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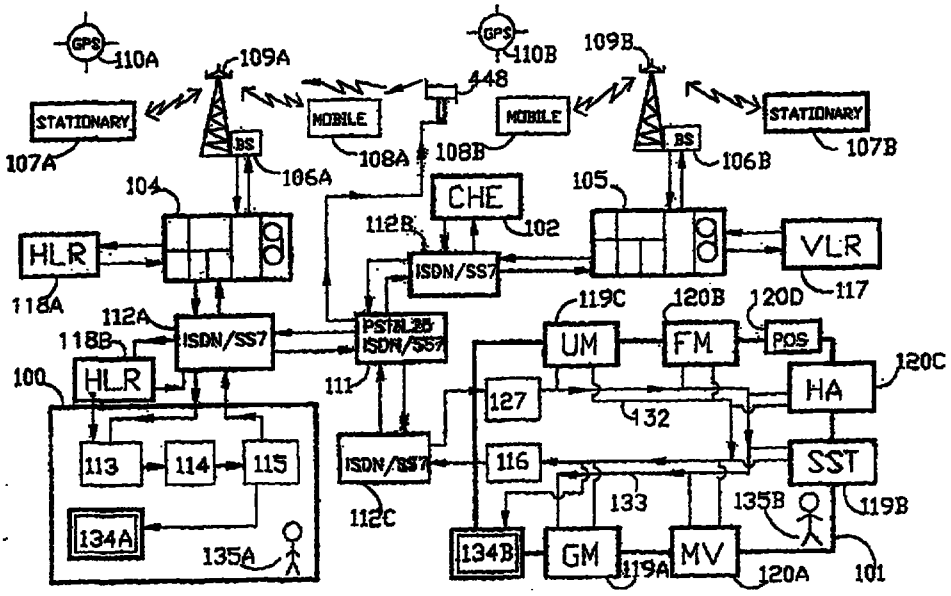
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(54) Title: WIRELESS APPLICATION SPECIFIC MESSAGING AND SWITCHING METHOD



(57) Abstract

A method for seamlessly transmitting application specific messages over existing wireless communication networks (448) on control channels, access channels, digital traffic channels, and switches comprising taking existing data (426) and manipulating the data (432) to create a manipulated data (228). Application specific messaging bits configured to appear as an origination data packet having from eight to thirty-two digit fields are transmitted over celular control channels (437). The manipulated data (228) is then translated (442) into an application specific message (438). The application specific message (438) is applied to control and communicate with an application specific apparatus (210), whereby wireless communication on the existing wireless communication network is provided without causing any disruption, system overload, or limitation on normal system communication activity.

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Description

Wireless Application Specific Messaging and Switching Method

Technical Field

The present invention relates to systems for transmitting and receiving two-way wireless data messages. More specifically, the invention relates to methods for data transfer through control channels, access channels, digital traffic channels, and switches of wireless communications systems.

Background Art

Systems and apparatuses have been proposed enabling wireless communication based on transmitted data rather than voice. Indeed, it has been suggested and speculated that we are in the midst of a revolution more realistically comparable in magnitude to personal computing than to cellular voice-based communications. But much less clear is the path this revolution may take. The expressed commitment of virtually all major providers of wireless communications for business subscribers to expanding services in data messaging practically ensures that wireless data messaging will grow rapidly in coming years. But the very diversity of the proponents of wireless data messaging suggests an industry that will be fragmented at best, or choked by dissent and destructive competition at worst. The foremost cause of such dissent and fragmentation is the lack of multi-system and inter-system data communication protocol uniformity and standardization. Another major problem is the staggering cost of upgrading existing Cellular Mobile Telephone (CMT) and Enhanced Specialized Mobile Radio (ESMR), infrastructure. If system uniformity is accomplished, the result could produce a seamless, worldwide data communications network. The network envisioned could provide application specific services such as two-way paging, motor vehicle fleet management, motor vehicle anti-theft and recovery, shipping container tracking, railroad system management, personnel tracking and location, home arrest, public utility system management, highway call box add-on services, remote traffic signal control, private and commercial building security system status reporting, anti-kidnapping, child protection, keep aways, point-of-sales, credit card verification, automatic teller, and a myriad of other application specific short packet data communication services. Further, these application specific systems can be location based by integrating Global Positioning System (GPS) receivers, and other location computing systems into the architecture of specially designed communication apparatuses.

