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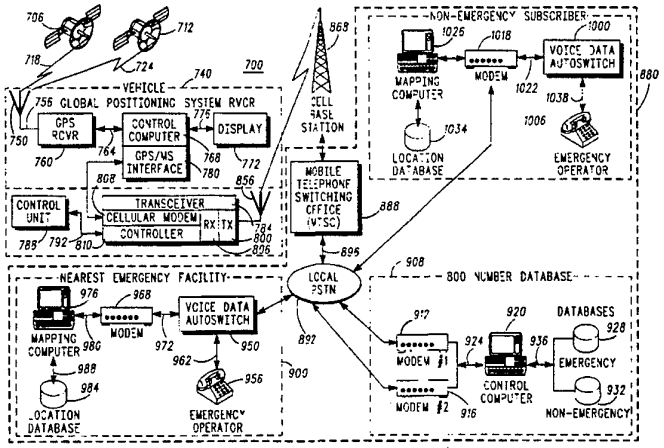

(57) Abstract

A communication system (200), and associated method, which permits a user of a remote-site transceiver (340) operable in a cellular communication system to receive information, including telephonic identification codes, associated with the geographic area in which the remote-site transceiver is located. The remote-site transceiver (340) includes circuitry to receive signals generated by global position system satellites, thereby permitting the geographic location of the remote-site transceiver to be ascertained. The remote-site transceiver thereafter transmits signals identifying the geographic location thereof to a base station (268) of the cellular communication system. The base station (268), in turn, accesses information stored in a memory (984) associated with the geographic area in which the transceiver is located. When the stored information includes telephonic identification codes of emergency facilities associated with various areas, the telephonic identification code of a most-appropriate emergency facility is provided to the transceiver, thereby permitting a telephonic communication link to be effectuated with the most-appropriate, emergency assistance facility.

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CELLULAR COMMUNICATION SYSTEM HAVING INFORMATION RETRIEVAL AND METHOD THEREFOR

Field of the Invention:

The present invention relates generally to cellular communication systems and, more particularly, to a system, and associated method, in which information is provided to a radiotelephone.

Background

A cellular communication system is one type of radio communication system. Radio transceivers (conventionally referred to as radiotelephones or cellular phones) operative in such a cellular communication system contain circuitry permitting generation and reception of modulated signals. The remotely-positioned transceivers, referred to as (base-stations), are physically connected to a conventional telephonic network to permit communication between a radiotelephone and a fixed site of a conventional, telephonic network. (A fixed site of the conventional, telephonic network may also, of course, comprise a base-station capable of transmitting modulated signals to a radio transceiver, thereby permitting communication between two radio transceivers.) A cellular communication system is formed by positioning numerous base-stations at spaced-apart locations throughout a geographical area. Each base-station contains circuitry to receive modulated signals transmitted thereto by one, or many, radiotelephones.

Radiotelephones operative in such a cellular communication system have been designed to be of various types of constructions. Most of such radiotelephone constructions may, however, be classified as being of either of two general construction-types, namely, a construction-type generically referred to as a "mobile phone" and a construction-type generically referred to as a "portable phone." (A third construction-type, generically referred to as a "transportable phone", has many of the characteristics of a portable phone.)

A mobile phone is designed to be mounted fixedly in a motor vehicle. Since these mobile phones are typically fixedly mounted in the motor vehicle, portability of such a mobile phone is oftentimes limited. A portable phone, conversely, is of reduced physical dimensions, thereby to permit convenient carriage of such a portable phone on the person of a user thereof. However, a portable power supply (typically a rechargeable battery) must be carried with the portable phone to permit operation of such phone.

Use of a radiotelephone in a cellular communication system permits the user to communicate telephonically without any fixed connection to a conventional, telephonic network. Calls may be initiated by the user, or calls may be initiated by another and received by the user, similar to telephonic communication in a conventional, wireline telephonic network. Because no fixed connection is required with the conventional telephonic network, use of such transceivers allows the user to communicate telephonically during times when the user would otherwise be unable to communicate telephonically upon a conventional, wireline network (such as, e.g., while the user is operating a motor vehicle).

Use of such a radiotelephone in a cellular communication system is perhaps of greatest benefit in event of emergency, as an emergency report or a request for emergency assistance may be made to appropriate emergency personnel. However, a user of the radiotelephone for such an emergency purpose must be able to identify the location at which the call is initiated.

In this scenario of usage, however, telephonic communication by way of a cellular communication system varies somewhat with communication solely by way of a conventional, wireline telephonic network. When a telephone of a conventional, wireline telephonic network is utilized to make an emergency report to or to request assistance from emergency personnel, by dialing an appropriate emergency number (which, in the United States usually comprises the number 9-1-1 dialed in sequence), emergency personnel located most-proximate (or otherwise positioned to respond best to the call) to the location of the telephone are summoned. However, when a radiotelephone operative in a cellular communication system is utilized to make the emergency report to or to request assistance by dialing the same appropriate emergency number, the emergency personnel summoned may not be located most-proximate (or otherwise positioned to respond best to the call) to the location from which the emergency request is initiated. As a result, delays may occur as the appropriate emergency personnel may subsequently need to be notified of the emergency report or request.

What is needed, therefore, is means by which most-appropriate emergency personnel may be summoned when an emergency number is dialed by a

user of a radiotelephone operative in a cellular communication system.

Summary of the Invention:

The present invention, accordingly, advantageously provides a communication system that overcomes the limitations of the existing art and which further advantageously provides one using the communication system with information heretofore not readily available to one utilizing a radiotelephone in a cellular communication system.

According to one aspect of the immediate invention, a remote cellular radiotelephone includes a first receiver portion for receiving communication signals from a cellular radiotelephone base station and a transmitter for transmitting communication signals to the cellular radiotelephone base station. The remote cellular radiotelephone also includes a second receiver portion for receiving communication signals comprised of positional information identifying the geographic positioning of the remote cellular radiotelephone. The second receiver portion is coupled to the transmitter whereby the remote cellular radiotelephone is operative to transmit the positional information received thereat to the base station and receive information from the cellular radiotelephone base station associated with the location information transmitted to the base station.

According to another aspect of the immediate invention, a method for operating a remote-site transceiver operatively coupled to at least one fixed-site base-station to obtain data associated with a geographical area in which the remote-site transceiver is located includes receiving in a remote site receiver

positional information from a global position system. The remote site transceiver transmits the positional information, received by the remote-site transceiver to the fixed-site base-station. The remote-site transceiver receives information associated with the location of the remote-site transceiver from the fixed-site base station.

Further advantages and features of the system and method of the preferred embodiments of the present invention will be better understood by reading the detailed description of the preferred embodiments hereinbelow.

