РЕФЕРАТИВНЫЙ СБОРНИК
патентов США (1976-2018)
(Категория "space")

"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. [A1]

"Accurate timing distribution by high-frequency radio"

A method of obtaining an absolute time reference for a high-frequency (HF) sounding signal includes transmitting a reference signal at a first location and transmitting a sounding signal in close proximity to the transmitting of the reference signal at the first location. The method additionally includes receiving the reference signal at a second location and receiving the sounding signal at the second location. The method further includes determining a relative delay at the second location of the sounding signal in relation to the reference signal. The method also includes determining a propagation mode based upon the relative delay. The method additionally includes determining an absolute time reference based upon the propagation mode being observed. Additional methods and associated systems for implementing the methods are also provided. [A2]

"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. [A3]

"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. [A4]

"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. [A5]

"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. [A6]

"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. [A7]

"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. [A8]

"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. [A9]

"Method for transmitting and receiving radar signals while blocking reception of self generated signals"

A method and apparatus which enables a facility or entity such as ships, airplanes, satellites, and land based sites, that transmits and receives radar signals to receive any incoming radar signal, or any electromagnetic signals in the frequency range of 1 Ghz-30 Ghz, while blocking reception of any signals generated by the facility or entity itself. The method comprises transmitting a primary signal from an rf generator, providing a second signal which is synchronized with the primary signal matching in both phase and amplitude, but with a phase difference of 180 degrees so that the two signals sum to zero. The second signal travels through a voltage controlled attenuator and thru a voltage controlled phase shifter. Combining in a combiner the second signal with a signal radiated by a transmitting antenna and received by a receiving antenna that connects into a transmission enabling mechanism, and then transmitting the combined signal to a detector apparatus. [A10]

"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. [A11]

"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. [A12]

"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. [A13]

"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. [A14]

"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. [A15]

"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. [A16]

"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. [A17]

"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. [A18]

"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. [A19]

"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. [A20]

"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. [A21]

"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. [A22]

"Combining transponder bandwidths for source and forward error correction encoding efficiency"

An apparatus and method for combining transponder bandwidths comprises a wide-band virtual transponder for transmitting a single data stream. The wide-band virtual transponder is comprised of a plurality of narrow-band physical transponders. A plurality of elementary streams are statistically multiplexed to create the single data stream, wherein the single data stream is forward error correction encoded and demultiplexed into a plurality of transponder streams for transmission by the plurality of physical transponders. The physical transponders each use a different portion of a signal spectrum, wherein the different portion may be guard bands or a combination of legacy bands and guard bands. Upon receipt, the transponder streams are multiplexed to recover the single data stream, wherein the recovered single data stream is forward error correction decoded and statistically demultiplexed to recover the plurality of elementary streams. [A23]

"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. [A24]

"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. [A25]

"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. [A26]

"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. [A27]

"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. [A28]

"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. [A29]

"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. [A30]

"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. [A31]

"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. [A32]

"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. [A33]

"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. [A34]

"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. [A35]

"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. [A36]

"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. [A37]

"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. [A38]

"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. [A39]

"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. [A40]

"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. [A41]

"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. [A42]

"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. [A43]

"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. [A44]

"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. [A45]

"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. [A46]

"GPS correction method and system"

GPS correction method comprising providing benchmark GPS devices located respectively at a priori known stationary benchmark points within respective geographical zones, the stationary benchmark points having corresponding benchmark GPS coordinates, providing a benchmark database storing data mapping the GPS devices to the benchmark GPS coordinates of their respective stationary benchmark points and their respective geographical zones, receiving first GPS coordinates associated to objects within the geographical zones and second GPS coordinates associated to the stationary benchmark points measured at a same time period, the first GPS coordinates being transmitted by the benchmark GPS devices and the second GPS coordinates being transmitted by GPS devices associated to the objects, and generating corrected GPS coordinates of the object by measuring a deviation between the benchmark GPS coordinates and the second GPS coordinates and using the deviation for correcting the first GPS coordinates. There is also provided a GPS correction system. [A47]

"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. [A48]

"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. [A49]

"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. [A50]

"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. [A51]

"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. [A52]

"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. [A53]

"Self-reacting message board"

Disclosed is a digital sign system and method of use thereof. The system includes a digital sign having a controller board having a microcontroller, a temperature sensor communicably coupled to fans or a cooling/heating unit, an ambient light sensor, a GPS unit, a radar, a communication module, and a power source, wherein the controller board is in communication with an LED panel or another display module for digitally outputting messages, further wherein the digital sign is mounted on a pilot truck to allow the pilot truck to relay messages to a transport truck and oncoming vehicles. The digital sign is in communication with a second GPS unit disposed on the transport truck so as to track the real-time location of the truck. The digital sign measures the distance between a transport and the digital pilot truck sign and displays the relative distances between the two on the digital message board. In operation, the digital sign is configured to automatically adjust its brightness so as to optimize its visibility while reducing glare to other drivers on the road. [A54]

"Positioning system and method"

According to an embodiment, positioning system includes transmitter apparatus transmits radio wave and receiver apparatus receives target echo. Transmitter apparatus comprises first receiver and transmitter. First receiver

receives GPS signal and outputs reference signal. Transmitter transmits radio wave at time interval based on reference signal. The receiver apparatus includes second receiver, detector and first and second calculators. Second receiver receives GPS signal and outputs time information. Detector receives target echo and outputs reception signal added received time information. First calculator calculates Doppler frequency based on reception frequency and transmission frequency. Second calculator calculates time difference of echo based on Doppler frequency. Detector sets time filter to receive next pulse based on time difference and time information of reception signal. [A55]

"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. [A56]

"Process and system to determine temporal changes in retransmission and propagation of signals used to measure distances, syncronize actuators and georeference applications"

The proposed solution includes the use of four reference bases on the ground at known positions, with a coded time signal transmitted by one of them which is retransmitted by the repeater station and received by each of the reference bases. Using two distinct sets of three reference bases it is possible to calculate the differences between two positions for the repeater station, assigning to the later changes in time, phase or frequency as well as temporal changes due to the signal propagation in the medium, for the respective elevation angles found for the repeater. It can be then identified which values attributed to the temporal changes produces a minimum difference between the two respective positions of the repeater station. The identified temporal change can be used for the correct determination of the repeater station and its use on pertinent applications. [A57]

"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. [A58]

"Location of cooperative tags with personal electronic device"

The present disclosure relates to location and communication systems that can be utilized for locating people, pets and other objects with a software defined radio set. A personal electronic device (PED) such as a cellular telephone, personal data assistant (PDA) or other device that include a software defined radio set can be configured for operation as a locator device. The PED transmits a signal A transponder or micro-transponder (MT) that is tagged to an object is arranged to reply to a transmission received from the PED. The PED based locator is arranged to calculate a distance between the PED and the MT using the time-of-flight (TOF) between the transmission and the receipt of a reply. The absolute geographic position of the PED can be determined using satellite navigation information, while the position of the MT relative to the PED can be determined from the TOF information. [A59]

"Radar antenna device and method for controlling electric power source thereof"

A radar antenna device is provided for rotating an antenna unit which successively emits transmission signals. It is configured to reduce the capacity of an electric power source for supplying electric power to a transmission circuit, a drive unit and the like. A radar antenna device is comprised with an antenna unit and a control unit. The antenna unit is driven by a drive unit to rotate and emits successively transmission signals generated by a transmission circuit into an outer space. After electric power is supplied to the drive unit to be driven, the control unit controls the transmission circuit in response to the transmission start signal from the transmission start signal producer so that the electric power for the transmission will be supplied to the transmission circuit. [A60]

