in the radar return and consequently, the returning pulses may be processed directly and no subtracting function is performed. Speeds corresponding to the valid received doppler signals are suitably displayed to indicate a speeding violation. [A4176]

"Plural channel filter"

A signal processing arrangement which discriminates against large-amplitude nterference signals and in favor of information signals. Incoming signals are separated into a plurality of contiguous frequency channels whose total frequency coverage is the frequency band of interest. The signals in the individual channels are then amplitude limited so that relatively narrow band interference signals are limited while a wide band desired signal is not. The desired signal is then spectrally compressed to obtain a high amplitude signal while the remaining interference signals are spread and rejected. [A4177]

"System for resolving velocity ambiguity in pulse-doppler radar"

A pulse-doppler radar tracking system is disclosed employing four filter channels for tracking range, velocity, azimuth and elevation. Each channel is mechanized in a Kalman filter form by a stored program in a digital computer. The range channel estimates target range, R.sub.TPR, range rate, V.sub.TPV and acceleration a.sub.TPV from one of many received signal frequency spectra at multiples of the pulse repetition frequency (PRF) . Once error in the range rate estimate, V.sub.TPR, is within a velocity corresponding to .lambda. PRF/4, the velocity channel is reinitialized in its estimate of target velocity, V.sub.TPV, with a corrected velocity computed from the less accurate but unambiguous estimate of velocity, V.sub.TPR, and the ambiguous estimate of velocity, V.sub.TPV. [A4178]

"Closed loop tunnel diode receiver for operation with a base band semiconductor transmitter"

A vehicle safety apparatus includes a base band pulse transmitter-receiver system for the detection of an impending collision immediately prior to the contact of the vehicle with another object for the actuation of restraining or other safety devices to protect the occupants of the vehicle when the crash event actually occurs. A semiconductor base band transmitter and receiver system is synchronously operated by a master clock, providing precise operation of the receiver gain control, sensitivity time control, and other receiver functions, in a low-cost, rugged, long-lived object detection system. [A4179]

"Temperature compensated acoustic surface wave device"

A temperature compensated acoustic surface wave device, such as a surface wave delay line is provided in which temperature compensation is provided by the deposition of an interdigital electrode structure on a substrate with an overlay film surface of piezoelectric material of a predetermined thickness. A double substrate arrangement is also disclosed in which the interdigital electrode structure is deposited upon the surface of a non-piezoelectric layer which in turn is placed upon the surface of a piezoelectric substrate. [A4180]

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A29. Пат. 10144418 США, МПК B60W30/09, G01S13/93, B60T7/22. Control apparatus for vehicle / Y. Matsunaga, Y. Hoshikawa. - № 15/133860; Заявлено 20.04.2016; Опубл. 04.12.2018. - 17 с.↑

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A32. Пат. 10140868 США, МПК G08G1/16, G01S5/00, B60K31/00, G01S13/93. V2V messaging based on road topology / O. Lei, A. R. Murray. - № 15/685581; Заявлено 24.08.2017; Опубл. 27.11.2018. - 10 с.↑

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A34. Пат. 10139486 США, МПК G01S13/95, G01W1/00, G01W1/10. System for predicting path of convective cell and control method thereof / J. Y. Kim, J. S. Ko, H. J. Yang, T. S. Kwon, S. J. Oh и др. - № 14/848112; Заявлено 08.09.2015; Опубл. 27.11.2018. - 19 с.↑

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A40. Пат. 10135131 США, МПК H01Q1/42, G01S13/93, H01Q1/44, G01S7/02. Electromagnetic-wave transmitting cover / K. Takao, D. Kawashima, T. Sekiya, H. Maeda, K. Okumura и др. - № 14/959018; Заявлено 04.12.2015; Опубл. 20.11.2018. - 16 с.↑

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A42. Пат. 10134294 США, МПК G06F19/00, G01S13/87, G08G5/04, G08G5/00, G01S19/48 и др. System, apparatus, and method using ADS-B and TCAS data for determining navigation solutions for a vehicle / G. Feng, G. I. Kim. - № 15/246307; Заявлено 24.08.2016; Опубл. 20.11.2018. - 26 с.↑

A43. Пат. 10132922 США, МПК G01S13/36, G01S13/32, G01S7/35. Proximity sensor and method for measuring the distance from an object / S. Fericean, M. Eberspaecher. - № 14/895012; Заявлено 01.07.2013; Опубл. 20.11.2018. - 21 с.↑

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A237. Пат. 9945935 США, МПК G01S13/93, G01S7/35. Digital frequency modulated continuous wave radar using handcrafted constant envelope modulation / A. Eshraghi, C. Davis, M. Ali, P. Dent. - № 15/492159; Заявлено 20.04.2017; Опубл. 17.04.2018. - 55 с.↑

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A3794. Пат. 4604623 США, МПК G01S13/75, G01S13/00, G01S13/34, G01S013/74. Surface acoustic wave passive transponder having non-reflective transducers and pads / H. Skeie. - № 06/509524; Заявлено 30.06.1983; Опубл. 05.08.1986. - 10 с.↑

A3795. Пат. 4604622 США, МПК F42C13/04, F42C13/00, G01S13/28, G01S13/00, G01S13/18 и др. Proximity radar / P. C. G. Delon, G. D. Fourreaux, M. J. R. Nicolas, B. R. Sebilet. - № 06/498162; Заявлено 25.05.1983; Опубл. 05.08.1986. - 6 с.↑

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A3798. Пат. 4600925 США, МПК G01S13/95, G01S13/00, G01S013/95. Vector phase angle change distribution processor / O. J. Alitz, D. P. Moos. - № 06/481535; Заявлено 01.04.1983; Опубл. 15.07.1986. - 21 с.↑

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A3801. Пат. 4597183 США, МПК G01B7/02, G01S13/88, G01S13/00, G01B007/26, G01B007/04. Methods and apparatus for measuring a length of cable suspending a well logging tool in a borehole / R. A. Broding. - № 06/469592; Заявлено 24.02.1983; Опубл. 01.07.1986. - 15 с.↑

A3802. Пат. 4595915 США, МПК G01S13/00, G01S13/56, G08B13/24, G08B013/14. Electronic surveillance system employing the doppler effect / L. R. Close. - № 06/577583; Заявлено 06.02.1984; Опубл. 17.06.1986. - 23 с.↑

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A3804. Пат. 4590569 США, МПК G01C21/20, G01S13/86, G01C21/22, G01S13/00, G01S7/04 и др. Navigation system including an integrated electronic chart display / M. Rogoff, P. M. Winkler, J. N. Ackley. - № 06/542165; Заявлено 14.10.1983; Опубл. 20.05.1986. - 16 с.↑

A3805. Пат. 4590476 США, МПК G01S13/00, G01S13/68, G01S013/66. Tracking servo compensator with rate aiding / B. E. Burkett. - № 06/640902; Заявлено 15.08.1984; Опубл. 20.05.1986. - 12 с.↑

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A3807. Пат. 4578677 США, МПК G01S13/28, G01S13/00, G01S013/28. Range doppler coupling magnifier / B. L. Lewis. - № 06/535085; Заявлено 23.09.1983; Опубл. 25.03.1986. - 9 с.↑

A3808. Пат. 4566760 США, МПК G01S13/28, G02F1/01, G01S13/00, G02F1/11, G06E3/00 и др. Multi-product acousto-optic time integrating correlator / I. J. Abramovitz, N. J. Berg, M. W. Casseday. - № 06/599365; Заявлено 12.04.1984; Опубл. 28.01.1986. - 17 с.↑

A3809. Пат. 4556887 США, МПК G01S13/536, G01S13/00, G01S013/58, G01S013/00. Radar systems / G. M. Exeter. - № 06/398216; Заявлено 14.07.1982; Опубл. 03.12.1985. - 7 с.↑

A3810. Пат. 4555704 США, МПК G01S13/70, G01S13/00, G01S13/78, G01S013/00. Range reply search apparatus / J. E. Treise. - № 06/441454; Заявлено 15.11.1982; Опубл. 26.11.1985. - 9 с.↑