Brief Description of the Drawings:

The present invention will be better understood when read in light of the accompanying drawings in which:

FIG. 1 is a schematic representation of a cellular communication system;

FIG. 2 is a block diagram of global position system satellites, a fixed-site base-station, and a remote-site radio transceiver, here positioned within a motor vehicle, which is operative to receive signals transmitted thereto by the global position system satellites and operative both to transmit and to receive signals to and from the fixed-site base-station;

FIG. 3 is a block diagram of the fixed-site base-station and the remote-site radio transceiver shown in FIG. 2;

FIG. 4 is a partial block, partial schematic view of a communication system of a further preferred embodiment of the present invention; and

FIG. 5 is a flow diagram listing the method steps of the method of the preferred embodiment of the present invention.

Description of the Preferred Embodiments:

Cellular communication systems are operable throughout many geographic areas. Accordingly, in order for useful geographically specific information to be provided to a remote-site radiotelephone user, the location of the radiotelephone from which the request is initiated is first ascertained. Such positional information is utilized to provide one using the radiotelephone with information associated with the geographic area proximate to the location of the radiotelephone.

A radiotelephone operable in a cellular communication system contains circuitry to permit transmission and reception of modulated signals, thereby to permit two-way communication between the radiotelephone and a fixed-site transceiver. In a cellular communication system, the fixed-site transceivers are typically referred to as base-stations.

Referring first to the schematic representation of FIG. 1, a portion of a cellular communication system, referred to generally by reference numeral 10, is shown. The cellular communication system is formed by positioning numerous base-stations at spaced-apart locations throughout a geographical area. The base-stations are indicated in FIG. 1 by points 12, 16, 20, 24, 28, 32, 36, and 40. While the figure illustrates eight separate base-stations, it is to be understood, of course, that an actual, cellular communication system is conventionally comprised of a large plurality (of a

number greatly in excess of the eight base-stations illustrated in FIG. 1) of base-stations. Each base-station, represented by a point 12-40, is fixedly-positioned and contains circuitry to receive modulated signals transmitted by one, or many radiotelephones, and to transmit modulated signals to the one, or many, radiotelephones. Each base-station 12-40 is coupled to a conventional, wireline, telephonic network. Such connection is represented in the figure by line 44, shown in dash, interconnecting the base-station represented by point 40 and wireline network 48. Connections between wireline network 48 and other ones of the base-stations 12-36 may be similarly shown.

The positioning of each of the base-stations 12-40 forming the cellular communication system is carefully selected to ensure that at least one base-station is positioned to receive a modulated signal transmitted by a radiotelephone positioned at any location throughout the geographic area encompassed by cellular communication system 10. That is to say, at least one base-station 12-40 must be within the transmission range of a radiotelephone positioned at any such location throughout the geographical area. (Because the maximum signal strength, and, hence, maximum transmission range, of a signal transmitted by a base-station is typically greater than the maximum signal strength, and corresponding maximum transmission range, of a signal generated by a radiotelephone, the maximum transmission range of a signal generated by a radiotelephone is the primary factor which must be considered when positioning the base-stations of the cellular communication system.)

Because of the spaced-nature of the positioning of the base-stations, portions of the geographical area

throughout which base-stations 12-40 are associated with individual ones of the base-stations. Portions of the geographical area proximate to each of the spaced-apart base-stations 12-40 define "cells" which are represented in the figure by areas 112, 116, 120, 124, 128, 132, 136, and 140 surrounding the respective base-stations 12, 16, 20, 24, 28, 32, 36, and 40. Cells 112-140 together form the portion of the geographical area of cellular communication system 10 illustrated in FIG. 1. A radiotelephone positioned within the boundaries of any of the cells of the cellular communication system may transmit, and receive, modulated signals to, and from, at least one base-station represented by points 12-40.

Line 152 extending in a generally-vertical direction in FIG. 1 defines zones 154 and 158 formed at the left-hand side portion and right-hand side portion, respectively, of the figure. Zones 154 and 158 are representative of geographic areas associated with particular emergency assistance networks. When an emergency number is dialed by one utilizing a telephone of a conventional, telephonic network and located in zone 154, telephonic communication is effectuated with the particular emergency assistance network associated with zone 154. Similarly, when an emergency number is dialed by one utilizing a telephone of a conventional, wireline, telephonic network and located in zone 158, telephonic communication is effectuated with the particular emergency assistance network associated with zone 158.

However, when an emergency number is dialed by one utilizing a radiotelephone operable in cellular communication system 10, and the radiotelephone is located in, for instance, zone 154, telephonic communication is not necessarily effectuated with the

particular emergency assistance network associated with zone 154.

For instance, when an emergency number is dialed by one utilizing the radiotelephone when the radiotelephone is located in cell 128 at a location indicated by a X-marking 164, a communication link is normally effectuated with fixed-site base-station 28, and the base-station 28 is located within zone 158. In such instance, telephonic communication is effectuated between the radiotelephone located at the position identified by X-marking 164 and the particular emergency assistance network associated with zone 158.

In such an instance, effectuation of emergency assistance, if necessary, to one located at the position by X-marking 164 is likely to be delayed as personnel of the particular emergency assistance network associated with zone 158 must notify personnel of the particular emergency assistance network associated with zone 154 so that personnel of the emergency assistance network associated with zone 154 may provide the necessary assistance.

By advantageously utilizing the information which may be generated by circuitry similar to conventional, and commercially-available, global position system receivers, one utilizing a radiotelephone to dial an emergency number in the communication system of the preferred embodiments of the present invention, is assured of effectuating a telephonic communication link with an appropriate emergency assistance network.

That is to say, and with reference to the representation of FIG. 1, one utilizing a radiotelephone, when positioned at a location indicated by X-marking 164, to dial an emergency number forms a telephonic, communication link with the particular emergency

assistance network associated with zone 154 rather than with the emergency assistance network associated with zone 158.

Turning next to the partial schematic, partial block diagram of FIG. 2, the elements of the communication system referred to generally by reference numeral 200, of a preferred embodiment of the present invention are shown.

Global position system satellites 206 and 212 generate signals 218 and 224, respectively.

Remote-site transceiver 240, here shown to be mounted within vehicle 246, includes antenna 250 which is operative to receive signals 218 and 224 generated by satellites 206 and 212, respectively. Antenna 250 is further operative to generate electrical signals representative of signals 218 and 224 and to provide such signals to receiver circuitry of remote-site transceiver 240. A first portion of the receiver circuitry of transceiver 240 is operative in a manner similar to operation of conventional, global system receivers to determine positional information of the transceiver 200 responsive to values of the signals representative of 218 and 224 received by antenna 250. In general, the first portion of the receiver circuitry of transceiver 240 permits determination of such positional information responsive to phase values of signals 218 and 224 as well as coded information contained in signals 218 and 224.