"System and method for improved simultaneous localization and mapping"

A system and method for simultaneous localization and mapping (SLAM) , comprising an improved Geometric Dilution of Precision (GDOP) calculation, a reduced set of feature landmarks, the use of Inertial Measurement Units (IMU) to detect measurement motion, and the use of one-time use features and absolute reference landmarks. [A61]

"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. [A62]

"Navigation signal transmitter and method for generating navigation signal"

Provided is a navigation signal transmitter capable of ensuring reduction in frequency deviation of a terrestrially transmitted navigation signal at low cost. The navigation signal transmitter is operable to receive a transmission wave, generate a synchronization pulse in synchronization with a predetermined data frame, generate an internal clock fundamental oscillation by a reference signal synchronizing section (550) using the synchronization pulse as a reference signal, generate an IMES signal based on the internal clock fundamental oscillation, and transmit the IMES signal. The reference signal synchronizing section (550) comprises a counter circuit (551) , a comparator (553) , a low-pass control filter (554) , a D/A converter (555) and a voltage controlled oscillator (556) . The reference signal synchronizing section (550) is configured to, when a magnitude relationship between the number of clock pulses generated in the voltage controlled oscillator (556) using the synchronization pulse as the reference signal and a reference value falls within a predetermined value and continues a predetermined number of times in one direction, adjust a level of control voltage of the voltage controlled oscillator (556) . [A63]

"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. [A64]

"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. [A65]

"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. [A66]

"Deployed radar panel for space situational awareness"

A monitoring system for a satellite is disclosed. The satellite includes a bus, an optical sensor configured to optically detect objects in a first zone extending from the satellite, and a solar assembly comprising a solar panel and a radar device. The radar device can be configured to detect objects in a second zone, different from the first zone, extending from the satellite in a direction transverse to a surface of the solar panel. [A67]

"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. [A68]

"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. [A69]

"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. [A70]

"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. [A71]

"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. [A72]

"Stabilization system for satellite tracking antenna using gyro and kalman filter and stabilization control method for satellite tracking antenna"

A stabilization control method for a satellite tracking antenna disclosed herein includes outputting a monopulse signal and a gyro signal through a satellite tracking antenna having a gyro mounted thereto, under a situation that disturbance is applied to the satellite tracking antenna, inputting the output monopulse signal and gyro signal into a Kalman filter for stabilization of the satellite tracking antenna, defining a state vector of the Kalman filter based on a pointing-error angle for the satellite tracking, corresponding to the monopulse signal, and a pointing-error angular velocity for the satellite tracking, corresponding to the gyro signal, predicting an original monopulse signal corresponding to a state prior to distortion of the monopulse signal based on the defined state vector, and continuously updating the prediction of the original monopulse signal, and carrying out the stabilization control for the satellite tracking antenna by using the predicted original monopulse signal as a pointing-error-correcting input value. [A73]

"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. [A74]

"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. [A75]

"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. [A76]

"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. [A77]

"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. [A78]

"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. [A79]

"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. [A80]

"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. [A81]

"Radar system and data processing device"

An observation device 1 includes a transmitter and receiver (a transmitter 11, a transmission/reception switch 12, an antenna 13, and a receiver 14) that emits a predetermined radar wave to outside the observation device, and that receives the radar wave scattered by an object existing outside the observation device and acquires a received signal, a temporary image generator 15 that generates a temporary image from the received signal acquired by the transmitter and receiver, and a data transmitter 17 that transmits the temporary image generated by the temporary image generator 15 to a data processing device 2. The data processing device 2 includes a data receiver 21 that receives the temporary image transmitted by the data transmitter 17, and an image generator 24 that generates an image from both the temporary image received by the data receiver 21 and orbit data about a moving object. [A82]

"Terrestrial position and timing system"

A terrestrial positioning and timing system (TPTS) comprising a ground segment and user segment is disclosed that is comprised of a spread-spectrum based range and bearing reference signal, with respect to a reference time, transmitted by an antenna over a broad region of space, and a spread-spectrum based bearing variable signal with bearing specific modulation referenced to a reference time, transmitted using a scanning antenna over a spatial region of space that is more narrow than the spread-spectrum based range and bearing reference signal transmission spatial area. Various embodiments enable the TPTS station and user to support various position, velocity or time services. Most notably, an embodiment with a single TPTS station, active interrogation/transponder reply, and data delivery subsystem can provide a position, velocity, and time solution for the user. Additional

embodiments disclosed provide varying levels of user solutions to include bearing, position, velocity, or time. [A83]

"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. [A84]

"Location of cooperative tags with personal electronic device"

The present disclosure relates to location and communication systems that can be utilized for locating people, pets and other objects with a software defined radio set. A personal electronic device (PED) such as a cellular telephone, personal data assistant (PDA) or other device that include a software defined radio set can be configured for operation as a locator device. The PED transmits a signal A transponder or micro-transponder (MT) that is tagged to an object is arranged to reply to a transmission received from the PED. The PED based locator is arranged to calculate a distance between the PED and the MT using the time-of-flight (TOF) between the transmission and the receipt of a reply. The absolute geographic position of the PED can be determined using satellite navigation information, while the position of the MT relative to the PED can be determined from the TOF information. [A85]

"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. [A86]

"Positioning and tracking device for mapping the movement of a target"

A tracking error covariance matrix updating unit 6 that updates a tracking error covariance matrix P.sub.k (-) before update at a sampling time k by using a nominal distance difference error parameter .sigma..DELTA..sub.rnom and that outputs the tracking error covariance matrix P.sub.k (+) after update is disposed, and a TrackDOP calculating unit 7 calculates an evaluation index TrackDOP for tracking accuracy for a target by using both the tracking error covariance matrix P.sub.k (+) after update, and the nominal observation error parameter .sigma..DELTA..sub.rnom. [A87]

"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. [A88]

"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. [A89]

"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. [A90]

"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. [A91]

"Three-dimensional location of target land area by merging images captured by two satellite-based sensors"

Target land area is three-dimensionally located using an optical sensor and a radar sensor in satellites. The positions of the satellites are measured and images are captured when the sensors point toward land areas. The aiming direction of the optical sensor for each area is measured. The distance between each area and the radar sensor pointing thereto is measured. Images of land areas captured by the sensors and covering common areas are matched. The distance between the target area selected from the common areas and the optical sensor is accurately determined on the basis of the positions of the sensors, the distance between the target area and the radar sensor, and the aiming direction of the optical sensor, which are associated with the images covering the target area. [A92]

"Antenna system"

An antenna system including: an input port configured to receive tracking mode signals, in two orthogonal polarizations, from a target, a tracking coupler, configured to receive the tracking mode signals from the input port, the tracking coupler including: a first pair of opposed slot couplers configured to extract tracking signals from the tracking mode signals in a first one of the orthogonal polarizations, and a second pair of opposed slot couplers configured to extract tracking signals from the tracking mode signals in a second one of the orthogonal polarizations, and a tracking combiner network configured to combine the extracted tracking signals from the pairs of opposed slot couplers to generate tracking output signals for use in controlling the antenna system to track the target. [A93]

"Space time adaptive technique for suppression of spaceborne clutter"