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A3815. Пат. 4549181 США, МПК G01S13/62, G01S13/93, G01S13/00, G01S13/58, G08G001/00 и др. Moving obstacle detection system for a vehicle / A. Tachibana, M. Kiyoto. - № 06/428225; Заявлено 29.09.1982; Опубл. 22.10.1985. - 12 с.↑

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A3817. Пат. 4542382 США, МПК G01S13/538, G01S13/00, G01S13/524, G01S013/54. Search radar apparatus / W. A. Hol. - № 06/392115; Заявлено 25.06.1982; Опубл. 17.09.1985. - 28 с.↑

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A3864. Пат. 4377811 США, МПК G01S13/00, G01S13/53, G01S013/04. Medium PRF pulse doppler radar having simplified ground moving target rejection capabilities / D. H. Mooney, J.K. A. Harriger. - № 06/223177; Заявлено 07.01.1981; Опубл. 22.03.1983. - 10 с.↑

A3865. Пат. 4373161 США, МПК B60Q1/54, B60Q1/50, G01S13/00, G01S13/60, H01Q1/32 и др. Doppler radar mounting structure for motor vehicles / A. Matsumura. - № 06/179982; Заявлено 21.08.1980; Опубл. 08.02.1983. - 8 с.↑

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A3867. Пат. 4364049 США, МПК G01S13/76, G01S13/00, G01S013/87. Radar transponders / A. R. Moore, J. Waterworth. - № 06/151531; Заявлено 19.05.1980; Опубл. 14.12.1982. - 7 с.↑

A3868. Пат. 4359734 США, МПК G01S13/58, G01S13/00, G01S007/34, G01S013/58. Signal processing system / W. J. Bachman. - № 06/008057; Заявлено 31.01.1979; Опубл. 16.11.1982. - 9 с.↑

A3869. Пат. 4358759 США, МПК G01S13/00, G01S13/56, G08B013/22, G01S009/02. Microwave movement detector / J. A. C. Stewart, B. M. Armstrong, H. S. Gamble, J. Mallon, F. C. Monds и др. - № 06/158141; Заявлено 10.06.1980; Опубл. 09.11.1982. - 6 с.↑

A3870. Пат. 4357608 США, МПК G01S13/00, G01S13/87, G01S13/42, G15, G15 и др. Scanning radar system / B. L. Lewis. - № 06/183697; Заявлено 03.09.1980; Опубл. 02.11.1982. - 5 с.↑

A3871. Пат. 4356489 США, МПК G01S13/00, G01S13/60, G01S013/93. Vehicle speed sensing apparatus with electromagnetic wave interference detector / Y. Hirota, A. Endo, K. Sekine. - № 06/142816; Заявлено 22.04.1980; Опубл. 26.10.1982. - 11 с.↑

A3872. Пат. 4356487 США, МПК G01S13/95, G01S13/00, G01S7/02, G01S7/41, G01S013/95. Sounding apparatus / L. Herbreteau. - № 06/164543; Заявлено 02.07.1980; Опубл. 26.10.1982. - 8 с.↑

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A3874. Пат. 4353068 США, МПК B61L13/00, B61L13/02, G01P21/02, G01S13/00, G01P21/00 и др. Method for calibrating beam emitter type speed sensor for railroad rolling stock / E. A. Fernandez. - № 06/152586; Заявлено 23.05.1980; Опубл. 05.10.1982. - 8 с.↑

A3875. Пат. 4349823 США, МПК G01S13/93, G01S13/00, G01S7/04, G01S013/00, G08B023/00 и др. Automotive radar monitor system / K. Tagami, T. Senzaki, N. Suzuki, E. Murao. - № 06/171165; Заявлено 22.07.1980; Опубл. 14.09.1982. - 10 с.↑

A3876. Пат. 4348693 США, МПК G01S13/95, G01S13/00, G01S7/00, H04N005/02. Television weather radar system / J. D. Cauldwell. - № 06/145631; Заявлено 01.05.1980; Опубл. 07.09.1982. - 16 с.↑

A3877. Пат. 4348675 США, МПК G01S13/93, G01S13/00, G01S13/34, G01S013/32. FM-CW Radar system for use in an automotive vehicle / T. Senzaki, E. Murao. - № 06/171149; Заявлено 22.07.1980; Опубл. 07.09.1982. - 13 с.↑

A3878. Пат. 4348674 США, МПК G01S13/00, G01S7/02, G01S13/524, G01S7/41, G01S13/53 и др. Apparatus and method for classifying moving targets / K. Muth, P. Federspieler. - № 06/165296; Заявлено 02.07.1980; Опубл. 07.09.1982. - 5 с.↑

A3879. Пат. 4346774 США, МПК B60R16/02, G01S13/00, G01S13/60, H01Q1/32, B60T008/10. Doppler radar mounting structure for motor vehicles / Y. Hirota, A. Endo, K. Kimura, H. Morozumi, K. Sekine. - № 06/078825; Заявлено 25.09.1979; Опубл. 31.08.1982. - 11 с.↑

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A3883. Пат. 4339753 США, МПК G01S13/58, G01S13/00, G01S13/82, G01S013/78, G01S013/58. Vehicle identification system / D. D. Mawhinney. - № 06/105124; Заявлено 19.12.1979; Опубл. 13.07.1982. - 8 с.↑

A3884. Пат. 4335383 США, МПК G01S13/00, G01S13/60, G01S13/524, G01S013/58. Method and apparatus for digitally determining the speed of a target vehicle while the radar platform vehicle is in motion / F. M. Berry. - № 06/204587; Заявлено 06.11.1980; Опубл. 15.06.1982. - 17 с.↑

A3885. Пат. 4335382 США, МПК G01S13/92, G01S13/00, G01S013/60, G01S007/40. Traffic radar system / B. K. Brown, S. Correll, J. Schreiber, L. E. Mayfield, D. D. Jenkins. - № 06/128510; Заявлено 10.03.1980; Опубл. 15.06.1982. - 10 с.↑

A3886. Пат. 4333077 США, МПК G01S13/86, G01S13/00, G01S13/87, G01S7/36, G01S013/86. Device for distance acquisition in a radar system / M. Teilhet. - № 06/158793; Заявлено 12.06.1980; Опубл. 01.06.1982. - 5 с.↑

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A3890. Пат. 4320398 США, МПК G01S13/58, G01S13/00, G01S013/58. Minimizing harmonic distortion apparatus / J. D. Fritzlen. - № 06/159044; Заявлено 13.06.1980; Опубл. 16.03.1982. - 6 с.↑

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A3894. Пат. 4318100 США, МПК G01S13/95, G01S13/522, G01S13/00, G01S013/95. Automatic ground clutter rejection in weather pulse radar system / T. Shimizu, A. Wakabayashi, S. Goto. - № 06/122498; Заявлено 19.02.1980; Опубл. 02.03.1982. - 8 с.↑

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A3905. Пат. 4301452 США, МПК G01S13/93, G01S13/00, G08G3/00, G08G3/02, G01S013/00 и др. Station watch alarm system / L. F. Anderson. - № 06/023691; Заявлено 26.03.1979; Опубл. 17.11.1981. - 7 с.↑

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A3933. Пат. 4235403 США, МПК B61K7/00, B61K7/12, G01S13/00, B61K007/12. Speed control apparatus and method for railroad car retarders / H. C. Gillen, D. R. Little. - № 06/032046; Заявлено 23.04.1979; Опубл. 25.11.1980. - 8 с.↑

A3934. Пат. 4234882 США, МПК G01S13/32, G01S13/00, G01S013/34. Method and apparatus for measurement of the contents of a bunker or silo / L. R. F. Thompson. - № 06/009248; Заявлено 05.02.1979; Опубл. 18.11.1980. - 9 с.↑

A3935. Пат. 4234881 США, МПК G01S13/00, G01S13/52, G01S013/58. Dynamic digital time interval discriminator and method / J. Stauers. - № 05/946483; Заявлено 28.09.1978; Опубл. 18.11.1980. - 7 с.↑

A3936. Пат. 4232315 США, МПК G01S13/50, G01S13/18, G01S13/00, G01S013/64, G01S013/70 и др. Range detector / N. C. Kern. - № 04/594316; Заявлено 08.11.1966; Опубл. 04.11.1980. - 4 с.↑