Other location systems could be utilized and integrated into apparatuses which are directly applicable to the present invention's operational scheme. Such location apparatuses can be read from control channels, digital control channels, digital access channels, and application specific asynchronous and synchronous data messages that are sent within the operating protocol of digital traffic channels over cellular and PCS base stations to mobile communications, and instructed to perform certain positioning and location reporting tasks. Such tasks would be received from and transmitted back to said control channels. Other application specific service apparatus can be non-location in design and operation and provide direct communication of status, and a non-location apparatus can be instructed to perform certain tasks, over the respective control channels in use that are used in a particular starswitched communications system.

The system and apparatuses of the present invention provide a unique, simple and elegant solution to solving Cellular Mobile Telephone (CMT), Personal Communications Systems (PCS) and Enhanced Specialized Mobile Radio (ESMR) infrastructure upgrade and cellular inter-system compatibility problems, in terms of technical, logistical and operational issues which are significantly limiting the non-voice wireless data communications industry at present. The present invention also provides an economical and technically efficient means of delivering heretofore mentioned application specific services to the Enhanced Specialized Mobile Radio (ESMR) Industry (NEXTELL), the Motorola Integrated Radio System (MIRS), and other related systems. In fact, the method and apparatuses of the present invention provide the technical and logistical means of providing application specific services to any communications standard which operates on wireless networks or which depends upon a centralized control model, or operations based on centralized subscriber specific authentication, registration, and inter-system control data channel, and digital signalling architecture. In fact the present invention provides, for the first time, a system and apparatus which utilizes and exploits physical and logical control channel, digital traffic channel and digital access channel communication pathways for the purpose of directly sending and receiving data messages, and which directly communicates by radio link an entire Cellular Mobile Telephone (CMT) or Enhanced Mobile Radio (ESMR) network for the purpose of commercially operating heretofore mentioned applications for specific services that are directly controlled and communicated with on control channels that do not require any voice channel usage operations.

In fact, with the system and apparatus of the present invention, two-way data transmission can be fully accomplished without any voice channel set-up or access attempted. An entire one-way and two-way message communicative act can be

accomplished during the initialization and idle mode, as well as sending data bursts over Digital Traffic Channels and Digital Access Channels that take nano seconds to initialize and complete. This method can be added to existing Cellular Mobile Telephone (CMT), Enhanced Mobile Radio (ESMR), and Mobile Satellite (MS) system radio sets and entire networks. Control channel pathways and communications protocols have, up to the present time, been limited to registration, authentication, anti-fraud, internal system management roaming processes, voice encryption, and other related services, and in no way have been used to communicate application specific messaging directly to Cellular Mobile Telephone (CMT), Personal Communication Systems (PCS), and Enhanced Specialized Mobile Radio (ESMR) communicator apparatus, or to a communicator apparatus capable of sending application specific messages to control channels by direct radio link, without specialized modems. Such control channel data management presently involves many processes such as communicator apparatus control, which includes power control, voice quality control, and control and voice channel switching. Channel switching procedures are utilized for the purpose of maintaining the strongest signal on the strongest usable control channels, digital traffic channels, digital access channels, and voice channels, as well as other related processes.

Accordingly, it is a primary purpose of the present invention to provide a complete system and apparatus for the manipulation, translation, and encryption of control channel data bits such as Mobile Identification Numbers (MIN), which are the ten-digit thirty-two bit telephone directory numbers assigned to Cellular Mobile Telephone (CMT) and Enhanced Specialized Mobile Radio (ESMR) subscriber communication units. In addition, the present invention adds multi-bit application specific messaging to the control channels of said network systems. Additional control channel data bits the present invention manipulates, translates and encrypts are Shared Secret Data, A Key Data, Rand SSD data, Electronic Serial Number Data, Filler Data, Variable Length Digital Data Burst fields, Padded Data, Reserved Format Data, Additional Data, Digital Traffic Channel, Dialed Digit Fields, User Data, and a myriad of other control channel data now being utilized by analog and digital Cellular Mobile Telephone (CMT) and Enhanced Mobile Radio (ESMR) for subscriber registration, authentication, and internal system management. Furthermore, the present invention does not require prohibitively expensive Cellular Mobile Telephone (CMT) and Enhanced Mobile Radio (ESMR) infrastructure upgrades, or radio component add-ons for entire aforementioned networks.