A method for suppressing clutter when detecting objects of interest in a radar system is provided. The method includes defining a plurality of scatterer classes corresponding to a plurality of predetermined scatterer motion types, at least one of the classes corresponding to ballistic acceleration, and at least one of the classes corresponding to non-ballistic acceleration. A plurality of sensor pulses are transmitted, and reflected return pulses are received. Scatterers identified in the radar return signal are associated with one of the scatterer classes. A set of complex weights is generated and applied to the radar return signal data to null scatterers associated with the class corresponding to ballistic acceleration. [A94]

"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. [A95]

"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. [A96]

"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. [A97]

"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. [A98]

"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. [A99]

"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. [A100]

"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. [A101]

"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. [A102]

"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. [A103]

"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. [A104]

"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. [A105]

"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. [A106]

"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. [A107]

"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. [A108]

"Systems and methods for using magnetic field readings to refine device location estimates"

Systems and methods for using magnetic field readings to refine device location estimates are provided. As an example, a plurality of magnetic field readings can be collected by a device as it travels along a path. A positioning system (e.g., GPS) or other sensors can be used to provide a coarse location for the device at each reading. A contribution to each of the magnetic field readings by the Earth's magnetic field can be removed to obtain a plurality of residual readings and a plurality of regions of interest along the path can be identified based at least in part on the residual readings. The regions of interest can be compared to each other to identify a plurality of correspondences between magnetic field readings or residual readings and the plurality of correspondences can be used to refine the location estimates. [A109]

"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. [A110]

"Positioning system utilizing enhanced perception-based localization"

A positioning system and method for determining a position of a machine on a worksite are disclosed. The method may store a map of the worksite which includes one or more known objects in the worksite. The method may determine whether a locating device associated with the machine is accurately providing the position of the machine. The method may also include detecting one or more objects in the worksite. The method may further determine an unmatched object from among the detected objects that does not match the one or more known

objects stored in the map. The method may also store the unmatched object in the map as a known object of the worksite. [A111]

"Method for tracking and forecasting marine ice bodies"

A near-real-time tracking and integrated forecasting of marine ice bodies observable on satellite imagery. [A112]

"Map aware adaptive automotive radar"

A dedicated short range radar system is provided for use with a GPS system. The radar system includes a transmitter which transmits a microwave radio signal. A receiver is coupled to a horizontally scanning receiver antenna array which receives an echo, if present, from the radio signal transmitted by the transmitter. The radio receiver then generates an output signal representative of the echo. A control circuit then receives the output signal from the antenna array as well as the output signal from the GPS system. The control circuit then varies the mode of operation of the receiver and/or the transmitter as a function of the type of roadway for optimal radar performance. [A113]

"Electronic device and method for displaying position information of set device"

An electronic device and method for displaying position information of a set device are provided. The method of operating a first electronic device, which currently communicates with a second electronic device, includes receiving position tracking information from the second electronic device, analyzing the received position tracking information to determine whether an atmospheric pressure within a preset range is sensed, the preset range including an atmospheric pressure sensed by the second electronic device, and, when the atmospheric pressure in the preset range is sensed, comparing position information currently received and the received position tracking information to display position information about the second electronic device. [A114]

"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. [A115]

"GNSS atmospheric estimation with federated ionospheric filter"

Methods and apparatus are presented for estimating environmental parameters from GNSS signals in real time. Some embodiments estimate a float solution using a federated ionospheric filter. Some embodiments fix ambiguities for improved estimates. [A116]

"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. [A117]

"Surveillance image denial verification"

An assessment method and system for characterizing the operation of an imaging system are disclosed. The assessment system can comprise a light source configured to illuminate the imaging system, a modulator configured to modulate light from the light source, a receiver configured to intercept communications from the imaging system, and an analyzer configured to analyze the intercepted communications. The assessment system can be used to determine the effectiveness of an image denial system that is used to prevent a surveillance satellite from providing imagery and can thereby provide an advantage on the battlefield. [A118]

"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. [A119]

"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. [A120]

"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. [A121]

"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. [A122]

"Determining the location of a load for a tower crane"

A tower crane load location determiner is disclosed. One example includes a load location measurer to provide load location measurement information for a load coupled with a tower crane. In addition, a load position determiner utilizes the load location measurement information to determine a location of the load. A user accessible load location provider provides the determined location of the load. [A123]

"Systems and methods for providing antenna calibration"

Systems and methods for providing antenna calibration can be used in a variety of applications. A method of calibrating an antenna array for use in a traffic advisory system or traffic alert and collision avoidance system provide a mechanism that renders complex combining circuitry unnecessary in the array. A method can include receiving an unsolicited reply that contains absolute position information of an intruder aircraft. The method can also include determining a bearing of a signal encoding the reply based on a phase relationship of the signals from an antenna array not configured to operate with an internal self-test phase calibration mechanism. The method can further include comparing the bearing based on the phase relationship with a bearing calculated by a comparison of the absolute positions of a host aircraft and the intruder aircraft. The method can additionally include calibrating the antenna array based on the result of the comparison. [A124]

"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. [A125]

"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. [A126]

"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. [A127]

"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. [A128]

"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. [A129]

"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) . [A130]

"GPS signal reception apparatus and method"

A Global Positioning System (GPS) signal reception apparatus including a GPS antenna unit, a GPS signal selection unit, and a jamming signal detection unit is provided. The GPS antenna unit includes a first-type antenna and a plurality of second-type antennas which have directivities different from each other. The GPS signal selection unit selects any one of the first-type antenna and the plurality of second-type antennas as a selected antenna. The jamming signal detection unit detects a jamming signal present in a GPS signal by analyzing the GPS signal which is received via the selected antenna. [A131]

"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. [A132]

"Adaptable transponder for multiple telemetry systems"

The present invention is a stackable telemetry circuit board for use in telemetry systems for satellites and other purposes. The present invention incorporates previously-qualified interchangeable circuit boards, or "decks," that perform functions such as power, signal receiving and transmission, and processing. Each deck is adapted to serve a range of telemetry applications. This provides flexibility in the construction of the stackable telemetry circuit board and significantly reduces the cost and time necessary to develop a telemetry system. [A133]

"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. [A134]

"Micro-baseline GPS angular determination"

A method of determining a position of a target is disclosed. A position of a targeting instrument relative to a friendly asset is established. A signal from the friendly asset is transmitted. The signal from the friendly asset is received at first and second locations associated with the targeting instrument. An orientation of the targeting instrument relative to the friendly asset is determined based on when the signal is received at the first and second locations. The position of the targeting instrument relative to the friendly asset is compared with the orientation of the targeting instrument relative to the friendly asset, to thereby determine the orientation of the target relative to the targeting instrument. [A135]

"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. [A136]

"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. [A137]

"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. [A138]

"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) . [A139]

"Multidirectional target detecting system and method"

A method and system for investigating and displaying an image of an area of interest comprising a moving vehicle, at least one processor for producing an image of the area of interest, at least one first transmitter for emitting first signals substantially in a first direction, the at least one first transmitter being operatively associated with the moving vehicle and the processor, at least one first receiver for receiving backscattered signals resulting from the first radar signals, the at least one first receiver being operatively associated with the moving vehicle and the processor, at least one second transmitter operatively for emitting second signals in a direction substantially opposite to the first direction, the at least one second transmitter being operatively associated with the moving vehicle and the processor, at least one second receiver for receiving backscattered signals resulting from the second signals, the at least one second receiver being operatively associated with the moving vehicle and the processor, a GPS subsystem for providing position data relating to the position of the vehicle, the at least one first receiver and the at least one second receiver operating to provide image data to the at least one processor, the at

least one processor operating to combine image data from the at least one first receiver and the at least one second receiver with the position data to form a single image, and a display to display the combined image data. [A140]