A3937. Пат. 4231039 США, МПК G01S13/00, G01S13/60, G01S009/44. Radar speedometer / J. D. Fritzlen, J. L. Witler. - № 05/973942; Заявлено 28.12.1978; Опубл. 28.10.1980. - 12 с.↑

A3938. Пат. 4231037 США, МПК G01S13/00, G01S7/02, G01S13/87, G01S7/292, G01S013/00. Radar clutter suppressor / M. W. Long. - № 05/880624; Заявлено 23.02.1978; Опубл. 28.10.1980. - 20 с.↑

A3939. Пат. 4229737 США, МПК G01S13/00, G01S13/87, G01S013/87. Ranging system and method for determining the range of a vehicle from a plurality of reference points / C. A. Heldwein, R. N. Jekel, S. R. Sampson, J. T. Zupan. - № 05/875421; Заявлено 06.02.1978; Опубл. 21.10.1980. - 18 с.↑

A3940. Пат. 4225864 США, МПК G01S13/00, G01S13/524, G01S13/53, G01S7/292, G01S009/42. Radar signal processors / J. Lillington. - № 06/022336; Заявлено 20.03.1979; Опубл. 30.09.1980. - 6 с.↑

A3941. Пат. 4223309 США, МПК G01S13/95, G01S7/292, G01S13/00, G01S007/30, G01S009/60. Turbulence detector for non-coherent pulse radar / D. V. Payne. - № 05/945729; Заявлено 25.09.1978; Опубл. 16.09.1980. - 14 с.↑

A3942. Пат. 4223233 США, МПК G01S13/58, G01S13/00, H01L29/768, G11C19/00, H01L29/66 и др. Charge transfer device input circuitry / A. M. Cappon, J. P. Sage. - № 05/800829; Заявлено 26.05.1977; Опубл. 16.09.1980. - 18 с.↑

A3943. Пат. 4222050 США, МПК G01S13/532, G01S13/00, G01S7/292, G01S009/42. Moving target indication radar / E. Kiuchi, T. Irabu. - № 05/961169; Заявлено 16.11.1978; Опубл. 09.09.1980. - 18 с.↑

A3944. Пат. 4219878 США, МПК G01S13/92, G01P3/64, G01P3/42, G01P3/54, G01P3/66 и др. Speed measuring device / W. D. Goodson, J. R. Alden, D. L. Hyder. - № 05/896373; Заявлено 14.04.1978; Опубл. 26.08.1980. - 11 с.↑

A3945. Пат. 4219813 США, МПК G01S13/00, G01S13/64, G01S009/42. Signal processor / J. D. Collins. - № 05/800993; Заявлено 26.05.1977; Опубл. 26.08.1980. - 18 с.↑

A3946. Пат. 4217583 США, МПК G01S13/00, G01S13/52, G01S009/42. Moving target indicator (MTI) radar systems / E. R. Hiller, P. D. Kaplan, J. M. Nicosia, J.H. D. Zuerndorfer. - № 05/582965; Заявлено 30.05.1975; Опубл. 12.08.1980. - 14 с.↑

A3947. Пат. 4217582 США, МПК G01S13/58, G01S13/62, G01S13/93, G01S13/00, G01S13/10 и др. Radar system for detecting approaching vehicles from behind / H. Endo, M. Adachi. - № 05/935908; Заявлено 23.08.1978; Опубл. 12.08.1980. - 9 с.↑

A3948. Пат. 4217563 США, МПК G01S13/00, G01S13/44, G06G7/00, G06G7/195, H03H009/30 и др. Surface wave phase correlator and monopulse radar system employing the same / C. R. Vale. - № 05/642802; Заявлено 22.12.1975; Опубл. 12.08.1980. - 9 с.↑

A3949. Пат. 4216473 США, МПК G01S13/00, G01S13/60, G01S009/44. MIPS Hover attachment / L. I.

Goldfischer, G. Stavis, A. Shrekenhamer. - № 05/961315; Заявлено 16.11.1978; Опубл. 05.08.1980. - 11 с.↑

A3950. Пат. 4214243 США, МПК G01S13/92, G01S13/00, G01S009/44. Harmonic detector for traffic radar / R. E. Patterson. - № 05/943199; Заявлено 18.09.1978; Опубл. 22.07.1980. - 8 с.↑

A3951. Пат. 4214240 США, МПК F42C13/04, F42C13/00, G01S13/00, G01S13/30, F42C013/04. Coded pulse radar fuze / F. Weiss. - № 04/416684; Заявлено 03.12.1964; Опубл. 22.07.1980. - 8 с.↑

A3952. Пат. 4213123 США, МПК G01S13/00, G01S13/56, G08B13/24, G08B013/18. Integral enable-disable means for guided wave radar intrusion detector system portals / J. L. Poirier. - № 06/010093; Заявлено 07.02.1979; Опубл. 15.07.1980. - 6 с.↑

A3953. Пат. 4213093 США, МПК G01V3/15, G01V3/12, G01S13/88, G01S13/00, G01V003/08. Portable buried object detection system with error reducing signal processing / P. M. Pecori. - № 05/923511; Заявлено 10.07.1978; Опубл. 15.07.1980. - 8 с.↑

A3954. Пат. 4210900 США, МПК G01S13/00, G01S13/75, G06K19/067, G06K7/10, H04Q003/00. Surface acoustic wave code reader / G. Shavit. - № 05/934155; Заявлено 16.08.1978; Опубл. 01.07.1980. - 15 с.↑

A3955. Пат. 4208658 США, МПК B60Q1/50, B60Q1/52, G01S13/93, G01S13/00, G01S7/04 и др. Radar-operated vehicle safety assurance system / N. Fujiki, K. Baba, A. Mimura. - № 05/954853; Заявлено 26.10.1978; Опубл. 17.06.1980. - 15 с.↑

A3956. Пат. 4207569 США, МПК B61L23/00, B61L23/06, G01S13/76, G01S13/00, G01S009/56. Railroad radio frequency waveguide / J. R. Meyer. - № 05/933508; Заявлено 14.08.1978; Опубл. 10.06.1980. - 11 с.↑

A3957. Пат. 4206463 США, МПК G01S13/00, G01S7/285, G01S7/34, G01S13/24, G01S13/30 и др. Radar systems / J. A. Glasgow. - № 05/926733; Заявлено 21.07.1978; Опубл. 03.06.1980. - 6 с.↑

A3958. Пат. 4205314 США, МПК G01S13/58, G01S13/00, G01S009/44, G01S009/02, G01S009/23. Device for measuring the range of a moving target and the speed at which it approaches or recedes / R. Strauch. - № 05/862005; Заявлено 19.12.1977; Опубл. 27.05.1980. - 5 с.↑

A3959. Пат. 4203111 США, МПК G01S13/00, G01S13/524, G01S009/42. Radar device including a circuit arrangement for reducing interference / W. Buehring. - № 05/924162; Заявлено 13.07.1978; Опубл. 13.05.1980. - 5 с.↑

A3960. Пат. 4200871 США, МПК G01S13/58, G01S13/00, G01S13/34, G01S009/02. Acquisition system for continuous-wave frequency modulation object detector / R. S. Roeder, L. C. Bomar, I.I. - № 05/906291; Заявлено 15.05.1978; Опубл. 29.04.1980. - 17 с.↑

A3961. Пат. 4198632 США, МПК G01S13/76, G01S13/00, G01S009/56. Transponder reply limiting by means of recognition of fixed interrogation periods / W. B. Bishop. - № 03/151973; Заявлено 10.06.1971; Опубл. 15.04.1980. - 14 с.↑

A3962. Пат. 4193074 США, МПК G01S13/00, G01S13/44, G01S009/22. Enhancing radar returns from targets having a small radar cross section / E. C. Schwartz, T. F. Leney. - № 05/530566; Заявлено 03.12.1974; Опубл. 11.03.1980. - 5 с.↑

A3963. Пат. 4192002 США, МПК G01S13/00, G01S13/91, G06F015/50. Apparatus and methods for position determining and plotting / G. L. Draper. - № 05/875009; Заявлено 03.02.1978; Опубл. 04.03.1980. - 28 с.↑