The system and apparatus of present invention require no expensive subscriber-specific end user equipment; nor do they require specialized modems or other

cumbersome and expensive interface equipment. The present invention is fully digital but operates on existing analog cellular, digital cellular, digital PCS, enhanced specialized radio equipment, and satellite system apparatus. This feature of the present invention is important, simply because all data control channels in use in the world today are essentially digital. These control channels are routinely called Forward Analog Control Channels, Reverse Control Channels, or Digital Traffic Channels, which include Fast Associated Control Channels, Slow Associated Control Channels, Forward Digital Traffic Channels, Reverse Digital Traffic Channels, Primary Paging Channels, Secondary Control Channels, Secondary Paging Channels, Digital Access Channels, TDMA Data Burst Fields, Access Channel Capsules, and CDMA access channel data burst fields. Other cellular system control channels such as Enhanced Specialized Mobile Radio (ESMR) control and Digital Traffic channels, Motorola Integrated Radio system control channels and digital set-up channels, Code Division Multiple Access (CDMA) and other cellular telephone and radio systems rely upon control channels and digital access channels for internal system control and mobile station management.

It is also a purpose of the present invention to provide a system and apparatus which does not interfere with, or cause any disruption in conventional control channel processes which manage normal voice communications. The present invention is essentially transparent, regardless of what type of communications network system it is applied too.

It is a still further purpose of the present invention to provide a system and apparatus which does not interfere or disrupt normal control channel operations which were originally designed to support and manage voice communication processes only. That is, any control channel functions which are designed to manage the voice communications aspect of Cellular Mobile Telephone (CMT) or Enhanced Specialized Mobile Radio (ESMR) Mobile Satellite are not affected by the present invention's operations. In other words, all normal voice-based mobile subscriber stations operate unimpeded when the present invention is installed and applied to any given cellular telephone or radio network which relies upon a centralized control system as described.

There is further a great need in wireless communication technology for a low-cost data communications system and apparatus that efficiently and economically enables application specific services and apparatuses to be installed and utilized worldwide. The present invention provides, at a very low cost, an improved wireless communications-specific enabling system which overcomes the many shortcomings of prior messaging systems.

Furthermore, in order to fulfill the need to provide a wireless communication application specific enabling system to the Communications industry without requiring any mobile switching center (MSC) or base station or base transceiver station upgrades, add-ons or revisions, the present invention uniquely and elegantly utilizes the Remote Feature Access Control procedure. This procedure is utilized throughout the world, for example in Global System for Mobile (GSM), all broadband PCS standards, and in U.S. and international cellular systems that adhere to IS-41 revision (b) and revision (c). The present invention fully utilizes this feature in a completely novel and elegant manner. The unique usage and protocol procedure so established by the present invention creates a remote access application messaging (RAAM) protocol that further facilitates a seamless data packet routing protocol through any starswitched system that utilizes, for example, a home location register, a visitor location register, and the seamless interconnection protocols so specified in documents such as IS-41, ANSI Standards T1.110 through T1. 631, and European signalling standards so specified by European Telecommunications Standard technical committees (ETS). In one scenario, the RAAM feature is activated at the switch by the means of initializing a new class of service in the parameter tables. The parameter tables are constantly being updated through direct control by man-machine interface (MMI) terminals located at the mobile switching center (MSC), whereby new number classes such as the present invention's wireless communication application specific enabling system (WCASES) identity number (WIN). This WIN "looks" like a normal ten-digit mobile identification number (MIN). During the dialed digit analysis that is activated by the RAAM code, the WIN is analyzed. Once analyzed the switch determines that this WIN number is a roamer, then the entire WCASES packet is converted to IS-41-SS7 MAP protocol and sent to the Master Central Monitoring Station (MCMS) via the SS7 network. The WIN number cannot be used to place a voice call or receive a voice call from the landline telephone network. The WCASES communicators can use the RAAM feature by unique communicator and Master Central Monitoring Station (MCMS) software means that manipulates the data and converts the data into an application specific data. In that, standard dialed digits, which are conventionally used for placing mobile to land and mobile to mobile voice channel calls, are manipulated automatically to produce a unique application specific data that supports non-voice communications. Further, the MCMS decodes said manipulated data and derives application specific status data and relevant application specific meaning from the decoding means derived from analyzing the manipulated data contained within dialed digit fields, that "look" to the switch like conventional dialed digits transmitted over control channels, digital traffic channels, and digital access channels, but, in fact the data contained within the dialed digit fields is application specific status and command response data.