"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. [A141]

"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. [A142]

"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. [A143]

"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. [A144]

"Device and method for three-dimensional positioning"

A device and method for three-dimensional positioning are provided. The three-dimensional positioning of a common reference point is determined by fusion of supplied measurements, taking into account a lever arm compensation between the reference point, a global navigation satellite system (GNSS) receiver antenna, at least one radar antenna, and an inertial measuring unit. [A145]

"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. [A146]

"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. [A147]

"System and method for real-time locating"

A locating system, includes at least one initiator configured to operate at a first clock frequency, and to transmit a

measurement signal including a first preamble, and at least one transponder configured to operate at a second clock frequency, to receive the measurement signal, and to transmit a response signal to the initiator, the response signal including a second preamble. The initiator is further configured to calculate, based on the response signal, a distance between the initiator and the transponder for determining a location of the transponder. [A148]

"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. [A149]

"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. [A150]

"Combining transponder bandwidths for source and forward error correction encoding efficiency"

An apparatus and method for combining transponder bandwidths comprises a wide-band virtual transponder for transmitting a single data stream. The wide-band virtual transponder is comprised of a plurality of narrow-band physical transponders. A plurality of elementary streams are statistically multiplexed to create the single data stream, wherein the single data stream is forward error correction encoded and demultiplexed into a plurality of transponder streams for transmission by the plurality of physical transponders. The physical transponders each use a different portion of a signal spectrum, wherein the different portion may be guard bands or a combination of legacy bands and guard bands. Upon receipt, the transponder streams are multiplexed to recover the single data stream, wherein the recovered single data stream is forward error correction decoded and statistically demultiplexed to recover the plurality of elementary streams. [A151]

"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. [A152]

"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. [A153]

"Positioning system, terminal apparatus, control method of terminal apparatus"

The terminal apparatus has: base station and terminal error information generating means for generating base station and terminal error information indicating a rate of the base station and terminal frequency difference with respect to the official frequency, geostationary satellite and terminal difference information generating means for generating geostationary satellite and terminal difference information indicating a geostationary satellite and terminal frequency difference, geostationary satellite and terminal error information generating means for generating geostationary satellite and terminal error information indicating a rate of the geostationary satellite and terminal frequency difference with respect to the geostationary satellite frequency, base station frequency error information generating means for generating base station frequency error information indicating a frequency error of a transmitting radio wave from the communication base station based on the base station and terminal error. [A154]

"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. [A155]

"Apparatus and method for capturing cosmic background radiation and converting the same to electricity"

There is provided an apparatus for capturing cosmic background radiation and for converting cosmic background radiation into electricity. An antenna is configured so as to capture cosmic background radiation. An electrostatic electron multiplier is connected to the antenna. A high voltage power supply is connected to the electrostatic electron multiplier whereby cosmic background radiation is converted to electricity. [A156]

"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. [A157]

"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. [A158]

"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. [A159]

"GPS position tracking method with variable updating rate for power conservation"

A system and method in which the position update rate is adaptively modified, based on previous position measurements. By adjusting the update rate based on velocity predictions from two or more position fixes, a lower update rate may be used without exceeding the maximum error. Lowering the update rate reduces power consumption in the UE, providing longer battery operation. The updating method may comprise periodically repeating the velocity prediction and periodically adjusting the update rate responsive thereto. The update rate may be adjusted using additional information such as an acceleration prediction, a minimum update rate, or a preferred error. In some embodiments a model for user movement may be used to provide more accurate predictions, for example, stationary, walking, jogging, city driving, and freeway driving. The updating method may comprise receiving user input regarding the maximum position error. [A160]

"Apparatus and method for testing emergency locator beacons"

An emergency locator beacon testing and communication system is described. The system uses privately-owned Local User Terminals which provide direct feeds to a privately-operated beacon information processor having dedicated on-line servers for consolidating and providing access to beacon test information. The system receives beacon signals relayed through the Cospas-Sarsat satellite system, correlates the beacons' unique identification numbers (UIN's) in the received signals to the UIN's of beacons known to be undergoing testing, collects the data transmitted by beacons under test, and displays beacon test results in a useful format on a user-friendly website. [A161]

"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. [A162]

"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. [A163]

"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. [A164]

"Positioning system, terminal apparatus, control method of terminal apparatus"

The terminal apparatus has: base station and terminal error information generating means for generating base station and terminal error information indicating a rate of the base station and terminal frequency difference with respect to the official frequency, geostationary satellite and terminal difference information generating means for generating geostationary satellite and terminal difference information indicating a geostationary satellite and terminal frequency difference, geostationary satellite and terminal error information generating means for generating geostationary satellite and terminal error information indicating a rate of the geostationary satellite and terminal frequency difference with respect to the geostationary satellite frequency, base station frequency error information generating means for generating base station frequency error information indicating a frequency error of a transmitting radio wave from the communication base station based on the base station and terminal error. [A165]

"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. [A166]

"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. [A167]

"GPS-installed all-azimuth camera and spatial data collecting device"

The present invention provides a GPS-installed all-azimuth camera, comprising at least a pair of GPS antennas (29a and 29b) disposed on up and down in parallel to each other, a plurality of cameras (28a-28f) which are disposed on a plane running in parallel to the GPS antennas and are capable of obtaining images in all azimuths, and a case (27) for accommodating the cameras and the GPS antennas, wherein a reference position of the GPS antennas is concurred with an image reference position of the cameras. [A168]

"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. [A169]

"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. [A170]

"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. [A171]

"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. [A172]

"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. [A173]

"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. [A174]

"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. [A175]

"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. [A176]

"Method of using a microwave and millimeter frequency bistatic radar for tracking and fire control"

A method of using a bistatic passive radar system for tracking a plurality of targets utilizing transmitted radar signals from at least one satellite platform in a geosynchronous orbit with the earth, a radar receiver capturing signals from a reflection of the transmitted radar signals from each target, tracking a position of each target over time, and a processing method for computation of a fire control solution of each target. [A177]

"GPS position tracking method with variable updating rate for power conservation"

A system and method in which the position update rate is adaptively modified, based on previous position measurements. By adjusting the update rate based on velocity predictions from two or more position fixes, a lower update rate may be used without exceeding the maximum error. Lowering the update rate reduces power consumption in the UE, providing longer battery operation. The updating method may comprise periodically repeating the velocity prediction and periodically adjusting the update rate responsive thereto. The update rate may be adjusted using additional information such as an acceleration prediction, a minimum update rate, or a preferred error. In some embodiments a model for user movement may be used to provide more accurate predictions, for example, stationary, walking, jogging, city driving, and freeway driving. The updating method may comprise receiving user input regarding the maximum position error. [A178]

"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. [A179]

"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. [A180]

"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. [A181]

"Method and apparatus for processing satellite signals at a satellite positioning system receiver"

Method and apparatus for processing satellite signals in an SPS receiver is described. In one example, the satellite signals are correlated against pseudorandom reference codes to produce correlation results. A determination is made whether the SPS receiver is in a motion condition or a stationary condition. The correlation results are coherently integrated in accordance with a coherent integration period. The coherent integration period is a value that depends upon the motion condition of the SPS receiver. [A182]

"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. [A183]

"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. [A184]

"Passive radar utilizing space-borne digital electromagnetic illuminators"