Radio transceiver 240 further includes transmitter circuitry permitting transmission, by way of antenna 256, of modulated signals 262 to a fixed-site base-station 268. (It should be noted that separate antennas 250 and 256 are shown for purposes of illustration; a single antenna may, of course, be constructed to be

operative in a manner equivalent to operation of antennas 250 and 256.)

Fixed-site base-station 268 is operable not only to receive signals 262 transmitted thereto, but is operable further to transmit modulated signals 274 which may be received by antenna 256 of remote-site transceiver 240. And, a second portion of the receiver circuitry of transceiver 240 is operative in a manner similar to operation of the receiver circuitry of a radiotelephone operable in a cellular communication system. Thereby, two-way communication is permitted between remote-site 240 and fixed-site base-station 268.

In manners analogous to those described previously with respect to FIG. 1, base-station 268 is coupled to a wireline network 280; such connection is indicated by line 284. The transmitter circuitry of remote-site transceiver 240 and a portion of the receiver circuitry thereof are together operative in a manner analogous to the operation of a radiotelephone operative in a cellular communications system.

Computer data base 288 is further illustrated as being connected to wireline network 280 by way of line 292 or to fixed-site base-station 268 by way of line 296, shown in dash. Data stored within computer data base 288 is accessible by circuitry of wireline network 280 and then by fixed-site base station 268 or directly with fixed-site base-station 268.

Remote-site transceiver 240 is operative to determine positional information responsive to reception by receiver circuitry thereof of signals 218 and 224 generated by satellites 206 and 212. The positional information which identifies geographic positioning of transceiver 240, once determined by the transceiver, is thereafter transmitted to a fixed-site base-station of a

cellular communication system, here base-station 268. The positional information, once received by base-station 268 is provided to computer data base 288, and data stored in computer data base 288 associated with the geographic positioning of transceiver 240, as indicated by the geographical positioning of transceiver 240, is provided to base-station 268 for transmission therefrom to remote-site transceiver 240.

In such manner, information associated with the geographic positioning of remote-site transceiver 240 is provided to the transceiver.

In a preferred embodiment, the data stored in computer data base 288 comprises telephonic identification codes (i.e., telephone numbers) of emergency assistance organizations associated with various geographic areas. When positional information of remote-site transceiver 240 is provided to base-station 268, and the contents of computer data base 288 are accessed, base-station 268 transmits to remote-site transceiver 240 the telephonic identification code of the emergency assistance organization most appropriate for the location of transceiver 240.

Remote-site transceiver 240 preferably further includes appropriate circuitry or algorithms to cause the transmitter circuitry of transceiver 240 to initiate a communication link with the emergency assistance organization associated with the telephonic identification code accessed by the computer data base 288.

In a further preferred embodiment of the present invention, communication system 200 is operative not only for emergency purposes, but further for purposes of providing one utilizing remote-site transceiver 240 with information pertaining to the geographic area in which transceiver 240 is located. For instance, data may

be stored in computer data base 288 pertaining to telephonic identification codes of commercial business locations located in the general vicinity of the geographic positioning of remote-site transceiver 240. Additional information, in addition to the telephonic identification codes, may, of course, additionally be provided to one utilizing remote-site transceiver 240.

Turning next to FIG. 3, a remote-site transceiver, similar to remote-site transceiver 240 of communication system 200 of FIG. 2 and here identified by reference numeral 340, is shown. A fixed-site base-station, similar in nature with that of base-station 268 of FIG. 2 and here identified by reference numeral 368, is also shown. Transmission of modulated signals between remote-site transceiver 340 and fixed-site base-station 368 is accomplished in manners analogous to transmission of modulated signals between remote-site transceiver 240 and fixed-site base-station 268 of FIG. 2.

Remote-site transceiver 340 is comprised of global position system receiver circuitry portion 444 and cellular transceiver circuitry portion 448. Global position system receiver circuitry portion 444 includes antenna 450 which is operative to receive signals generated by global position system satellites (such as satellites 206 and 212 of FIG. 2). The signals received by antenna 450 are provided by way of line 454 to global position system receiver circuitry 460.

Receiver circuitry 460 includes demodulation circuitry for demodulating the signal applied thereto on line 456 and for generating a signal on line 464 which is applied to global position system control computer circuitry 468. Computer circuitry 468 is operative to determine the geographic positioning of remote-site transceiver 340 responsive to the signals transmitted

thereto by global position system satellites. Computer circuitry 468 is coupled to display element 472 by way of line 476 and also to interface circuitry 480. Interface circuitry 480 forms an interface between computer circuitry 468 and the circuitry of cellular transceiver circuitry portion 448 of remote-site transceiver 340.

Cellular transceiver circuitry portion 448 is shown to be comprised of transceiver circuitry 484 and control unit 488. Transceiver circuitry 484 and control unit 488 are connected theretogether by way of bus 492. Interface circuitry 480 of global position system receiver circuitry portion 444 is connected to bus 492 by way of line 496.

Transceiver circuitry 484 is comprised of transmitter circuitry 500 and receiver circuitry 506. Both transmitter and receiver circuitry portions 500 and 506 are coupled to antenna 556 which is analogous to antenna 256 of transceiver 240 of communication system 200 of FIG. 2.

Fixed-site base-station 368 is comprised of transceiver circuitry portion 568 and computer data base circuitry portion 588. Portion 588 corresponds to computer data base 288 of communication system 200 of FIG. 2.

Fixed-site base-station 368 is further shown to include control computer 592, modem 596, and wireline network interface 600. (As computer data base circuitry portion 588 is shown in the figure as a portion of fixed-site base-station 368, the illustrated embodiment of FIG. 3 is representative of an embodiment in which the computer data base is connected directly to the base-station, such as that indicated by line 296 interconnecting computer data base 288 and base-station 268 of communication system 200 of FIG. 2.)

Transceiver circuitry portion 568 is shown to be comprised of transmitter circuitry 606 and receiver circuitry 612. Modem 596 is coupled to transmitter circuitry 606 by way of line 618 and receiver circuitry 612 is coupled to modem 596 and wireline interface 600 by way of line 624.

Computer data base circuitry 588 is shown to be comprised of storage element 630 and computer control circuit 636. Circuit 636 and storage element 630 are connected theretogether by way of line 642. And, computer circuit 636 is coupled to modem 596 by way of line 648.

Because receiver circuitry 612 of transceiver circuitry portion 568 is coupled to modem 596 and computer circuit 636 is also coupled to modem 596, positional information transmitted to fixed-site base-station 368 from remote-site transceiver 340 is provided to computer circuit 636 to permit accessing of particular storage locations of storage element 630. Once the particular storage locations of storage element 630 are accessed and the stored data contained therein is ascertained, signals indicative of such stored data are transmitted by transceiver circuitry 606 to remote-site transceiver 340. As noted previously, data stored in computer data base circuitry 588, and, more particularly, in storage element 630 thereof, includes emergency telephonic identification codes and also telephonic identification codes of non-emergency locations as well as other information. Thereby, responsive to positional information provided to the fixed-site base-station 368 of the geographic positioning of remote-site transceiver 340, information may be provided to the remote-site transceiver 340.