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A3965. Пат. 4189732 США, МПК G01S13/00, G01S13/06, G01S009/00. Motor actuating circuitry / J. B. Atwater. - № 05/782746; Заявлено 30.03.1977; Опубл. 19.02.1980. - 5 с.↑

A3966. Пат. 4188629 США, МПК G01S13/00, G01S13/75, G01S009/233, G01S009/56. Passive navigation system with frequency coding / R. H. Johnson. - № 05/706659; Заявлено 19.07.1976; Опубл. 12.02.1980. - 5 с.↑

A3967. Пат. 4186397 США, МПК G01S13/32, G01S13/00, G01S009/04. Short range precision navigation and tracking system and method therefor / W. I. Sternberger, L. R. LeBlanc. - № 05/830408; Заявлено 06.09.1977; Опубл. 29.01.1980. - 8 с.↑

A3968. Пат. 4185284 США, МПК G01S13/76, G01S13/00, G01S009/56. Ground station for the DME distance measuring system / H. Vogel, H. Kleiber. - № 05/962961; Заявлено 22.11.1978; Опубл. 22.01.1980. - 6 с.↑

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A3970. Пат. 4184154 США, МПК G01S13/32, G01S13/42, G01S13/00, G01S009/37. Range and angle determining Doppler radar / D. F. Albanese, H. R. Kennedy, J. W. Goodwin. - № 05/698192; Заявлено 21.06.1976; Опубл. 15.01.1980. - 15 с.↑

A3971. Пат. 4180814 США, МПК G01S3/14, G01S13/42, G01S3/46, G01S13/00, H01Q3/26 и др. Multiple beam receiving array signal processor / P. Barton. - № 05/885607; Заявлено 13.03.1978; Опубл. 25.12.1979. - 7 с.↑

A3972. Пат. 4177466 США, МПК G01S13/74, G01S5/04, G01S13/00, G01S011/00. Auto theft detection system / W. R. Reagan. - № 05/851835; Заявлено 16.11.1977; Опубл. 04.12.1979. - 5 с.↑

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A3974. Пат. 4176749 США, МПК B03B5/24, B03B5/20, B03B5/00, G01S15/00, G01S13/00 и др. Materials separation / W. M. Wallace, G. F. Craven. - № 05/868931; Заявлено 12.01.1978; Опубл. 04.12.1979. - 18 с.↑

A3975. Пат. 4176352 США, МПК G01S13/60, G01S13/00, G01S009/50. Apparatus for deriving information concerning the movements of a vehicle / R. A. Tyler. - № 05/645714; Заявлено 31.12.1975; Опубл. 27.11.1979. - 6 с.↑

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A3977. Пат. 4172255 США, МПК G01S13/95, G01S13/58, G01S13/89, G01S13/87, G01S13/02 и др. HF coastal current mapping radar system / D. E. Barrick, M. W. Evans. - № 05/822868; Заявлено 08.08.1977; Опубл. 23.10.1979. - 9 с.↑

A3978. Пат. 4170774 США, МПК G01S3/14, G01S3/22, G01S3/32, G01S3/46, G01S13/00 и др. Amplitude selected phase interferometer angle measuring radar / C. F. Schaefer. - № 05/219775; Заявлено 24.01.1972; Опубл. 09.10.1979. - 8 с.↑

A3979. Пат. 4168499 США, МПК G01S13/93, G01S13/00, B60T007/12, G01S009/02. Anti-collision radar system provided with circuitry for monitoring driver's / A. Matsumura, N. Fujiki. - № 05/920339; Заявлено 29.06.1978; Опубл. 18.09.1979. - 11 с.↑

A3980. Пат. 4167007 США, МПК G01S13/78, G01S13/00, G01S009/56. Method and apparatus for identifying radar targets / I. L. M. McGeoch, W. B. Stawell. - № 05/811428; Заявлено 29.06.1977; Опубл. 04.09.1979. - 11 с. ↑

A3981. Пат. 4165511 США, МПК G01S13/93, G01S13/00, G01S009/02. Reduction of echoes of irrelevant targets in a vehicle anti-collision radar system / B. Wocher, H. Pfitzmaier, T. Pfendler. - № 05/841707; Заявлено 13.10.1977; Опубл. 21.08.1979. - 8 с.↑

A3982. Пат. 4164740 США, МПК G01S13/90, G01S7/04, G01S7/10, G01S13/00, G01S009/02. Synthetic aperture using image scanner / J. N. Constant. - № 05/897907; Заявлено 19.04.1978; Опубл. 14.08.1979. - 12 с. ↑

A3983. Пат. 4164738 США, МПК G01S13/90, G01S7/04, G01S13/00, G01S009/42. Focused synthetic array / P. Swerling. - № 04/560386; Заявлено 23.06.1966; Опубл. 14.08.1979. - 7 с.↑

A3984. Пат. 4163973 США, МПК G01S13/00, G01S13/44, G01S009/22. Means for developing a radar tracking error signal / R. E. Jacobson, J. - № 05/549402; Заявлено 18.02.1975; Опубл. 07.08.1979. - 4 с.↑

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A3986. Пат. 4161715 США, МПК E21B47/08, E21B47/00, E21B47/04, G01S13/88, G01S11/00 и др. Method and apparatus for measuring the interior dimensions of a hollow body / L. A. Harris. - № 05/830210; Заявлено 02.09.1977; Опубл. 17.07.1979. - 8 с.↑

A3987. Пат. 4160251 США, МПК G01S7/02, G01K11/00, G01S13/04, G01S7/41, G01S13/00 и др. Hybrid dual mode radiometric system / R. E. Lazarchik, R. S. Roeder. - № 05/861752; Заявлено 19.12.1977; Опубл. 03.07.1979. - 11 с.↑

A3988. Пат. 4158841 США, МПК G01S13/93, G01S7/40, G01S13/00, G08G1/16, G01S13/72 и др. Method and apparatus for the control of the safety distance of a vehicle relative to preceding vehicles / E. Wuchner, U. Heitmeyer, W. Kostelezky. - № 05/796869; Заявлено 16.05.1977; Опубл. 19.06.1979. - 9 с.↑

A3989. Пат. 4157544 США, МПК G01S13/86, G01S13/00, G01S009/02. Hybrid terminal assist landing / R. L. Nichols. - № 05/844252; Заявлено 21.10.1977; Опубл. 05.06.1979. - 15 с.↑

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A3995. Пат. 4153899 США, МПК G01S13/528, G01S13/00, G01S009/42. MTI radar system and method / J. W. Taylor, J. - № 05/665643; Заявлено 10.03.1976; Опубл. 08.05.1979. - 13 с.↑

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A3999. Пат. 4148029 США, МПК G01S13/68, G01S13/00, G01S007/44. System for estimating acceleration of maneuvering targets / E. C. Quesinberry. - № 05/731872; Заявлено 13.10.1976; Опубл. 03.04.1979. - 33 с.↑

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03.04.1979. - 16 с.↑

A4001. Пат. 4148027 США, МПК G01S13/50, G01S13/00, G01S009/02. Surface roughness measuring apparatus / M. Nowogrodzki. - № 05/890802; Заявлено 27.03.1978; Опубл. 03.04.1979. - 5 с.↑

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A4003. Пат. 4146890 США, МПК G01S13/58, G01S13/00, G01S009/44. Range rate measurement / R. J. Klensch. - № 05/873861; Заявлено 31.01.1978; Опубл. 27.03.1979. - 8 с.↑

A4004. Пат. 4144571 США, МПК G01C5/00, G01C21/00, G01S13/88, G01S13/00, G01C021/12. Vehicle guidance system / W. F. Webber. - № 05/777776; Заявлено 15.03.1977; Опубл. 13.03.1979. - 9 с.↑

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A4006. Пат. 4142187 США, МПК G01S13/00, G01S13/56, G08B13/16, G08B013/24. Dual frequency alarm device using Doppler effect for sensing a moving object / H. Nakayama. - № 05/778732; Заявлено 17.03.1977; Опубл. 27.02.1979. - 11 с.↑

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A4008. Пат. 4137533 США, МПК G01S7/285, G01S7/32, G01S13/524, G01S13/526, G01S13/00 и др. Angle/vector processed, phase-accumulated single vector rotation, variable order adaptive MTI processor / G. T. Briechle, J. A. D. Domizio, F. Weindling. - № 05/841279; Заявлено 12.10.1977; Опубл. 30.01.1979. - 17 с.↑