In a passive radar system a space-borne transmitter broadcasts wide-band digitally modulated signals over a region and illuminates the region. A receiver antenna is oriented to receive radiation from at least one portion of the region. The portion is an area viewed by the receiver antenna. A reference antenna is oriented toward the transmitter, the reference antenna receives a portion of the wide-band digitally modulated signal. A coherent processing time duration is selected based on: a radar cross-section of a target within the viewed area, a bandwidth of the wide-band digitally modulated signal, and the viewing angle of the receiver antenna. The received signal from the receiver antenna is coherently processed with a reference signal from the reference antenna, over a time interval greater than the coherent processing time duration. [A185]

"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. [A186]

"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. [A187]

"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. [A188]

"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. [A189]

"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. [A190]

"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. [A191]

"Microwave and millimeter frequency bistatic radar tracking and fire control system"

A bistatic passive radar system for tracking at least one target utilizing means for transmitting radar signals from at least one satellite platform in a geosynchronous orbit with the earth, means for receiving radar signals from a reflection from each target, means for tracking a position of each target over time, and means for computation of a fire control solution of each target. [A192]

"Method of cross-correlation and continuous wave interference suppression for GPS signal and associated GPS receiver"

A method for processing weak indoor signals in presence of cross-correlation or continuous wave interference and associated GPS receiver are provided. The method comprises providing a two-dimensional delay-Doppler accumulated power pattern having a plurality of accumulated powers corresponding to frequency and time, for a predetermined frequency, determining an average value of accumulated powers of the two-dimensional delay-Doppler accumulated power pattern over a plurality of times, and subtracting the average value from the accumulated powers used in determining the average at the frequency over the plurality of times to generate a delay-Doppler accumulated power pattern with suppressed interference effect. [A193]

"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. [A194]

"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. [A195]

"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. [A196]

"Method and system for calibration of a radio direction finder"

A calibration method and a system for providing calibration data for use with a direction finder are provided. The method comprises providing a relative motion of a calibration receiver in a circle manner with respect to calibration transmitter at a predetermined distance from each other. The method also includes preparing and transmitting a communication frequency signal employed for transmitting a certain frequency from a list of predetermined frequencies. The preparing comprises: (a) setting a value of the dwell time ranges of the communication frequency signal to a predetermined value, (b) synchronizing in time the dwell time ranges between the calibration transmitter and the calibration receiver by using clock signals of a common synchronization source, (c) providing a hop duration time interval within the dwell time range for transmitting the frequency, and (d) generating the communication frequency signal corresponding to the frequency during the hop duration interval. At the calibration receiver end, the method includes scanning the list of predetermined frequencies, intercepting a frequency signal transmitted during the hop duration time interval within the dwell time ranges, and rejecting all other frequency signals received within the dwell time ranges having duration different than the hop duration time interval by the receiver. [A197]

"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. [A198]

"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. [A199]

"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. [A200]

"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. [A201]

"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. [A202]

"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. [A203]

"Pseudo GPS aided multiple projectile bistatic guidance"

A guidance system for guiding each of several projectiles toward a moving target has a platform having a radar system for illuminating the target with a radar signal. Each projectile has a receiver for receiving the radar signal reflected from the target, a transponder for replying to Global Positioning System (GPS) like timing signals from several timing signal sources, and a data link transceiver for establishing a bidirectional data link to the platform. The data link carries the measured frequency shift of the radar signal reflected from the target as measured by the projectile. A computer on the platform computes a relative position of each projectile with respect to the target from tracking the moving target using the radar system and the reply signal from the transponder on each projectile. The data link sends guidance commands from the platform to each projectile to guide the projectile to the target. [A204]

"Bistatic and multistatic system for space situational awareness"

Provided is a bistatic and multistatic system for detecting and identifying a target in close proximity to an orbiting satellite. An electromagnetic fence is established to surround the satellite, using a ground-based communication uplink from a gateway antenna. A contact or breach of the electromagnetic fence by the target is detected by the satellite, or at other sensor locations, and an exact position, range and ISAR image of the target is calculated using scattered RF energy from the fence. Identification data is transmitted to satellite system monitors, whereby the data is used to decide on a corrective course of action. [A205]

"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. [A206]

"System and method for near-field electromagnetic ranging"

A system for measuring distance between a first locus and a second locus includes: (a) at least one beacon device, a respective beacon device of the at least one beacon device being situated at the first locus and transmitting a respective electromagnetic signal, and (b) at least one locator device, a respective locator device of the at least one locator device being situated at the second locus and receiving the respective electromagnetic signal. The respective locator device is situated at a distance from the respective beacon device within near-field

range of the respective electromagnetic signal. The respective locator device distinguishes at least two characteristics of the respective electromagnetic signal. The respective locator device employs the at least two characteristics to effect the measuring. [A207]

"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. [A208]

"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. [A209]

"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. [A210]

"Methods and arrangements to enhance gridlocking"

The present invention is in the area of gridlocking or sensor registration. Embodiments encompass systems of process and/or equipment to format tracks from more than one sensor to be compared or correlated by statistical and/or optical correlation techniques to provide coordinate transformations between one or more of the sensors based upon the objects or a subset of the objects tracked by each sensor. Embodiments may take into account determinations or calculations regarding tracks describing the same object by different sensors and may take into account errors in those determinations by comparing pairs of tracks associated with more than one object at the same or substantially the same time. Further, many embodiments comprise software that can execute on a laptop, desktop, or similar computer. [A211]

"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. [A212]

"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. [A213]

"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. [A214]

"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. [A215]

"Medium earth orbit satellite surveillance system and antenna configuration therefore"

A radar surveillance system includes a plurality of satellites a plurality of medium earth orbit satellites to provide continuous, long dwell coverage of a region of interest. Each satellite has an antenna having a main reflector and a subreflector electromagnetically coupled to the main reflector. A phased array generates multiple electromagnetic beams positioned so the electromagnetic beams reflect from the subreflector onto said main reflector. The system may be used in determining slow moving targets using a combination of monopulse anomaly and target spectral width measurements. The system also performs synthetic aperture radar imagery and focussed area fast moving target detection using alternating slope linear frequency modulated pulses. The plurality of medium Earth orbit satellites include a self-contained communications system consisting of high bandwidth self-relay crosslinks, high bandwidth downlink, and direct broadcast downlinks for processed data. [A216]

"Multi-station HF FMCW radar frequency sharing with GPS time modulation multiplexing"

Systems and methods are described for HF radar frequency sharing with GPS time modulation multiplexing. A method is provided that includes generating clock signals from the time information contained in a GPS signal. Radio frequency signals are transmitted and received in a sequence whose start times are dictated by the clock signals. The clock signals also control the modulation of the radio frequency signals. The radio frequency signals are modulated by using a sweep modulation. An apparatus to implement the method includes a GPS receiver, a state machine, a clock generator, a microprocessor, a memory chip, a signal synthesizer, and a digital data output device. The GPS receiver extracts time information from GPS signals. The state machine controls radar functions versus time. The microprocessor performs modulation multiplexing on radar signals. [A217]

"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. [A218]

"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. [A219]

"Method of compensating for atmospheric effects while using near horizon radar utilizing a Doppler signal"

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 structured to send a signal indicating the position and velocity of said 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 indicating an apparent location of the satellite, and a second receiver, located at a distance from the radar site, structured to receive the satellite signal and which indicates the observed location of the satellite. The first receiver is utilized to receive a signal from the satellite when the satellite is at a low elevation. This signal indicates the apparent location and velocity of the satellite. The bending angle can then be determined by comparing the apparent location data of the satellite as determined by the first receiver to the observed location data of the satellite. The satellite signal is used to determine the Doppler shift of the signal at the radar site as compared to the signal from the observed location. The Doppler shift data is used to determine the bending angle. 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. [A220]