Turning next to the partial block, partial schematic view of FIG. 4, communication system 700 of a further preferred embodiment of the present invention is shown. Similar to communication system 200 of FIG. 2, communication system 700 includes global position system satellites, here satellites 706 and 712, which generate modulated signals 718 and 724, respectively. Again, the signals generated by satellites 706 and 712 include phase information as well as coded information.

Remote-site transceiver 740 of communication system 700 includes global position system receiver circuitry portion 744 and cellular transceiver circuitry portion 748.

Global position system receiver circuitry portion 744 of remote-site transceiver 740 includes antenna 750 operative to receive modulated signals 718 and 724 generated by satellites 706 and 712. Antenna 750 converts the modulated signals received thereat into electrical signals on line 756 which are applied to global position system receiver circuitry 760. Receiver circuitry 760 includes demodulation circuitry for demodulating the signals applied thereto and for generating signals on line 764 which are applied to global position system control computer 768. Receiver circuitry portion 744 further comprises display element which is coupled computer circuitry 768 by way of line 776. And, interface circuitry 780 is coupled to control computer circuitry 768.

Cellular transceiver circuitry portion 748 of remote-site transceiver 740, similar to circuitry portion 448 of FIG. 3, is comprised of transceiver circuitry 784 and control unit 788. Transceiver circuitry 784 and control unit 788 are connected theretogether by way of bus 792. And, transceiver circuitry 784 is coupled to

interface circuitry 780 of the global position system receiver circuitry portion 744 by way of line 796. Transceiver circuitry 784 is again shown to be comprised of both receiver circuitry, here receiver circuitry 800, and transmitter circuitry, here transmitter circuitry 806. Transmitter and receiver circuitry 800 and 806 of transceiver circuitry 784 are coupled to antenna 856 which is operative to transmit modulated signals therefrom and to receive modulated signals transmitted thereto. In the preferred embodiment illustrated in the figure, transceiver circuitry 784 includes cellular modem 808 and controller 810. Modem 808 is coupled to interface 780 by way of line 796 and controller 810 is coupled to control unit 788.

Fixed-site base-station 868 includes transceiver circuitry operative to transmit modulated signals to cellular transceiver circuitry portion 748 of remote-site transceiver 740 and to receive modulated signals transmitted thereto by the remote-site transceiver. Base-station 868 is connected to wireline network 880 by way of line 884.

Wireline network 880 is shown to be comprised of a mobile telephone switching office 888 which is coupled to a local public switched telephone network 892 by way of line 896. Local telephonic network 892 includes appropriate switching circuitry to form connections with wireline locations including emergency assistance facility 900, a representative, non-emergency facility 906, and computer data base 908.

Computer data base 908 is shown to be comprised of first and second modems 912 and 916, respectively, which permit coupling to local telephonic network 892, control computer 920, which is coupled to modems 912 and 916 by way of bus 924, and emergency and non-

emergency data bases 928 and 932 which are coupled to control computer 920 by way of bus 936.

Emergency assistance facility 900 is shown to include switching circuitry 950, conventional wireline telephone 956, coupled to switching circuitry 950 by way of line 962, modem 968, coupled to switching circuitry 950 by way of bus 972, mapping computer 976 coupled to modem 968 by way of bus 980, and data base 984 which is coupled to mapping computer 976 by way of bus 988. Similarly, non-emergency facility 906 is shown to be comprised of switching circuitry 1000, wireline telephone 1006 which is coupled to switching circuitry 1000 by way of line 1012, and modem 1018 which is coupled to switching circuitry 1000 by way of bus 1022. Facility 906 is further shown to include mapping computer 1026 to which data base 1034 is coupled by way of bus 1038. In a preferred embodiment of the present invention, emergency assistance facility 900 is associated with a particular telephonic-identification code, in the United States preferably an 800-type number which is accessible by a caller located at any position within the coverage area of a cellular communication system. (An 800-type number is prefereably utilized in the United States as localized data-bases may be accessed via a single 800-type number. In other embodiments, a centralized data base may be preferred and a telephonic identification code associated with the centralized data base may be utilized.)

Remote-site transceiver 740 may be positioned at any location permitting of two-way communication with fixed-site base-station 868. Global position system receiver circuitry portion 744 is operative to receive signals generated by satellites 706 and 712 and to

determine, responsive to such signals, positional information relating to the geographic positioning of transceiver 740. The positional information determined by circuitry portion 744 is provided to cellular transceiver circuitry portion 748.

When a user of transceiver 740 requests emergency assistance, a preselected, telephonic identification code, here an 800-number, is dialed which is associated with computer data base 908. Cellular transceiver circuitry portion 748 is operative in a manner analogous to operation of a conventional cellular radiotelephone to establish a telephonic, communication link with computer data base 908. Once a telephonic, communication link is established with computer data base 908, the positional information determined by circuitry portion 744 is provided to the computer data base.

Computer data base 908 is operative to access stored data contained in data bases 928 (or 932) associated with the geographic area at which remote-site transceiver 740 is positioned (as identified by the positional information determined by receiver circuitry portion 744 of the remote-site transceiver).

The data stored in data base 928 includes telephonic identification codes of emergency assistance facilities. When the positional information of the location of remote-site transceiver 740 is provided to computer data base 908, emergency data base 928 is accessed and the telephonic identification code of an emergency assistance facility most appropriate for the location at which remote-site transceiver 740 is located is determined. Control computer 920 provides such telephonic identification code to modem 916 which, in turn, transmits the telephonic identification code to the

telephonic network 892, telephonic network 892 provides the telephonic identification code to switching office 888 which, in turn, provides the telephonic identification code to fixed-site base-station 868 which, then, in turn, transmits the telephonic identification code to remote-site transceiver 740.

Once the user of the remote-site transceiver 740 obtains the telephonic identification code of the most-appropriate, emergency assistance facility, telephonic communication may be initiated with such emergency assistance facility in conventional manner. For purposes of example, the most-appropriate, emergency assistance facility may comprise emergency assistance facility 900. The user of the remote-site transceiver 740, upon receiving the telephonic identification code identifying emergency assistance facility 900, initiates telephonic communication therewith in conventional manner by way of cellular transceiver circuitry portion 748 of transceiver 740. Emergency assistance may thereafter be provided.

In a further embodiment of the present invention, circuitry, or algorithms, contained within remote-site transceiver 740 automatically initiates effectuation of a telephonic communication link with the emergency assistance facility associated with the telephonic identification code accessed by computer data base 908 and transmitted to transceiver 740 by way of base-station 868.