A4009. Пат. 4137532 США, МПК G01S13/22, G01S13/524, G01S13/00, G01S009/42, G01S007/30. VIP doppler filter bank signal processor for pulse doppler radar / J. W. Taylor, J.R. G. Martin. - № 05/792279; Заявлено 29.04.1977; Опубл. 30.01.1979. - 21 с.↑

A4010. Пат. 4135188 США, МПК G01S13/60, G01S13/00, G01S009/44. Method and apparatus for orally announcing vehicle speed / E. B. Bickley, J.T. H. Harrison, R. K. Haigh. - № 05/829533; Заявлено 31.08.1977; Опубл. 16.01.1979. - 7 с.↑

A4011. Пат. 4135187 США, МПК G01S13/76, G01S13/00, G01S009/56. Transponder decoder/encoder circuitry / M. Borota, J. - № 05/688181; Заявлено 20.05.1976; Опубл. 16.01.1979. - 8 с.↑

A4012. Пат. 4131889 США, МПК G01S13/56, G01S13/00, G01S009/44. Miniature doppler radar systems and microwave receivers suitable therefor / K. W. Gray. - № 05/766789; Заявлено 08.02.1977; Опубл. 26.12.1978. - 7 с.↑

A4013. Пат. 4128834 США, МПК G09B9/40, G09B9/02, G01S13/95, G01S7/22, G01S7/04 и др. Range mark generation / K. Katagi. - № 05/790661; Заявлено 25.04.1977; Опубл. 05.12.1978. - 10 с.↑

A4014. Пат. 4126859 США, МПК G01S13/78, G01S13/91, G01S13/00, G01S009/56. Ground station for a round-trip-path distance-measuring system / M. Bohm. - № 05/846432; Заявлено 28.10.1977; Опубл. 21.11.1978. - 5 с.↑

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A4016. Пат. 4123754 США, МПК G01S13/75, G01S13/00, G07B15/00, G01S009/56. Electronic detection and identification system / F. L. Armstrong. - № 05/700185; Заявлено 28.06.1976; Опубл. 31.10.1978. - 12 с.↑

A4017. Пат. 4118703 США, МПК G01S7/28, G01S13/24, G01S13/00, G01S7/292, G01S007/30. Pulse radar apparatus / P. D. L. Williams. - № 05/796438; Заявлено 12.05.1977; Опубл. 03.10.1978. - 9 с.↑

A4018. Пат. 4114151 США, МПК G01S13/75, G01S13/00, G01S009/56. Passive transponder apparatus for use in an interrogator-responder system / P. R. M. Denne, D. E. N. Davies, C. D. McEwen. - № 05/723621; Заявлено 14.09.1976; Опубл. 12.09.1978. - 9 с.↑

A4019. Пат. 4110754 США, МПК G01S13/93, G01S13/00, G01S13/48, G01S13/34, G01S13/42 и др. Detection of angular displacement to an object from the moving vehicle / H. Endo. - № 05/801315; Заявлено 27.05.1977; Опубл. 29.08.1978. - 18 с.↑

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A4021. Пат. 4107680 США, МПК G01S13/00, G01S13/60, H01Q25/00, G01S009/46, H01Q001/32 и др. Digitally processed radar speed sensor / G. S. Kaplan. - № 05/737777; Заявлено 01.11.1976; Опубл. 15.08.1978. - 9 с.↑

A4022. Пат. 4107676 США, МПК G01S13/00, G01S13/76, G01S009/56, G01S009/04. Trans-horizon navigation system / J. W. Lassiter. - № 05/847766; Заявлено 02.11.1977; Опубл. 15.08.1978. - 12 с.↑

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A4024. Пат. 4106021 США, МПК G01S13/95, G01S7/295, G06F1/03, G06F1/02, G01S007/44 и др. Polar to rectangular coordinate converter / K. Katagi. - № 05/812363; Заявлено 01.07.1977; Опубл. 08.08.1978. - 9 с.↑

A4025. Пат. 4106019 США, МПК G01S13/00, G01S13/10, G01S7/292, G01S007/44. Range resolving doppler radar system / T. F. Alexander, G. J. Griff. - № 05/298094; Заявлено 05.10.1972; Опубл. 08.08.1978. - 29 с.↑

A4026. Пат. 4104634 США, МПК G01S13/00, G01S13/75, H01Q15/18, H01Q15/14, H01Q015/00 и др. Ground plane corner reflectors for navigation and remote indication / P. O. Gillard, K. B. Whiting. - № 05/746152; Заявлено 30.11.1976; Опубл. 01.08.1978. - 19 с.↑

A4027. Пат. 4104632 США, МПК G01S13/00, G01S13/93, G01S009/02. System for preventing collision of vehicles / N. Fujiki, H. Endo. - № 05/740215; Заявлено 09.11.1976; Опубл. 01.08.1978. - 6 с.↑

A4028. Пат. 4104630 США, МПК B61L25/04, B61L25/00, G01S13/00, G01S13/76, G01S009/56. Vehicle identification system, using microwaves / N. E. Chasek. - № 05/698468; Заявлено 21.06.1976; Опубл. 01.08.1978. - 9 с.↑

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A4030. Пат. 4103301 США, МПК G01S13/00, G01S13/52, G01S7/292, G01S009/42. Constant false alarm rate moving target indication radar system (CFAR-MTI) / N. T. Evans. - № 05/588577; Заявлено 20.06.1975; Опубл. 25.07.1978. - 11 с.↑

A4031. Пат. 4101891 США, МПК G01S13/90, G01S13/00, G01S7/41, G01S7/02, G01S009/02 и др. Surface roughness measuring system / J. C. A. N. A. S. Fletcher, N./A.A. Jain. - № 05/744577; Заявлено 24.11.1976; Опубл. 18.07.1978. - 15 с.↑

A4032. Пат. 4101890 США, МПК G01S13/00, G01S7/41, G01S13/53, G01S7/02, G01S009/44 и др. Radar reconnaissance system for track vehicle recognition / P. J.-M. Goyard. - № 05/766935; Заявлено 09.02.1977; Опубл. 18.07.1978. - 5 с.↑

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A4034. Пат. 4101852 США, МПК G01S13/00, G01S13/75, H01Q3/46, H01Q3/00, H03H9/40 и др. Microacoustic shear bulk wave device / M. Epstein, A. L. Nalamwar. - № 05/725195; Заявлено 21.09.1976; Опубл. 18.07.1978. - 5 с.↑

A4035. Пат. 4100544 США, МПК G01S13/00, G01S13/76, G01S3/14, G01S7/28, G01S3/32 и др. Beacon system employing ramped gain receiver / R. V. Keeran. - № 05/818376; Заявлено 25.07.1977; Опубл. 11.07.1978. - 6 с.↑

A4036. Пат. 4097864 США, МПК G01S13/00, G01S13/60, G01S009/42. Radar-operated vehicle safety apparatus / H. Endo, K. Ban. - № 05/786828; Заявлено 12.04.1977; Опубл. 27.06.1978. - 6 с.↑

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A4039. Пат. 4096440 США, МПК G01S13/00, H04Q7/38, H04B001/00. Control system for mobile radio communication / S. Okasaka. - № 05/790044; Заявлено 22.04.1977; Опубл. 20.06.1978. - 12 с.↑

A4040. Пат. 4095666 США, МПК G01S13/00, G01S13/93, B60K027/00, B60K033/00. Apparatus for preventing collision of vehicles / K. Baba, K. Ban. - № 05/783002; Заявлено 30.03.1977; Опубл. 20.06.1978. - 6 с.↑

A4041. Пат. 4093951 США, МПК G01S13/524, G01S13/00, G01S009/42. Compensation for simultaneous platform motion and antenna scanning in MTI radars / T. L. Rhys. - № 05/797207; Заявлено 16.05.1977; Опубл. 06.06.1978. - 17 с.↑

A4042. Пат. 4093950 США, МПК G01S13/524, G01S13/00, G01S009/42. Motion-compensation arrangements for MTI radars / T. L. Rhys. - № 05/797209; Заявлено 16.05.1977; Опубл. 06.06.1978. - 13 с.↑