Additional objects and advantages of the invention will be set forth in the description which follows, and in part will be obvious from the description, or may be learned by practice of the invention. The objects and advantages of the invention may be realized and obtained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

Disclosure of the Invention

To achieve the foregoing objects, and in accordance with the purposes of the invention as embodied and broadly described herein, a method for seamlessly transmitting application specific messages over cellular radio system control channels and switches is provided, comprising in one embodiment, transmitting application specific messaging bits as a data packet configured to appear as an origination data packet having from eight- to thirty-two-digit fields containing data related to an application specific system utilizing control channel means and cellular switch remote feature control access request means. Transmitting the messaging bits over cellular control channels utilizing AMP, D-AMPS and TACS, FSK modulated reverse control channel RECC 10 Kbps 48-word BCH hamming coded control channel means, and applying the messaging bits to communicate with, identify, monitor, and locate the application specific system, thereby allowing for an integrated, application specific, two-way communications system.

In further accordance with the invention, there is also provided a method for wireless communication on existing wireless communication networks for manipulation, translation, and encryption of control channel, access channel, and digital traffic channel data bits, comprising: taking existing data and manipulating said existing data to create a manipulated data; translating said manipulated data into an application specific message; and applying said application specific message to control and communicate with an application specific apparatus, whereby wireless communication on said existing wireless communication network is provided without causing disruption, system overload, or limitation on normal system communication.

The method for wireless communication is preferably transmitted through a plurality of physical and logical control channels, digital traffic channels, and digital access channels as direct communications pathways for direct control of application specific communication apparatuses and application specific control and management apparatuses.

In accordance with the present invention, there is also provided an apparatus for

direct wireless communication on existing wireless communication networks, comprising: circuitry and software means for taking existing data and manipulating said existing data to create a manipulated data; means for translating said manipulated data into an application specific message; and means for applying said application specific message to control and communicate with an application specific apparatus, whereby wireless communication on said existing wireless communication network is provided without causing disruption , system overload, or limitation on normal system communication activity.

Accordingly, the present invention provides a wireless communications application specific enabling system (WCASES) technology, which provides an efficient and economical means for implementing such wireless data services in applications such as: motor vehicle fleet management, motor vehicle anti-theft locating and recovery, personnel management, interactive game data management, cable television data communications, shipping container tracking, railroad system management, point-of-sales, wireless gambling, personnel tracking and locating, home arrest, keep aways, child protection, anti-kidnapping system, outpatient management, remote drug and alcohol testing, diabetic monitoring, blood content, personnel identification, public utility system management, highway call box add-on services, remote traffic signal control, public utility system management, security system status reporting, offshore ship tracking and anti-piracy, robotic system control, medical alert, agricultural system management, vending machines, emergency 911, transmission line condition, roadway lighting status, industrial and motor vehicle emissions reporting, and many other application specific data communications, and system command and control services. The term application specific relates to applications which are data communication specific only, which relate to: Cellular Mobile Telephone (CMT), Enhanced Specialized Mobile Radio (ESMR), Personal Communications System (PCS), Global System For Mobile (GSM), Code Division Multiple Access (CDMA) PCS, DCT-1900, DCT-1800, DCT-900, JCT, Cordless Telephone PCS, CT2/CT2-plus, DECT, Personal Handy Phone System (PHS), asynchronous and synchronous data systems that operate within the logical protocol structure of cellular digital traffic channels, Satellite Cellular Hybrid (SCH) and Low Earth Orbit (LEO) systems called "brilliant pebbles systems," and Inmarsat satellite systems that can integrate and apply the present invention's method and apparatus, which will enable the communications systems to transmit messages to an apparatus which operates as a response to direct commands sent to the apparatus via cellular, PCS, satellite and or existing one-way broadcast paging networks, and the apparatus will perform directed tasks as a response to the commands from paging networks, cell broadcast, digital control channel