"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. [A221]

"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. [A222]

"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. [A223]

"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. [A224]

"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. [A225]

"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. [A226]

"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. [A227]

"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. [A228]

"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. [A229]

"Enhancements for GPS based bi-static radar"

A bi-static radar system is disclosed. The bi-static radar system comprises a system of positioning signal transmitters transmitting positioning signals, at least one of the positioning system signal transmitters being carried on a pseudolite. The bi-static radar system also comprises a receiving platform, the receiving platform having at least two antennas, a first antenna receiving positioning signals from the positioning signal transmitters, and a second antenna receiving reflected positioning signals from a target. [A230]

"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. [A231]

"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. [A232]

"System and method for using impulse radio technology to track the movement of athletes and to enable secure communications between the athletes and their teammates, fans or coaches"

A system, electronic device and method are provided that utilize the positioning capabilities of impulse radio technology to track one or more moving athletes. The movement of these athletes can be displayed on a television, a handheld unit or an Internet site. In addition, the present invention can utilize the communication capabilities of impulse radio technology to enable secure communications to take place between an athlete and their teammates, fans or coaches. The athletes can include, for example, track and field athletes, baseball players, football players, basketball players, soccer players or hockey players. [A233]

"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. [A234]

"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. [A235]

"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. [A236]

"Satellite surveillance system and method"

A radar surveillance system includes a plurality of satellites a plurality of medium earth orbit satellites to provide continuous, long dwell coverage of a region of interest. Each satellite has an antenna having a main reflector and a subreflector electromagnetically coupled to the main reflector. A phased array generates multiple electromagnetic beams positioned so the electromagnetic beams reflect from the subreflector onto said main reflector. The system may be used in determining slow moving targets using a combination of monopulse anomaly and target spectral width measurements. The system also performs synthetic aperture radar imagery and focussed area fast moving target detection using alternating slope linear frequency modulated pulses. The plurality of medium Earth orbit satellites include a self-contained communications system consisting of high bandwidth self-relay crosslinks, high bandwidth downlink, and direct broadcast downlinks for processed data. [A237]

"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. [A238]

"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. [A239]

"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. [A240]

"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. [A241]

"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. [A242]

"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. [A243]

"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. [A244]

"Process for evaluating phased array antennas"

A process for evaluating the radar pattern of a phased array antenna subsystem by utilizing transmissions from a global positioning satellite. This process utilizes a delayed radar target on a moving platform, a remote differential global positioning receiver on the moving platform, a fixed global positioning receiver on the phased array antenna, and a communication data link between the remote global positioning receiver and the fixed global positioning receiver. In the first step of the process a first signal is radiated from the radar source towards the delayed radar target, then a first radar reply is received from the delayed radar target, then a second signal is received from the

global positioning satellite at the remote global positioning receiver from the global positioning satellite, and then a third signal is received at the fixed global positioning receiver from the remote global positioning receiver, via the GPS data link, and then a fourth signal is transmitted from the said global positioning satellite to the fixed global positioning receiver. [A245]

"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. [A246]

"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. [A247]

"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. [A248]

"System and method for using impulse radio technology in the farming field"

A system, electronic monitor and method are provided that utilize impulse radio technology to enable a farmer to accurately track a position of an object (e.g., farm equipment, farm animal, farm employee) as the object moves around a farm and/or to enable a farmer to monitor a variety of parameters associated with the moving farm equipment. In addition, the system, electronic monitor and method can utilize impulse radio technology to help control either remotely or automatically one or more pieces of farm equipment. [A249]

"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. [A250]

"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. [A251]

"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. [A252]

"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. [A253]

"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. [A254]

"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. [A255]

"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. [A256]

"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. [A257]

"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. [A258]

"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. [A259]

"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) . [A260]

"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. [A261]

"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. [A262]

"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. [A263]

"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. [A264]

"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. [A265]

"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. [A266]

"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. [A267]

"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. [A268]

"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. [A269]

"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. [A270]

"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. [A271]

"Data communications network"

A method (200, 300) and apparatus (100) provides for displaying locally the position and identity of various field operatives or agents who have radio receiver transmitters (20, 30 and 40) . A local control station (10) transmits a request for identification to radios (20, 30 and 40) . Each radio responds back with a message (226) giving its location. The local control station then displays the identity and location of the unit on an area map (234) and stores the information in memory (236) . Control station 10 further designates some or all of the radios (20, 30 and 40) with a laser designator signal (60) . The radio then responds with an IFF signal (318) if it is a friendly agent. [A272]

"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. [A273]

"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. [A274]

"Passive ranging using global positioning system"

A method for determining distance from a target to an observation station using a Global Positioning System satellite as a radiation source and first and second observation station located receivers. The first receiver receives reflected position determinative satellite radio frequency signals and the second receiver receives direct position determinative satellite radio frequency signals. The time difference between satellite radio frequency signals arriving at the first and second receivers is calculated and combined with difference distance data and angular, azimuth and elevational position data and the distance from the target to observation point is determined. [A275]

"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. [A276]

"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. [A277]

"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. [A278]

"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. [A279]

"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. [A280]

"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. [A281]

"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. [A282]

"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. [A283]

"Method and device for measuring the distance between two stations connected by a communications channel"

The invention relates to a method and a device for distance measuring between two stations (A1, B1) connected

by a communication channel. The method is based on a command structure, wherein the satellite (A1, B1) , by means of which a distance is to be determined, sends a range request (3) via an inter-satellite communication channel to the other satellite (A1or B1) , which thereupon acknowledges this range request (3) with an answer (4) . The distance is determined from the corresponding measurement of the cycle time. The range request (3) and the corresponding answer (4) are transmitted in a multiplexed communication channel. [A284]

"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. [A285]

"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. [A286]

"Device for mapping dwellings and other structures in 3D"

A micropower impulse radar is used to take measurements, such as those needed to establish room size and the dimensions and location of objects within the walls of a room. A computer controls the scanning of the radar and the collection of datapoints. A global positioning satellite (GPS) unit locates the precise portion of the radar and another unit loads a fixed referenced location to which all measurements from different rooms are baselined. By collecting points and referencing them to a common point or wireframe representation of a building can be developed from which "as built" architectural plans can be produced. [A287]

"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. [A288]

"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. [A289]

"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. [A290]

"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. [A291]

"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. [A292]

"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. [A293]

"Navigation/guidance system for a land-based vehicle"

A navigation/guidance system uses a dead reckoning navigator with periodic GPS fixes to correct the drift of the inertial system. The navigation system primarily uses speed sensed by Doppler radar and attitude and heading sensed by a set of gyros. The navigation system uses various processes to compensate for any sensor errors. The

system uses attitude data to compensate for GPS leverarm errors. The system can be used on a land-based vehicle to economically and accurately provide navigation data. [A294]

"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. [A295]

"Method and apparatus to automatically generate a train manifest"