A4043. Пат. 4093949 США, МПК G01S13/524, G01S13/00, G01S009/02, G01S009/42. Clutter tracker using a smoothed doppler frequency measurement / N. T. Evans. - № 05/690330; Заявлено 26.05.1976; Опубл. 06.06.1978. - 13 с.↑

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A4050. Пат. 4080594 США, МПК G01S13/00, G01S13/56, G08B13/16, G08B013/16, H03K023/00. Doppler shift actuator and intrusion systems / A. L. Plevy. - № 05/705018; Заявлено 14.07.1976; Опубл. 21.03.1978. - 8 с.↑

A4051. Пат. 4079377 США, МПК G01S13/58, G01S13/34, G01S13/00, G01S009/44. FM-CW radar for range and relative speed determination / D. Heiden, G. Neininger, E. Sautter, D. Klippel. - № 05/672760; Заявлено 01.04.1976; Опубл. 14.03.1978. - 11 с.↑

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A4055. Пат. 4072946 США, МПК G01S13/82, G01S13/76, G01S13/00, G01S009/08, G01S009/56. Method and apparatus for measuring the distance between two stations / W. B. S. M. Kneefel. - № 05/712053; Заявлено 06.08.1976; Опубл. 07.02.1978. - 9 с.↑

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A4057. Пат. 4072944 США, МПК G01S13/93, G01S13/00, F42C013/04, G01S009/42. Imminent collision detection apparatus / J. F. Bianco, N. Senio, R. B. Hawes, D. B. Strang. - № 04/808034; Заявлено 20.02.1969; Опубл. 07.02.1978. - 5 с.↑

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A4072. Пат. 4053889 США, МПК G01S13/28, G01S13/00, G01S009/233. Non-linear spread spectrum transmitter/receiver for a homing system / R. H. Johnson. - № 05/709052; Заявлено 27.07.1976; Опубл. 11.10.1977. - 4 с.↑

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A4078. Пат. 4053026 США, МПК B60K31/10, B60K31/06, B60K31/00, G01S13/93, G01S13/00 и др. Logic circuit for an automatic braking system for a motor vehicle / N. Fujiki, H. Endo. - № 05/748701; Заявлено 08.12.1976; Опубл. 11.10.1977. - 9 с.↑

A4079. Пат. 4052722 США, МПК G01S13/58, G01R23/02, G01S13/00, G01R23/00, G01R023/02 и др. Traffic radar and apparatus therefor / K. Millard. - № 05/613302; Заявлено 15.09.1975; Опубл. 04.10.1977. - 12 с.↑

A4080. Пат. 4050071 США, МПК G01S13/60, G01S13/00, G01S009/42. Bi-static radar speed sensor / A. S. Clorfeine. - № 05/687142; Заявлено 17.05.1976; Опубл. 20.09.1977. - 7 с.↑

A4081. Пат. 4049953 США, МПК G01S13/12, G01S13/22, G01S7/36, G01S7/40, G01S13/00 и др. Complex pulse repetition frequency generator / A. B. Evans, J. - № 05/699820; Заявлено 24.06.1976; Опубл. 20.09.1977. - 8 с.↑

A4082. Пат. 4048613 США, МПК G01S13/93, G01S13/00, G08G1/16, G08G001/00. Alarm system for emergency braking / H. Ito, T. Yamanaka, O. Ozeki. - № 05/551719; Заявлено 21.02.1975; Опубл. 13.09.1977. - 6 с.↑

A4083. Пат. 4044355 США, МПК G01F23/284, G01S13/34, G01S13/00, G01S009/24. Measurement of contents of tanks etc. with microwave radiations / K. O. Edvardsson. - № 05/658075; Заявлено 13.02.1976; Опубл. 23.08.1977. - 15 с.↑

A4084. Пат. 4044353 США, МПК G01S13/36, G01S13/00, G01S009/38. Microwave level gaging system / R. Levy. - № 05/712168; Заявлено 06.08.1976; Опубл. 23.08.1977. - 11 с.↑

A4085. Пат. 4042926 США, МПК G01S13/82, G01S13/76, G01S13/00, G01S007/40. Automatic transponder / R. E. Anderson, A. F. Brisken, L.J. R. - № 05/562499; Заявлено 27.03.1975; Опубл. 16.08.1977. - 9 с.↑

A4086. Пат. 4042924 США, МПК G01S13/526, G01S13/00, G01S009/42. MTI clutter tracking and cancelling system / N. T. Evans, F. J. Wunderlich. - № 05/017992; Заявлено 25.02.1970; Опубл. 16.08.1977. - 11 с.↑

A4087. Пат. 4041489 США, МПК G01S13/00, G01S13/10, G01S7/292, G01S007/28. Sea clutter reduction technique / B. L. Lewis. - № 05/482970; Заявлено 25.06.1974; Опубл. 09.08.1977. - 8 с.↑

A4088. Пат. 4041293 США, МПК G01S13/00, G01S13/60, G01P003/42, G06G007/19. Method of measuring the velocity of an object relative to a reference and a device for effecting said method / G. A. Kihlberg. - № 05/615932; Заявлено 23.09.1975; Опубл. 09.08.1977. - 15 с.↑

A4089. Пат. 4039782 США, МПК B60Q1/08, B60Q1/04, G01S13/58, G01S13/00, G01S13/60 и др. Installation for controlling a measuring beam and/or a light beam in motor vehicles / M. H. Burckhardt, J. Paul. - № 05/623451; Заявлено 17.10.1975; Опубл. 02.08.1977. - 6 с.↑

A4090. Пат. 4038655 США, МПК G01S13/95, G01S13/00, G01S009/60. Radar contour edge restore circuit / C. A. Clark, J.R. A. Ito. - № 05/695984; Заявлено 14.06.1976; Опубл. 26.07.1977. - 5 с.↑

A4091. Пат. 4035801 США, МПК G01S13/00, G01S13/70, G01S13/78, G01S009/04. Multiple ranging DME / W. L. Miller. - № 05/646817; Заявлено 06.01.1976; Опубл. 12.07.1977. - 24 с.↑

A4092. Пат. 4035800 США, МПК G01S13/538, G01S13/00, G01S13/02, G01S009/42. Short-pulse non-coherent MTI / B. L. Lewis, B. H. Cantrell. - № 05/725770; Заявлено 23.09.1976; Опубл. 12.07.1977. - 6 с.↑

A4093. Пат. 4035799 США, МПК G01S13/526, G01S13/00, G01S13/64, G01S009/42. Digital mean clutter doppler compensation system / J. K. Hsiao. - № 05/628631; Заявлено 04.11.1975; Опубл. 12.07.1977. - 8 с.↑

A4094. Пат. 4035775 США, МПК G01S13/28, G01S13/00, G10K11/36, G10K11/00, H03H9/42 и др. Temperature compensated acoustic surface wave device / M. B. Schulz, M. G. Holland. - № 05/634948; Заявлено 24.11.1975; Опубл. 12.07.1977. - 11 с.↑

A4095. Пат. 4035760 США, МПК G01S13/58, G01S15/58, G01S15/00, G01S13/00, G01S009/66 и др. Object detecting system / G. F. Asbury, E. J. Kohn, J. R. Richards. - № 03/247186; Заявлено 18.09.1951; Опубл. 12.07.1977. - 12 с.↑

A4096. Пат. 4034373 США, МПК G01S13/00, G01S13/53, G01S13/64, G01S009/42. Airborne moving-target indicating radar system / R. Pierre, G. J. Forgays, H. H. Behling, W. C. Curtis. - № 05/413808; Заявлено 08.11.1973; Опубл. 05.07.1977. - 12 с.↑

A4097. Пат. 4031534 США, МПК G01S13/00, G01S13/08, G01S13/10, G01S009/04. Noise resistant zone penetration detection system / G. T. Kallmann, T. P. Waddell. - № 05/691924; Заявлено 01.06.1976; Опубл. 21.06.1977. - 7 с.↑