A user of remote-site transceiver 740 may also utilize the transceiver to obtain other information associated with the geographical area in which transceiver 740 is located. In a manner analogous to the manner in which the telephonic identification code of a most-appropriate, emergency assistance facility is

accessed by computer data base 908 and provided to remote-site transceiver 740 by way of base-station 868, telephonic identification codes associated with other facilities, such as commercial and other retail establishments, may be obtained. The telephonic communication link is again established with computer data base 908 by dialing the telephonic identification code, here again, an 800-number, associated with the computer data base. Positional information associated with the geographic positioning of remote-site transceiver 740 is again provided to computer data base 908 by way of fixed-site base-station 868, mobile telephone switching office 888, and local telephonic network 892.

When the positional information is received by control computer 920 of computer data base 908, stored data contained within non-emergency data base 932 is associated with the geographic area identified by the positional information is accessed. Telephonic identification codes comprising such stored information is provided to control computer 920 of computer data base 908 are provided to remote-site transceiver 740, again by way of telephonic network 892, switching office 888, and base-station 868. Thereafter, a user of remote-site transceiver 740 may initiate a telephonic communication link with a location associated with a telephonic identification code provided thereto.

Such non-emergency facility, for purposes of example, comprises non-emergency facility 906. A user of remote-site transceiver 740 initiates effectuation of a communication link with non-emergency facility 906 by transmitting a telephonic identification code associated with such non-emergency facility previously provided thereto by way of computer data base 908, in

conventional manner by transmitting the telephonic identification code to base-station 868. A communication link is effectuated between transceiver 740 and non-emergency facility 906 by way of base-station 868, switching office 888, and telephonic network 892. Again, non-emergency facility 906 includes apparatus, namely wireline telephone 1006, permitting normal, voice communication between transceiver 740 and the non-emergency facility 906 as well as transmission of data information including positional information provided to computer 1026 of non-emergency facility 906. Data stored within data base 1034 of non-emergency facility 906 may also be accessed, if desired.

Accordingly, the system of the present invention permits a user of a remote-site transceiver including a global positioning system receiver circuitry portion and a cellular transceiver circuitry portion to effectuate a communication link with a most-appropriate emergency assistance facility and also to obtain information, as well as to establish other telephonic, communication links with other facilities, associated with the geographic area in which the transceiver is located.

Finally turning now to the logical flow diagram of FIG. 5, the method steps of a method, referred to generally by reference numeral 1100, of a preferred embodiment of the present invention are listed. The method is for a remote-site transceiver including a radiotelephone operative in a cellular communication system having at least one fixed-site base-station as a portion thereof and a global position system receiver as another portion thereof. The method is operative to obtain data associated with a geographical area in which the remote-site transceiver is located.

First, and as indicated by block 1106, data at the fixed-site base-station associated with various geographic areas is stored.

Next, and as indicated by block 1112, communication signals are transmitted to the remote-site transceiver comprised of positional information permitting identification of geographic positioning of the remote-site transceiver.

Next, and as indicated by block 1118, the positional information, once received by the remote-site transceiver, is transmitted from the remote-site transceiver to the fixed-site base-station.

Next, and as indicated by block 1124, particular data associated with a geographical area identified by the positional information transmitted to the fixed-site base-station by the remote-site transceiver of the data stored at the fixed-site base-station is accessed.

Finally, and as indicated by block 1130, the particular data accessed is transmitted to the remote-site transceiver.

While the present invention has been described in connection with the preferred embodiments shown in the various figures, it is to be understood that other similar embodiments may be used and modifications and additions may be made to the described embodiments for performing the same function of the present invention without deviating therefrom. Therefore, the present invention should not be limited to any single embodiment, but rather construed in breadth and scope in accordance with the recitation of the appended claims.

Claims

What is claimed is:

1. A remote cellular radiotelephone, comprising:

a first receiver portion for receiving communication signals from a cellular radiotelephone base station;

a transmitter for transmitting communication signals to the cellular radiotelephone base station,

a second receiver portion for receiving communication signals comprised of positional information identifying the geographic positioning of the remote cellular radiotelephone, the second receiver portion coupled to the transmitter whereby the remote cellular radiotelephone is operative to transmit the positional information received thereat to the base station and the first receiver portion is operable to receive particular information from the cellular radiotelephone base station associated with the location information transmitted to the base station.

2. The radiotelephone of claim 1, further including a radiotelephone base station including a transceiver coupled to a memory storing particular information about a plurality of locations, and wherein the base station transmits the particular information stored in the memory and associated with the positional information received from the remote cellular radiotelephone to the remote cellular radiotelephone.

3. A communication system comprising:

at least one fixed-site transceiver having a fixed-site transmitter for transmitting communication signals therefrom and a fixed-site receiver for receiving communication signals transmitted thereto, and at least one remote-site transceiver having a remote-site transmitter for transmitting communication signals therefrom to the fixed-site receiver of the at least one fixed-site transceiver and having a remote-site receiver for receiving communication signals transmitted thereto by the transmitter of the at least one fixed-site transceiver;

a memory coupled to the fixed-site transceiver, the memory for storing data and accessed by the at least one fixed-site transmitter for communicating stored data to the at least one remote-site receiver; and

a remote-site receiver for receiving communication signals comprised of positional information identifying geographic positioning of the remote-site transceiver, wherein the remote-site transceiver is operative to transmit the positional information received thereat to the at least one fixed-site transceiver and the at least one fixed-site transceiver is operative, responsive to reception of the positional information transmitted thereto by the remote-site transceiver, to access particular data stored in the memory element, and to transmit the particular data accessed thereby to the remote-site transceiver.

4. The communication system of claim 1, wherein the at least one remote-site transceiver comprises, as a portion thereof, a global position system receiver.

5. The communication system of claim 1, wherein the at least one fixed-site transceiver is coupled to the memory through a wireline telephone network.

6. The communication system of claim 5, wherein the fixed-site transceiver comprises a cellular telephone system base-station.

7. The communication system of claim 1 wherein the radiotelephone further comprises a remote-site transceiver storage device coupled to the receiver portion of the radiotelephone and operative to store the particular data received by the receiver portion of the radiotelephone therein.

8. A method for operating a remote-site transceiver operatively coupled to at least one fixed-site base-station to obtain data associated with a geographical area in which the remote-site transceiver is located, the method comprising the steps of:

receiving in a remote site receiver positional information from a global position system;

transmitting the positional information received by the remote-site transceiver from the remote-site transceiver to the fixed-site base-station; and

receiving from the fixed-site transceiver particular information associated with the location of the remote-site transceiver identified by the positional information transmitted from the remote-site transceiver to the fixed-site base station.