A system located in a region to determine information about an unknown car relative to a moving train includes first and second satellite navigation receivers, first and second transceivers and first and second controllers. The moving train includes a first car, and the region includes the moving train and the unknown car. The region is defined by points at which radio communication with the first car is possible. The first satellite navigation receiver, located in the first car, provides first location data, and the second satellite navigation receiver, located in the unknown car, provides second location data. The first transceiver is located in the first car, and the second transceiver is located in the unknown car. The first controller, located in the first car, reads the first location data from the first satellite receiver at a first time and sends via the first transceiver a first request to the second transceiver at the first time. The second controller, located in the unknown car and responsive to the first request received via the second transceiver, reads the second location data from the second satellite receiver and sends via the second transceiver a first response to the first transceiver, the first response including the second location data, wherein the first controller receives via the first transceiver the response and calculates a first distance from a first difference between the first and second location data. Alternatively, the first controller polls the region for unknown cars. An unknown car responds with it identification number. The first controller has a Doppler receiver to determine whether the unknown and responding car is moving with respect to the first controller. From the Doppler indications of all responding cars, the first controller determines a train manifest, and then transmits the manifest and equipment status via satellite to a central station. [A296]

"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) . [A297]

"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) . [A298]

"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) . [A299]

"Location detector and monitor and method of using the same"

A location detector and monitor removably attached to a person utilizing a stationary monitoring computer, a satellite, and three spaced signal dishes. The satellite sends out, in response to the monitoring computer sending out a signal, a microwave signal received by the three dishes linked by telephone line to the monitoring computer. The latter plots the location of the person by the use of cartesian coordinates from the information provided by the three dishes. [A300]

"Coherent detection architecture for remote calibration of coherent systems using direct sequence spread spectrum transmission of reference and calibration signals"

An architecture that provides for coherent detection of the relative amplitude and phase of a calibration signal used in the remote calibration of an active transmitting or receiving phased array system employs two coherent signals, one being a reference signal and the other being the calibration signal that contains the relative amplitude and phase information desired in the calibration process. Direct sequence spread spectrum techniques are used to transmit the two coherent signals. Continuous time binary antipodal waveform signals are generated and used to transmit the reference and calibration signals. Relevant amplitude and phase information needed for the calibration can be extracted while compensating for non-synchronized oscillators and the effects of Doppler shifts due to relative motion of the transmitting and receiving platforms. The detection architecture is effective for satellite-based phased array systems, including geostationary, medium and low earth orbit communication satellites, and space-based synthetic aperture radar reconnaissance satellites. [A301]

"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. [A302]

"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. [A303]

"Electronic landmark enhancement to GPS based navigation systems"

A system and apparatus for enhancing the satellite based navigation systems which includes providing an aircraft with an interrogating radar for interrogating beacons disposed at a predetermined location in front of a runway wherein the beacons are radar-activated passively powered runway beacons. [A304]

"Electronically-scanned two-beam antenna"

An electronically-scanned two-beam antenna designed for being installed on board a moving platform, and in particular a satellite. The antenna of the invention comprises a single, complex reflector whose reflectivity is responsive to the polarization with which it is illuminated, and associated with two arrays of orthogonally-polarized sources that illuminate the complex reflector using an offset configuration. The complex reflector is made up of two

reflectors placed one in front of the other in the beam propagation direction. The first reflector is transparent to a first linear polarization and reflective to an orthogonal polarization, while the second reflector is reflective at least for the first polarization. The two resulting beams thus propagate in different directions, both parallel to the trajectory of the platform. Electronic scanning is provided in a plane perpendicular to the orbit plane. The invention is applicable to stereoscopic radars for observing the earth from a satellite, and also to radiometry. [A305]

"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. [A306]

"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. [A307]

"Burst tone range processing system and method"

A burst tone range processing system for determining the distance between a ranging station and a signal re-transmitting target device, generates a burst tone signal of finite duration and transmits the signal along a delay transmission path from the ranging station to the target and along a reference transmission path within the ranging station. The transmitted signals are received from the reference and delay paths and assigned time tags. The signals are then correlated and the time tags assigned to correlated signals are compared. [A308]

"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. [A309]

"Method and system for N-track correlation"

A computer system and method for accurately transforming multiple returns received by multiple satellites from multiple targets into a set of single accurate tracks for each target. Observations from multiple satellites create partial or resulting tracks. These resulting tracks are then correlated with pre-existing base tracks by a series of steps in which resulting tracks are paired with pre-determined base tracks according to a series of criteria. Pairs based on: common observation points and time spans, common satellites, and lack of common satellite, are considered sequentially. The final attempt at correlation consists of pairing each remaining track with each base track and using profile dependent piece correlation of the pairs. Any remaining resulting tracks are then added to the set of base tracks. [A310]

"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. [A311]

"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. [A312]

"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. [A313]

"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. [A314]

"High resolution radar system for high speed and satellite vehicles"

A radar system mounted on a satellite is scanned to provide surveillance of large areas such as the oceans. The transmitter oscillator generates bursts in the frequency range from about 20-250 megacycles. A receiver detects signals reflected from objects in the target area. The receiver enhances the value of recurrent components of selected time interval portions of the received signals. In one embodiment the transmitter bursts are modulated in accordance with a predetermined modulation pattern. The system determines to what extent it corresponds to the predetermined modulation pattern and then enhances the value of the recurrent components of the received signals. The enhancement is of those recurrent components having relative phases which change by substantially uniform increments. [A315]

"Satellite equipment for measuring the backscatter coefficient of the sea"

Satellite radar apparatus measures the backscatter coefficient of the sea to determine the speeds and directions of winds at sea. The apparatus implements three aiming directions per swath with the track thereof on the Earth being parallel. The radar technique used operates by pulse compression, and on reception noise is measured in parallel with the measurement of signal plus noise. The apparatus includes an assembly for calibrating the product of transmission power multiplied by reception gain, which assembly includes a servo-control loop connected to the transmission line via a directional coupler. [A316]

"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. [A317]

"Passive ranging through global positioning system"

To passively measure the range to a target, GPS signals which are scattered by the target are used to determine the distance from the target to an observation station whose position P.sub.o is determined by a GPS technique. If the delay time from the reflected signal of the target can be measured, the position P.sub.t of the target can be calculated. Four simultaneous nonlinear equations from the four satellites can be written as where i=1, 2, 3, 4 represent the four satellites having positions, P.sub.i, C is the speed of light, t.sub.ito is the time for the satellite signal travelling from the ith satellite to P.sub.t then to P.sub.o. The trace of P.sub.t forms ellipsoidal surfaces with respect to P.sub.i and P.sub.o. The point where the ellipsoidal surfaces intercept represents the position of the target. If only the distance between the target and observation station is of interest, this distance can be estimated easily. The distances from the target and the observation station to the satellite are about 20,000 km, whereas the distance R.sub.ot between the target and observation station is probably less than 100 km. Therefore the distance can be estimated as where t.sub.io is the time for the satellite signal to travel from satellite i to the observation point which is already known from the conventional GPS approach. In the above equation, only the reflection from one satellite is required. [A318]

"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. [A319]

"Passive universal communicator system"

A communication system includes a base station, called a "Controller" and one or more remote or satellite stations, each called a "Communicator". The controller arbitrates, controls and communicates with the communicators which are in range to receive its transmissions. The communicators receiving a particular controller's transmission form a network for that controller for the period in which reception occurs. The controller is the only generator of electromagnetic radiation which it modulates with information relating to its own identity, transactions it undertakes and information it transfers. Each communicator modulates and re-radiates the received transmission using back-scatter. Back-scatter re-radiation keeps the communicator design simple and allows for very sensitive receiver design in the controller. In operation, the controller initiates communication with each communicator by establishing, through a handshake exchange, the unique communications channel it will maintain with that communicator. Once channels are established, the controller repetitively polls each communicator for a sequential, cumulative interchange of data. The controller continually looks out for new communicators entering its network and de-activates polling of communicators whose transactions are complete. Whenever a network is not active because there are no communicators present, or any in need of a transaction or data interchange, the controller polls at a reduced rate. [A320]