A4098. Пат. 4030097 США, МПК G01S13/58, F41G3/00, F41G3/12, G01S13/00, G01S009/44. Muzzle velocity chronograph / A. A. Gedeon. - № 05/654246; Заявлено 02.02.1976; Опубл. 14.06.1977. - 7 с.↑

A4099. Пат. 4028707 США, МПК G01S13/02, G01S13/00, G01V15/00, G01V3/02, H01Q1/04 и др. Antenna for underground pipe detector / J. D. Young, R. Caldecott. - № 05/665924; Заявлено 11.03.1976; Опубл. 07.06.1977. - 17 с.↑

A4100. Пат. 4028662 США, МПК G01S13/93, G01S13/00, G08G1/16, G08G001/00, G01S009/66. Passing vehicle signalling apparatus / R. D. Young. - № 05/689496; Заявлено 24.05.1976; Опубл. 07.06.1977. - 5 с.↑

A4101. Пат. 4027840 США, МПК B61L25/02, B61L25/00, G01S13/75, G01S13/00, G01S009/56. Vehicle position indicator with radar interrogation each of spaced transponders disposed along a pathway for the vehicle / P. K. Blair. - № 05/618184; Заявлено 30.09.1975; Опубл. 07.06.1977. - 4 с.↑

A4102. Пат. 4027307 США, МПК G01S13/93, G01S13/78, G01S13/00, G01S009/56. Collision avoidance/proximity warning system using secondary radar / G. B. Litchford. - № 05/576143; Заявлено 09.05.1975; Опубл. 31.05.1977. - 32 с.↑

A4103. Пат. 4025922 США, МПК A61H3/00, A61H3/06, G01S13/82, G01S13/00, G09B21/00 и др. Traffic control system / J. C. Trawick, I.I.I. - № 05/593377; Заявлено 07.07.1975; Опубл. 24.05.1977. - 12 с.↑

A4104. Пат. 4023175 США, МПК G01S13/89, G01S15/00, G01S15/89, G01S13/00, G01S007/04. Imaging systems / R. C. A. Brown, J. Dow. - № 05/624931; Заявлено 22.10.1975; Опубл. 10.05.1977. - 25 с.↑

A4105. Пат. 4023165 США, МПК G01S13/95, G01S7/04, G01S7/10, G01S13/00, G09G5/42 и др. Signal modification techniques / R. A. Holt, K. C. Adam. - № 05/583186; Заявлено 02.06.1975; Опубл. 10.05.1977. - 10 с.↑

A4106. Пат. 4020490 США, МПК G01S13/92, G01S13/00, G01S009/44, G01R023/14. Traffic radar and apparatus therefor / K. Millard. - № 05/525477; Заявлено 20.11.1974; Опубл. 26.04.1977. - 11 с.↑

A4107. Пат. 4017189 США, МПК G01M11/06, G01S13/02, G01S13/00, G01S009/02, G01J001/00. Testing of automobile headlights / R. F. Bischoff, J. - № 05/579237; Заявлено 20.05.1975; Опубл. 12.04.1977. - 6 с.↑

A4108. Пат. 4016568 США, МПК G01S13/58, G01S13/00, G01S009/44. Method and system for measuring doppler frequency shift of an echo / M. Makimoto, S. Yamashita, Y. Yano, J. Yamamoto. - № 05/537767; Заявлено 31.12.1974; Опубл. 05.04.1977. - 8 с.↑

A4109. Пат. 4016566 США, МПК G01S13/93, G01S13/18, G01S13/00, G01S009/04. Method for avoiding unwanted echo signals and automotive radar embodying same / N. Fujiki. - № 05/643128; Заявлено 22.12.1975; Опубл. 05.04.1977. - 11 с.↑

A4110. Пат. 4016564 США, МПК G01S13/76, G01S13/79, G01S13/00, G01S009/56. Multiple target data receiver for a collision avoidance system / W. L. Ross. - № 05/643479; Заявлено 22.12.1975; Опубл. 05.04.1977. - 8 с.↑

A4111. Пат. 4016563 США, МПК G01S13/28, G01S13/00, G06E3/00, G01S009/00, G06G007/19. Method and apparatus for acousto-optic pulse compression / M. E. Pedinoff. - № 05/581398; Заявлено 27.05.1975; Опубл. 05.04.1977. - 15 с.↑

A4112. Пат. 4015260 США, МПК G01S13/524, G01S13/00, G01S009/42. Digital MTI radar / R. B. Campbell, J. - № 05/085941; Заявлено 02.11.1970; Опубл. 29.03.1977. - 6 с.↑

A4113. Пат. 4015259 США, МПК G01S13/75, G01S13/00, G01S009/56. Method and apparatus for interrogating and identifying fixed or moving targets / A. V. Siverhus, J. A. Matava, D. R. Klose. - № 05/579658; Заявлено 21.05.1975; Опубл. 29.03.1977. - 8 с.↑

A4114. Пат. 4015257 США, МПК G01S13/95, G01S13/00, G01S009/60. Radar detection of turbulence in precipitation / R. W. Fetter. - № 05/612384; Заявлено 11.09.1975; Опубл. 29.03.1977. - 4 с.↑

A4115. Пат. 4014019 США, МПК G01S13/95, G01S13/58, G01S13/00, G01S009/60. Real time analog doppler processor for weather radar / R. W. Fetter. - № 05/612385; Заявлено 11.09.1975; Опубл. 22.03.1977. - 6 с.↑

A4116. Пат. 4012740 США, МПК G01S3/14, G01S13/00, G01S13/44, G01S003/58, G01S009/22. Radio-frequency direction-finding arrangement / W. Lenneper. - № 05/610650; Заявлено 05.09.1975; Опубл. 15.03.1977. - 15 с.↑

A4117. Пат. 4012736 США, МПК G01S13/92, G01S13/00, G01S009/44. Radar speedometer / J. H. Angwin. - № 05/531807; Заявлено 11.12.1974; Опубл. 15.03.1977. - 12 с.↑

A4118. Пат. 4012696 США, МПК G01S13/82, G01S13/00, H04B7/204, H04B14/08, H04B14/00 и др. Multiple rate digital command detection system with range clean-up capability / J. C. A. N. A. S. Fletcher, N./A.J. R. Lesh, S. A. Butman. - № 05/658449; Заявлено 17.02.1976; Опубл. 15.03.1977. - 14 с.↑

A4119. Пат. 4011563 США, МПК G01S13/34, G01S7/35, G01S13/00, G01S7/02, G01S009/02. Variable range automotive radar system / A. D. Robbi. - № 05/655841; Заявлено 06.02.1976; Опубл. 08.03.1977. - 9 с.↑

A4120. Пат. 4011438 США, МПК G01S13/00, G01S13/53, G01S009/42, G06F015/34. Simplified digital moving target indicator filter / M. B. Aufderheide, G. V. Morris. - № 05/641392; Заявлено 17.12.1975; Опубл. 08.03.1977. - 9 с.↑

A4121. Пат. 4010459 США, МПК G01S13/00, G01S13/56, G08B13/24, G08B013/24. Systems for the detection of moving objects within a survey area by microwave diffraction / J. Pontoppidan, E. T. Sorensen, E. K. Nielsen. - № 05/628973; Заявлено 05.11.1975; Опубл. 01.03.1977. - 6 с.↑

A4122. Пат. 4008472 США, МПК G01S7/292, G01S13/00, G01S7/02, G01S13/10, G01S007/28. Marine radar transmission and reception system / T. Nirasawa, H. Ota. - № 05/551917; Заявлено 21.02.1975; Опубл. 15.02.1977. - 28 с.↑

A4123. Пат. 4008471 США, МПК G01S13/93, G01S13/79, G01S13/00, G01S009/56. Correlator to reduce bin straddle in a collision avoidance system / J. R. Hall, J. J. Lyon. - № 05/643026; Заявлено 22.12.1975; Опубл. 15.02.1977. - 4 с.↑

A4124. Пат. 4008469 США, МПК G01S13/02, G01S13/00, G01V3/12, G01S13/88, G01S009/02. Signal processing in short-pulse geophysical radar system / J. C. Chapman. - № 05/495259; Заявлено 06.08.1974; Опубл. 15.02.1977. - 28 с.↑