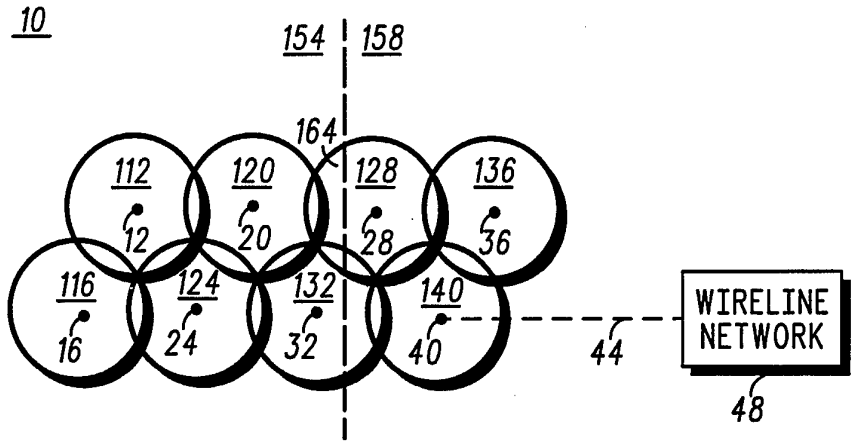
9. The method as defined in claim 8, further comprising the steps of :

storing data associated with various geographic areas in a memory coupled to the base-station;

accessing particular data in the memory associated with a geographical area identified by the positional information transmitted to the fixed-site base-station by the remote-site transceiver of the data stored at the fixed-site base-station during said step of storing responsive to reception thereat of the positional information transmitted by the remote-site transceiver;

transmitting the particular data accessed during said step of accessing from the fixed-site base-station to the remote-site transceiver.

10. The method of claim 9 wherein the data stored during said step of storing and comprises at least one telephonic identification code and said method further comprising the step of: attempting to form a communication link between the remote-site transceiver and apparatus associated with a telephonic identification code of the at least one telephonic identification code.


10
154
158
164
112
120
128
136
12
20
28
36
116
124
132
140
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32
40
44
WIRELINE NETWORK
48

FIG.1

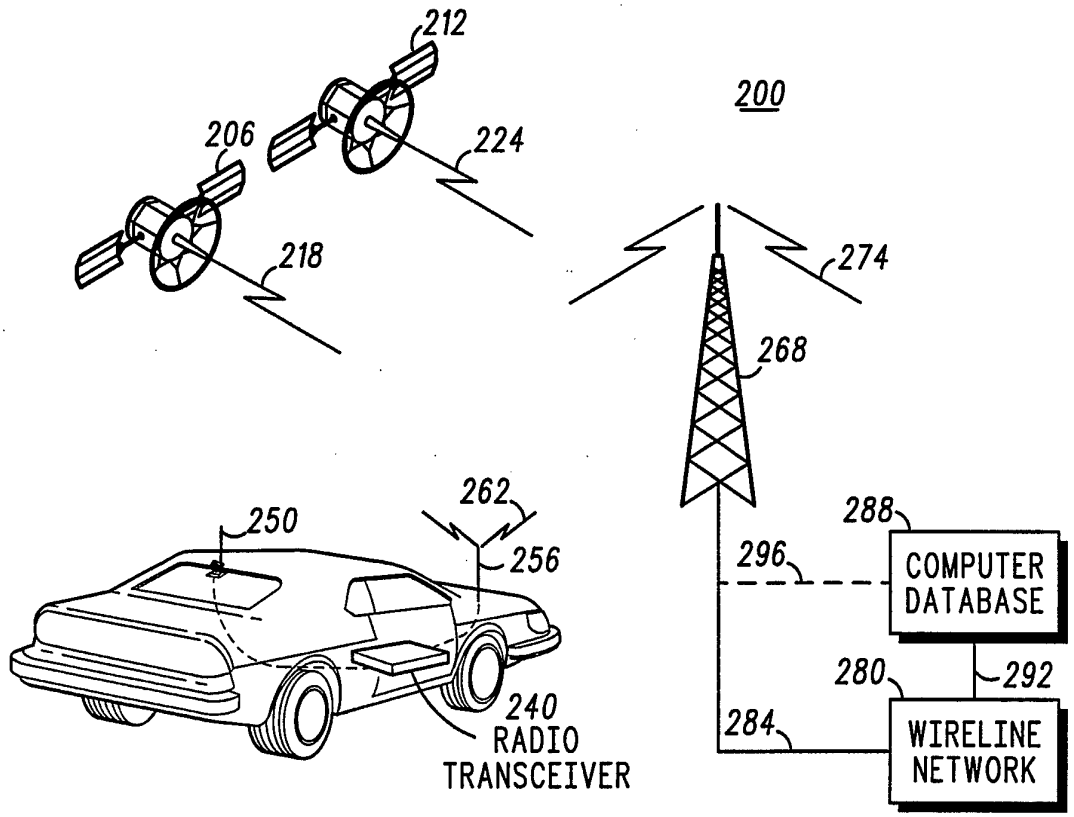
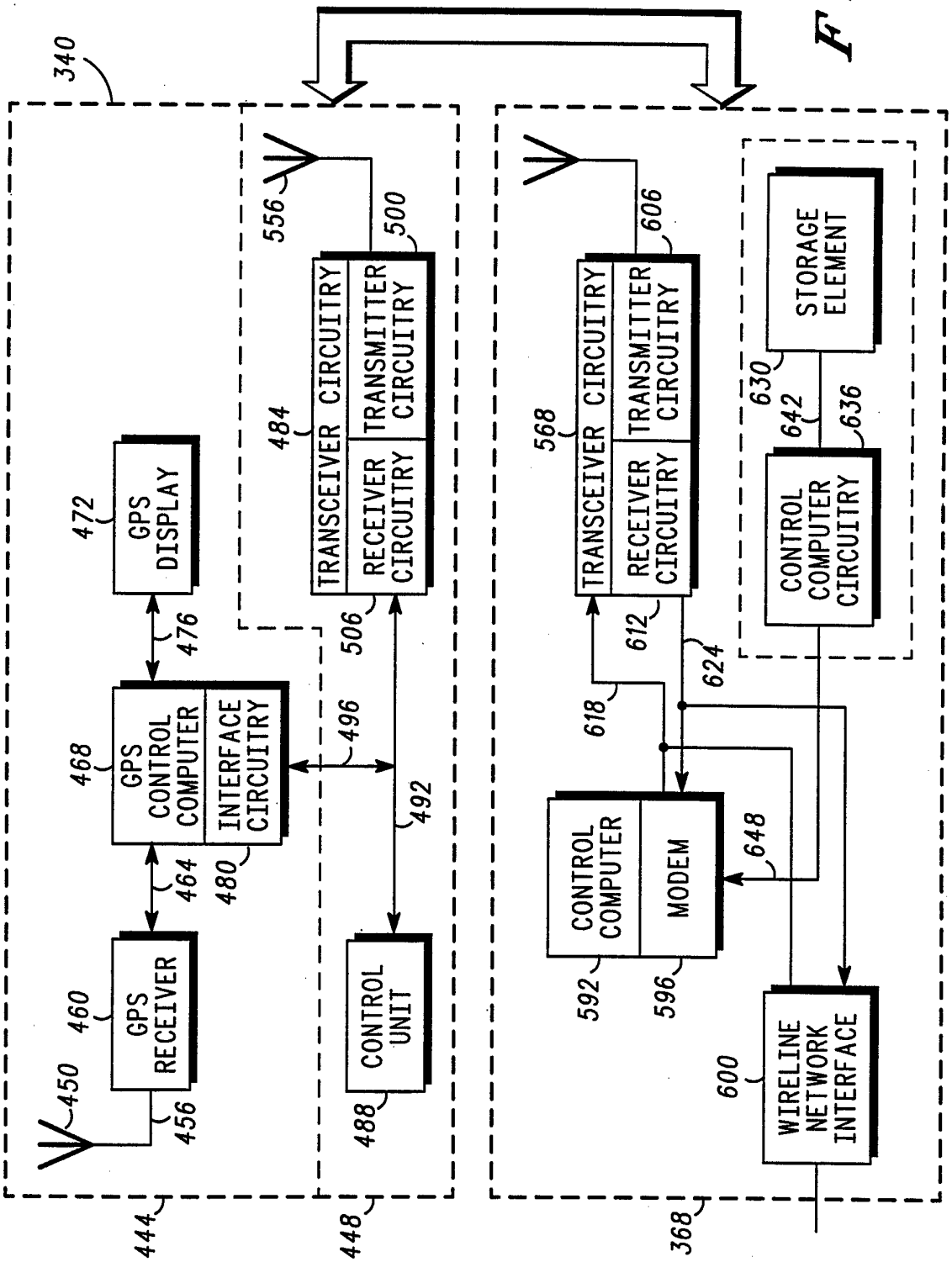