"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. [A321]

"Modulated range tone system"

A range tone system for determining the range between a satellite or spacecraft and a ground station FM modulates one of a 3968 Hz, 283 Hz or 35 Hz range tone onto a 27.77 Khz range tone. Modulation is accomplished by simultaneously addressing a plurality of PROMs by related clocks. The PROMs are preprogrammed with data representing the 27.77 KHz tone frequency-modulated by another range tone. Narrow-band filtering recovers the 27.77 KHz range tone from the received signal, and frequency demodulation coupled with narrowband filtering recovers the lower-frequency tone. The two recovered tones are processed simultaneously to provide both high resolution range information together with ambiguity resolution. [A322]

"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. [A323]

"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. [A324]

"Bessel beam radar system using sequential spatial modulation"

A spatially modulated Bessel beam radar system for enhancing the resolution with which a range and an azimuth of a plurality of closely spaced targets is determined. In a Bessel beam radar system, a Bessel beam is generated by sequential spatial modulation of the radar signal while maintaining a constant spatial polarization, and the return signal from one or more targets is processed to determine its Bessel function content. To spatially modulate the radar beam, the point at which the radar signal is transmitted is moved around a circular orbit. In a first embodiment of the spatially modulated Bessel beam radar system (80) , a radar dome (86) mounted on the distal end of a mast (84) is pivoted around an orbit (90) . The radar signal is transmitted in a predefined direction, along a Poynting vector that is generally aligned with the plane of the orbit. In a second embodiment (110) , a plurality of parabolic antennas (116) are arranged in a spaced-apart circular array around a common center. The radar signal is sequentially spatially modulated as it is transmitted from each of the parabolic antennas in sequence around the circular array, and the Poynting vector of the spatially modulated Bessel beam radar signal is generally transverse to a plane in which the parabolic antennas are disposed. The signal reflected back from plural targets comprises a complex phase history. To determine a range and azimuth for each target, a controller/processor (180) , processes this signal to develop closed form Bessel functions from which target azimuth and range are determined. Alternatively, target azimuth is determined from a convolution of the complex phase history using a dot product detector (202) . [A325]

"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. [A326]

"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. [A327]

"Portable target locator system"

A portable target locator system capable of being transported and utilized by an individual combatant is disclosed. The portable target locator system comprises a rifle-like target locator and a transmitter/modem capable of transmitting target location coordinates to a weapons delivery system. The rifle-target locator preferably includes a Global Positioning System (GPS) receiver capable of determining the location coordinates of the target locator automatically and with a high degree of accuracy from signals transmitted from a network of orbiting satellites. A laser rangefinder and digital azimuth and inclination sensor are then utilized to accurately determine the range, azimuth and inclination of an identified target from the target locator. This information is then processed in conjunction with the location coordinates of the target locator to generate location coordinates for the selected target. The target location coordinates are then coupled to the transmitter/modem for transmittal to a remotely located control system, such as a weapons delivery system. In one preferred embodiment of the present invention a non-volatile memory is provided and multiple target coordinate sets are then stored within the memory and subsequently transmitted to the weapons delivery system during a single transmission. [A328]

"Detection of burst signal transmissions"

A method is disclosed for detecting the presence of and synchronizing to burst transmissions which contain repeated acquisition codes. The received signal is applied as an input to a surface acoustic wave (SAW) filter which is matched to detect one repetition of the code. The SAW filter correlation output is sampled at times corresponding to the times of arrival of each repetition of the code. The mean value and variance of the correlation values for each repetition are computed, and the system declares an acquisition when the mean value and variance meet certain criteria. [A329]

"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. [A330]

"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. [A331]

"Antenna tracking system"

An antenna tracking system tracks a primary antenna to follow a moving signal source, such as a communication satellite. A secondary antenna has a greater beam width than the primary antenna and receives the same tracking signal from the satellite. The primary antenna is tracked according to a predetermined search pattern which causes a variation in the signal amplitude depending upon the relative location of the satellite and the antenna position. The signal strength signals from the two antennas are input to a summation function which takes the difference of the two signals. The noise and signal variation component of the two signals is substantially the same and is therefore eliminated from the resulting difference signal. An antenna control unit utilizes the resulting difference signal to select the optimum signal strength for the particular step of the search pattern. This system is particularly applicable to high frequency communication channels in the higher (86 Ghz and above) frequency band which are

subject to atmospheric distortion and noise. [A332]

"Radar system for multiple object tracking and discrimination"

A radar system for tracking a plurality of individual objects that form a cluster. The system comprises means for producing in real time reference information indicative of the position of a reference point associated with the mean position of the objects, and means for producing in real time displacement information indicative of the relative position of each object with respect to the reference point. The system may handle a transmitter, and the means for producing the displacement information may include a interferometer system comprising a central receiver, a pair of first satellite receivers positioned on opposite sides of the central receiver along a first axis that passes through the central receiver, and a pair of second satellite receivers positioned on opposite sides of the central receiver along a second axis that passes through the central receiver and that is inclined with respect to the first axis. The displacement information produced by the interferometer system indicates the position of each object with respect to a virtual coordinate system having one axis coincident with a line from the central receiver to the reference point. Means are described for determining the relative phases and relative arrival times of radar pulses reflected from the objects at each of the recivers. for each receiver, the relative phase and relative arrival time of each return pulse may be transferred to the virtual coordinate system by a separate processor dedicated to that receiver. Separate processors may also be associated with each object, to process the virtual data corresponding to that object and to produce the displacement information for the object. [A333]

"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. [A334]

"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. [A335]

"Method and system for orbiting stereo imaging radar"

This radar system makes it possible to collect complete stereo data in a single pass by utilizing an orbiting, side looking, bi-static, synthetic aperture radar. This system utilizes at least two orbiting spacecraft in synchronous parallel orbits with each other and separated by a tether. A transmitter transmits radar signals to a planet's surface which are reflected back and received by two receivers, one carried by each spacecraft. When the signals are combined, the layover produces a three dimensional picture in which vertical height information may be determined. [A336]

"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. [A337]

"Simplified frequency scheme for coherent transponders"

A coherent transponder having a transmitter and a receiver operating at different frequencies with each including a numerically controlled oscillator for controlling the frequency thereof through a single-sideband modulator and

various outputs from a phase-locked loop the frequencies of the numerically controlled oscillators and the phase-locked loop being referenced to a single crystal controlled oscillator. [A338]

"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. [A339]

"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. [A340]

"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. [A341]

"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. [A342]

"Ramp function generator"

A control circuit having a digital memory for providing sweep voltages to ceivers in a doppler satellite tracking station of proper amplitude and duration to ensure searching in the correct doppler frequency range. An internally generated ramp function voltage is combined with a reference voltage to produce a composite sweep signal for the receiver. The reference voltage level is determined either from a set of digi-switches or from a digital memory circuit which outputs a digital signal that is a function of the frequency of a received doppler signal. [A343]

"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. [A344]

"Circuit for generating a digital or analog signal as a function of doppler frequency"

A control circuit having a digital memory for providing sweep voltages to ceivers in a doppler satellite tracking station of proper amplitude and duration to ensure searching in the correct doppler frequency range. An internally generated ramp function voltage is combined with a reference voltage to produce a composite sweep signal for the receiver. The reference voltage level is determined either from a set of digi-switches or from a digital memory circuit which outputs a digital signal that is a function of the frequency of a received doppler signal. [A345]

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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*"