(DCCH), broadcast control channel (BCCH), and various satellite systems. The apparatus also sends data messages which relate to various parameters, conditions, and responses from systems and sensors, that the application specific apparatus is connected to or interfaced with. Preferably the control and direct communication activity will all occur on physical and logical control channels, digital access channels, and digital traffic channels that are integrated with Cellular Mobile Telephone (CMT), PCS, GSM, CDMA-PCS, Enhanced Mobile Radio (ESMR) and Satellite Cellular Hybrid (SCH) systems, and Low Earth Orbit (LEO) "brilliant pebbles," and Medium Earth Orbit (MEO) satellite systems which utilize physical and logical control channels, digital traffic channels, and digital access channels that are data specific only in terms of logical communications protocols, and where the contents of the messages are contained within radio frequency carrier wave and wave form. The methodology of the present invention does not interact in any way with logical channels and voice specific logical frames contained within digital traffic channels, and frequencies of the communication systems that act as voice communication specific logical channel pathways.

Additionally, the present invention fully utilizes the conventional remote feature access control procedure that is a standard for relaying dialed digit information to a co-located and remote home location register (HLR) that is a service control point (SCP) on SS7, X.25, and ISDN networks in the U.S. and around the world. The present invention creates a novel Remote Access Application Messaging protocol (RAAM) that further augments the operations scheme of the present invention. The present invention utilizes its own HLR type SCP data reception and processing message management system, in a unique application specific manner. In this way the present invention further takes conventionally formatted data that is manipulated data that contains application specific meaning received from a host SS7, or other public switched telephone (PSTN) signalling network, maintaining conventional standards and protocols, and decodes the data at the HLR-SCP point and manages the data in a unique and efficient manner. The decoded data is then relayed to application specific central monitoring stations (ASCMS), also known as service facilitators or bearers for further processing. The WCASES-RAAM feature is deployed in wireless systems without any need to add equipment or provide any costly software revisions to the host wireless provider. In fact, the entire system can be configured in a starswitched wireless network with minimal time and effort, establishing a wireless communication application specific enabling system (WCASES) that creates a control channel application data (CCAD) driven system. By utilizing specialized data-only WIN numbers and WCASES serial numbers (WSN), a new class of service is created without revising switch operating software, by simply adding a new number class to the MSC routing tables. Updating

MSC routing tables is a normal routine that requires no software patches or revisions.

Brief Description of Drawings

The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate a preferred embodiment of the invention and, together with a general description given above and the detailed description of the preferred embodiments given below, serve to explain the principles of the invention.

Fig. 1 is a block diagram of a preferred wireless communications specific enabling method, network, and apparatus according to the invention.

Fig. 2 shows a block diagram of a preferred wireless communications specific enabling method, network, and apparatus, according to the invention.

Fig. 3 is a flow chart illustrating the operation of transmittal of manipulated data and translated data into a wireless communications network, according to the invention.

Fig. 4 is a flow chart illustrating the method of receiving manipulated and translated data, and the processing of such data, according to the invention.

Fig. 5 is a flow chart illustrating the method of decoding the manipulated and translated data, according to the invention.

Fig. 6 is a schematic diagram of a bitmap illustrating the data space of the manipulated and translate data on a digital traffic channel, according to the invention.

Fig. 7 shows decoded data in a bitmap flow chart representing binary data traveling in a digital traffic channel, according to the invention.

Fig. 8 shows decoded data in a comparative data bas interpretation of manipulated and translated data as it is sent from a wireless network, according to the invention.

Fig. 9 is a logic flow chart of an Application Specific Integrated Circuit and Radio Frequency Circuit comprising the Communications Apparatus, according to the invention.

Fig. 10 is a logic flow chart of an Application Specific Load Control Apparatus, according to the invention.

Fig. 11 is a logic flow chart of an Application Specific Location and Security Apparatus for motor vehicles, according to the invention.