212
200
206
224
218
274
268
262
250
288
296
COMPUTER DATABASE
256
280
292
284
WIRELINE NETWORK
240
RADIO TRANSCEIVER

FIG.2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GPS DISPLAY
472
476
GPS CONTROL COMPUTER
INTERFACE CIRCUITRY
468
464
480
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444
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TRANSMITTER CIRCUITRY
RECEIVER CIRCUITRY
484
556
500
506
496
492
CONTROL UNIT
488
448
TRANSCEIVER CIRCUITRY
TRANSMITTER CIRCUITRY
RECEIVER CIRCUITRY
568
606
612
624
618
CONTROL COMPUTER
MODEM
592
596
648
STORAGE ELEMENT
630
642
636
CONTROL COMPUTER CIRCUITRY
WIRELINE NETWORK INTERFACE
600
368

FIG. 3

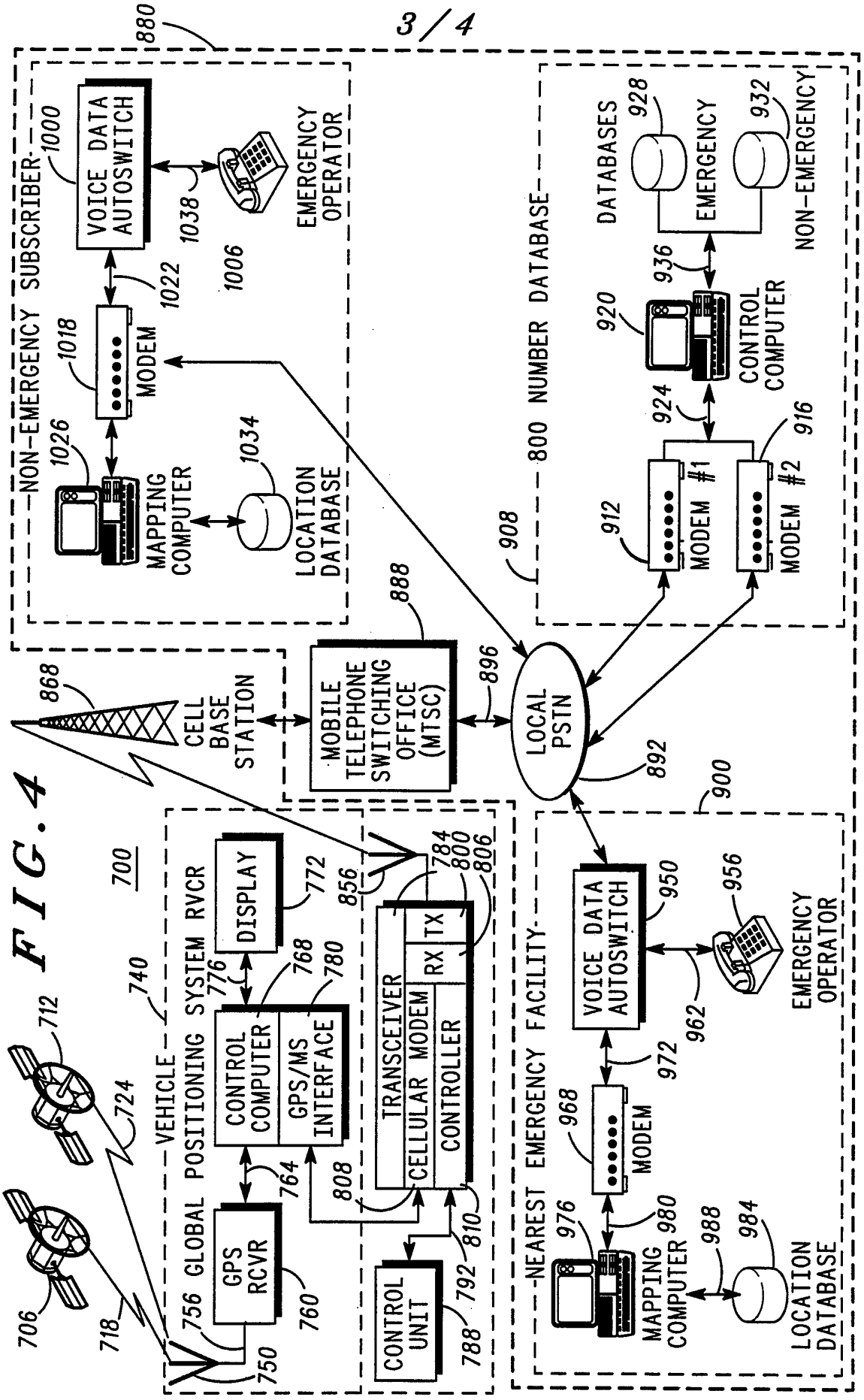
880
NON-EMERGENCY SUBSCRIBER
1000
VOICE DATA AUTOSWITCH
1038
EMERGENCY OPERATOR
1006
1022
1018
MODEM
1026
MAPPING COMPUTER
1034
LOCATION DATABASE
800 NUMBER DATABASE
928
DATABASES
932
EMERGENCY
NON-EMERGENCY
936
920
CONTROL COMPUTER
924
916
912
MODEM #1
MODEM #2
908
888
868
CELL BASE STATION
MOBILE TELEPHONE SWITCHING OFFICE (MTSC)
896
LOCAL PSTN
892
900
700
VEHICLE
740
GLOBAL POSITIONING SYSTEM RVCR
DISPLAY
772
776
768
780
CONTROL COMPUTER
GPS/MS INTERFACE
856
784
800
806
TRANSCEIVER
CELLULAR MODEM
TX
RX
CONTROLLER
712
724
706
718
764
808
810
GPS RCVR
760
756
750
CONTROL UNIT
792
788
NEAREST EMERGENCY FACILITY
950
VOICE DATA AUTOSWITCH
956
962
EMERGENCY OPERATOR
972
968
MODEM
976
980
MAPPING COMPUTER
988
984
LOCATION DATABASE