A4125. Пат. 4006481 США, МПК E02F9/24, G01V8/00, G01S13/02, G01S13/00, H01Q13/10 и др. Underground, time domain, electromagnetic reflectometry for digging apparatus / J. D. Young, C. W. Davis, I.I.I.L. Peters, J.R. Caldecott. - № 05/639249; Заявлено 10.12.1975; Опубл. 01.02.1977. - 10 с.↑

A4126. Пат. 4006477 США, МПК G01S13/00, G01S13/84, G01S009/58. Pulse coherent transponder with precision frequency offset / R. R. Yost, J.E. J. Carlson. - № 05/538700; Заявлено 06.01.1975; Опубл. 01.02.1977. - 11 с.↑

A4127. Пат. 4005417 США, МПК G01S13/00, G01S13/53, G01S009/02. Frequency spectrum analyzer / J. D. Collins. - № 05/604692; Заявлено 14.08.1975; Опубл. 25.01.1977. - 11 с.↑

A4128. Пат. 4004212 США, МПК G01V5/02, G01V5/00, G01V3/12, G01S13/88, G01S13/00 и др. Mine detector system / D. E. Wortman. - № 05/316598; Заявлено 20.12.1972; Опубл. 18.01.1977. - 4 с.↑

A4129. Пат. 4003053 США, МПК G01S13/00, G01S7/292, G01S13/34, G01S009/24. Target adaptive radar system / C. L. Mengel. - № 04/602418; Заявлено 16.12.1966; Опубл. 11.01.1977. - 4 с.↑

A4130. Пат. 4003052 США, МПК G01S13/00, G01S13/52, G01S009/42. Digital prefilter for clutter attenuation in MTI radars / S. Adelman, M. Greenspan. - № 05/641127; Заявлено 15.12.1975; Опубл. 11.01.1977. - 12 с.↑

A4131. Пат. 4003050 США, МПК G01S13/00, G01S13/93, G01S009/56. Full range correlator for use in a collision avoidance system / J. E. Miller. - № 05/569995; Заявлено 21.04.1975; Опубл. 11.01.1977. - 8 с.↑

A4132. Пат. 4001825 США, МПК G01S13/00, G01S13/24, G01S009/02. Pulse radar apparatus / B. W. A. Burgers. - № 05/479469; Заявлено 14.06.1974; Опубл. 04.01.1977. - 13 с.↑

A4133. Пат. 4001822 США, МПК G01S13/00, G01S13/75, G08G1/017, H01Q1/32, G01S009/56. Electronic license plate for motor vehicles / F. Sterzer. - № 05/473765; Заявлено 28.05.1974; Опубл. 04.01.1977. - 13 с.↑

A4134. Пат. 3997900 США, МПК G01S13/60, G01S13/00, H01Q9/04, H01Q13/20, H01Q25/00 и др. Four beam printed antenna for Doopler application / E. G. H. Chin, L. Schwartz. - № 05/557894; Заявлено 12.03.1975; Опубл. 14.12.1976. - 18 с.↑

A4135. Пат. 3996587 США, МПК G01S13/75, G01S13/00, G01S009/56. Semipassive responder utilizing a low voltage, low power drain reflective varactor phase modulator / J. Rosen. - № 05/625884; Заявлено 28.10.1975; Опубл. 07.12.1976. - 5 с.↑

A4136. Пат. 3994229 США, МПК F42C13/00, F42C13/04, G01S13/00, G01S13/50, F42C013/04 и др. Pulse doppler proximity fuze / J. W. Flowers. - № 03/684831; Заявлено 17.09.1957; Опубл. 30.11.1976. - 5 с.↑

A4137. Пат. 3992709 США, МПК G01S13/00, G01S7/36, G01S13/524, G01S009/44. Doppler radar / M. Watanabe, H. Shibuya. - № 05/675816; Заявлено 12.04.1976; Опубл. 16.11.1976. - 10 с.↑

A4138. Пат. 3992708 США, МПК G01S17/00, G01S17/66, F41G3/14, G01S13/86, F41G3/00 и др. Optical tracking analog flywheel / L. R. Olson, J. M. Massey, J. - № 05/597252; Заявлено 18.07.1975; Опубл.

16.11.1976. - 5 с.↑

A4139. Пат. 3991417 США, МПК G01S13/00, G01S13/526, G01S009/42. MTI canceller utilizing fiber optic delay medium and frequency reiteration / L.A. M. - № 05/573782; Заявлено 01.05.1975; Опубл. 09.11.1976. - 5 с.↑

A4140. Пат. 3990076 США, МПК G01S13/53, G01S13/44, G01S13/00, G01S009/42. Pseudo pulse doppler radar / H. H. Naidich. - № 05/580000; Заявлено 22.05.1975; Опубл. 02.11.1976. - 8 с.↑

A4141. Пат. 3988732 США, МПК G01S13/44, G01S13/00, G01S7/02, H01Q25/02, H01Q21/24 и др. 3-Channel selectable polarization, target discrimination antenna / O. G. Brickey. - № 04/515740; Заявлено 22.12.1965; Опубл. 26.10.1976. - 5 с.↑

A4142. Пат. 3987442 США, МПК G01S13/00, G01S13/524, G01S13/526, G01S009/42. Digital MTI radar system / W. W. McLeod, J. - № 05/482814; Заявлено 24.06.1974; Опубл. 19.10.1976. - 10 с.↑

A4143. Пат. 3986167 США, МПК G01S13/78, G01S13/00, G08G1/017, G06F011/08. Communication apparatus for communicating between a first and a second object / J. C. Paul. - № 05/462247; Заявлено 19.04.1974; Опубл. 12.10.1976. - 30 с.↑

A4144. Пат. 3984836 США, МПК G01S13/10, G01S13/00, G01S009/06. Relative distance indicating speedometer for a vehicle / K. Oishi, M. Hinachi, T. Matsui, M. Kotera. - № 05/536962; Заявлено 27.12.1974; Опубл. 05.10.1976. - 5 с.↑

A4145. Пат. 3984835 США, МПК G01S13/84, G01S13/00, G01S13/82, G01S5/14, G06K7/00 и др. Homodyne communication system / G. S. Kaplan, A. D. Ritzie. - № 05/576604; Заявлено 12.05.1975; Опубл. 05.10.1976. - 14 с.↑

A4146. Пат. 3983558 США, МПК G01S13/53, G01S13/00, G01S7/41, G01S7/02, G01S009/42 и др. Moving target indicating (MTI) radar systems employing vehicle discriminator apparatus / O. E. Rittenbach. - № 05/484029; Заявлено 28.06.1974; Опубл. 28.09.1976. - 12 с.↑

A4147. Пат. 3982243 США, МПК B61L3/00, B61L3/12, G01S13/00, G01S13/82, G01S009/56. Device for transmission of information from an information emitter to an information seeker / P.-O. G. Gustavsson, B. A. Morwing. - № 05/520975; Заявлено 05.11.1974; Опубл. 21.09.1976. - 7 с.↑

A4148. Пат. 3981011 США, МПК G01S13/75, G01S13/00, G01S009/56. Object identification system using an RF roll-call technique / W. W. Bell, I.I.I. - № 05/564002; Заявлено 31.03.1975; Опубл. 14.09.1976. - 13 с.↑

A4149. Пат. 3981008 США, МПК G01S13/93, G01S13/00, G01S7/292, G06K9/32, G01S007/44 и др. Navigational and collision avoidance apparatus / J. R. Mann. - № 05/243646; Заявлено 13.04.1972; Опубл. 14.09.1976. - 30 с.↑

A4150. Пат. 3979752 США, МПК G01S13/24, G01S13/00, G01S009/23. Pulse-type radar with modulated carrier frequency / J.-C. Charlot. - № 05/595083; Заявлено 11.07.1975; Опубл. 07.09.1976. - 8 с.↑

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Тематический реферативный сборник патентов США сгенерирован в автоматическом режиме с использованием специализированного программного обеспечения.
Сборник сформирован в рамках выполнения проекта **РФФИ 18-07-01270** "*Создание методики выявления и прогнозирования перспективных направлений развития радиоэлектронных систем, использующих отражение и вторичное излучение радио, акустических и электромагнитных волн в космической, авиационной и наземной технике на базе патентного анализа*"