Fig. 12 is a logic flow chart of an Application Specific Video Game Unit, according to the present invention.

Fig. 13 is a flow chart of the Application Specific Video Game Unit score and status data as it circulates through a wireless communication system and a cable television system, according to the invention.

Fig. 14 is a block diagram of a wireless network control channel activity while the present invention is initiating an operations cycle within a routine control channel, according to the invention.

Fig. 15 is a block diagram of a wireless network control channel activity while the present invention is continuing the operations cycle within the routine control channels, according to the invention.

Fig. 16 is a block diagram of a wireless network control channel activity while the present invention is concluding an operations cycle within said routine control channels, according to the invention.

Fig. 17 is an illustration of Application Specific Command and instruction Data as it operates on a forward control channel and a forward digital traffic channel, according to the invention.

Fig. 18 is a block diagram of a preferred interaction of the Communications Apparatus with various Application Specific Apparatuses, according to the invention.

Fig. 19 is an illustration of the Master Central Monitoring Station interacting with various cellular and PCS networks, according to the invention.

Fig. 20 is an illustration of the present invention's location communicator with integral GPS antenna and receiver, according to the invention.

Best Mode for Carrying Out the Invention

Reference will now be made in detail to the present preferred embodiments of the invention as illustrated in the accompanying drawings. In describing the preferred embodiments and applications of the present invention, specific terminology is employed for the sake of clarity. However, the invention is not intended to be limited to the specific terminology so selected, and it is understood that each specific element includes all technical equivalents which operate in a similar manner to accomplish a similar purpose.

In accordance with the present invention, there is provided a method for seamlessly transmitting application specific messages over cellular radio system control channels and switches, comprising in one embodiment, transmitting application specific messaging bits as a data packet configured to appear as an origination data packet having from eight- to thirty-two-digit fields containing data related to an application specific system utilizing control channel means and cellular switch remote feature control access request means. Transmitting the messaging bits over cellular control channels utilizing AMP, D-AMPS and TACS, FSK modulated reverse control channel RECC 10 Kbps 48-word BCH hamming coded control channel means, and applying the messaging bits to communicate with, identify, monitor, and locate the application specific system, thereby allowing for an integrated application specific two-way communications system.

There is also disclosed a method for wireless communication on existing wireless communication networks for manipulation, translation, and encryption of control channel, access channel, and digital traffic channel data, comprising: taking existing data and manipulating said data to create a manipulated data; translating said manipulated data into an application specific message; and applying said application specific message to control and communicate with an application specific apparatus, whereby wireless communication on said existing wireless communication, and signalling networks is provided without causing disruption, system overload, or limitation on normal system communication activity.

An apparatus for direct wireless communication on an existing wireless communication network is also described, comprising: circuitry and software means for taking existing data and manipulating said existing data to create a manipulated data; means for translating said manipulated data into an application specific message; and means for applying said application specific message to control and communicate with an application specific apparatus, whereby wireless communication on said existing wireless communication network is provided without causing disruption, system overload, or limitation on normal system communication activity, thereby allowing data transmission without any interference or disruption with routine voice and related communications and control procedures of the wireless network.

In particular, the present invention's method, apparatus and communicating formats can be immediately implemented with existing Cellular Mobile Telephone (CMT) systems and Enhanced Specialized Mobile Radio (ESMR) systems. The general terminology that specify Cellular Mobile Telephone (CMT), Personal Communications Systems (PCS), and Enhanced Specialized Mobile Radio (ESMR), cover a wide range of mobile communications systems. The term Cellular Mobile Telephone (CMT) relates

to communications system which are specifically designated as; Cellular Mobile Telephone (CMT) systems, Satellite Cellular Hybrid (SCH) systems, which are currently called Iridium Systems, Teledisc Systems, and other mobile communication systems widely deemed cellular and satellite related. The term Enhanced Specialized Mobile Radio (ESMR) is a general term that relates to mobile communication systems which are controlled by a centralized switching and communicating scheme specifically designated as Enhanced Specialized Mobile Radio (ESMR) and generically known as NEXTELL, Global System for Mobile (GSM), Personal Communications Systems (PCS), CDMA PCS, TDMA PCS and Motorola Integrated Radio (MIRS).