FIG. 4

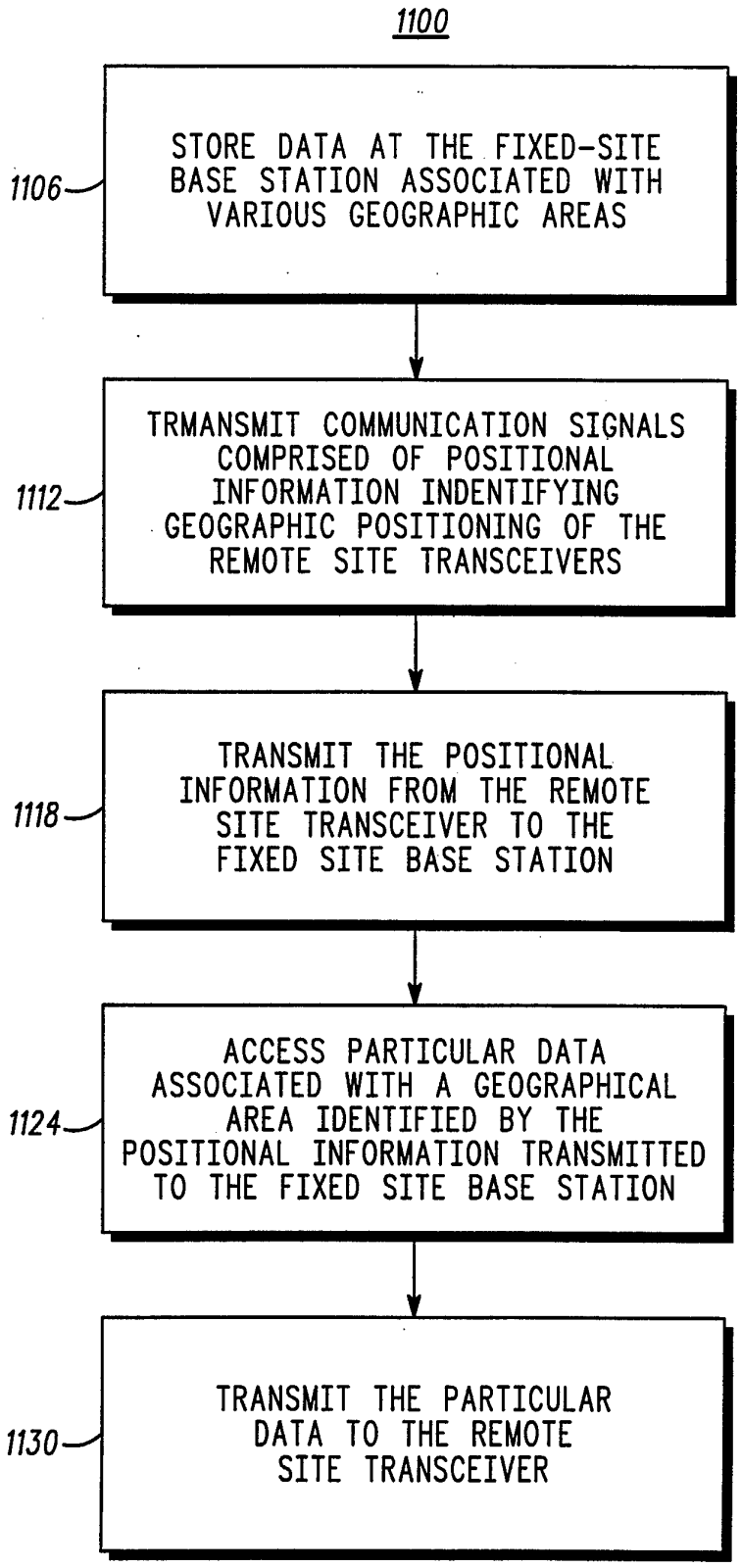
1100
1106
STORE DATA AT THE FIXED-SITE BASE STATION ASSOCIATED WITH VARIOUS GEOGRAPHIC AREAS
1112
TRMANSMIT COMMUNICATION SIGNALS COMPRISED OF POSITIONAL INFORMATION INDENTIFYING GEOGRAPHIC POSITIONING OF THE REMOTE SITE TRANSCEIVERS
1118
TRANSMIT THE POSITIONAL INFORMATION FROM THE REMOTE SITE TRANSCEIVER TO THE FIXED SITE BASE STATION
1124
ACCESS PARTICULAR DATA ASSOCIATED WITH A GEOGRAPHICAL AREA IDENTIFIED BY THE POSITIONAL INFORMATION TRANSMITTED TO THE FIXED SITE BASE STATION
1130
TRANSMIT THE PARTICULAR DATA TO THE REMOTE SITE TRANSCEIVER

FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/05721

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) :H04M 11/00
US CL :455/12.1,33.1,54.1, 56.1
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 455/12.1,13.1,33.1, 33.2, 34.1, 34.2,54.1,56.1; 379/59, 60

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US, A, 5,235,633 (DENNISON et al) 10 August 1993, col. 5, lines 19-56, figs. 7-8.	1-10
Y	US, A, 5,081,703 (LEE) 14 January 1992, col.2, lines 8-58, fig. 1.	1-10
Y	JP, A, 4-345,216 (TOKYO ELECTRIC POWER CO.) 01 December 1992, abstract, fig. 1.	1-10

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be part of particular relevance

"E" earlier document published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 AUGUST 1994	05 OCT 1994
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer THANH LE Telephone No. (703) 305-9646

Form PCT/ISA/210 (second sheet)(July 1992)★