The preferred method for wireless communication on existing wireless communication networks takes existing data and manipulates the data to create manipulated data. The data may be data providing readings of a remote monitoring device, for example, or data monitoring a game apparatus, traffic signal control apparatus, shipping container tracking apparatus, or the like. Preferably the manipulated data is transmitted through a plurality of physical and logically derived control channels, digital traffic channels, and digital access channels, as a direct communication pathways for direct control of an application specific communications apparatus, or application specific control and management apparatus, such as those discussed above.

The present invention is applicable, adaptable, and operable with all heretofore mentioned analog and digital Cellular Mobile Telephone (CMT) systems, Enhanced Specialized Mobile Radio (ESMR) systems, and other wireless communications system that depend upon electronic operations commonly described as centralized control, registration, authentication, anti-fraud, system management, intersystem communications, home location registers, and visitor location registers. These electronic process are important for system operational efficiency, flexibility, overall system security and user specific security. Such operational schemes traditionally include but are not limited to the following; electronic processes that perform registration routines, authentication routines, system control management, network-to-network communications, subscriber specific system-to-system roaming, anti-fraud procedures, and voice encryption. Other characteristics of aforementioned systems include internal system maintenance and system performance analysis, base station-to-base station hand-offs and hand-overs, home system to serving system handoffs and hand-overs, and other types of electronic data control channel related communications.

The present invention provides for application specific service implementation in single Metropolitan Subscriber Areas (MSA), Metropolitan Transaction Areas (MTA), and Rural Subscriber Areas (RSA), which cover various Geographical Service Areas

(GSA). For example, a subscriber area is controlled by a Master Central Monitoring Station (MCMS), which controls certain Application Specific Central Monitoring Stations (ASCMS). The MCMS and the ASCMS can be physically located in close proximity to one another, or physically located apart in various remote locations. The MCMS and the ASCMS can be linked by a wide variety of communications pathways and protocols, which send digital electronic data signals at different bit rates or speeds via PSTN network elements.

The MSA, in the United States, for example, are traditionally served by two cellular service providers, which are designated A side and B side. Normally, the A side service is provided by non-wireline carriers; that is, a service provider who has no affiliation with normal wireline telephone service providers. B side providers are normally affiliated with wireline providers. In many service areas the B side is owned and managed by a Regional Bell operating company, which operates land-line telephone services in that same geographical area, or Geographical Subscriber Area (GSA). Now there is a third service provider, called NEXTELL, which has been approved by the Federal Communications Commission to install and operate said third Enhanced Specialized Mobile Radio (ESMR) service. This third ESMR service is based upon an ESMR in Europe called Global System for Mobile (GSM). Such ESMR services are being installed and activated all over the U.S., and in other countries' National Subscriber Areas (NSA), along with other PCS operating platforms. In some cities there will be a fourth and fifth PCS carrier to compete with conventional cellular networks and ESMR networks.

The preferred embodiment of the present invention provides for national service implementation using the methodology and apparatus herein described. One Master Central Monitoring Station (MCMS) can manage, monitor, and control an entire Application Specific Network (ASN). Different Application Specific Central Monitoring Stations, (ASCMS) can be located in various metropolitan and rural subscriber areas, and operate various application specific services throughout existing Cellular Mobile Telephone (CMT) networks and Enhanced Specialized Mobile Radio networks (ESMR). These networks are presently linked by communications pathways. Such pathways also link Base Stations (BS) to Mobile Switching Centers (MSC). These communication links also physically connect other Cellular Mobile Telephone (CMT) and Enhanced Specialized Mobile Radio (ESMR) systems which operate with similar communications protocols. Protocols such as SS7, X.25, ISDN, C7 Red and Blue, ANSI, CCITT TCAP, and other such communication data management formats, provide inter-system control from transmission tower or Base Stations (BS) which are

strategically placed around a Geographical Service Area (GSA) and connected to a Mobile Switching Center (MSC) in order to serve and manage a particular Metropolitan Subscriber Area (MSA) or Rural Subscriber Area (RSA).

The inter-system and intrasystem data control and system management links can be provided by SS7, X.25, (PSTN), line-of-sight microwave links, links provided by geosynchronous orbit satellites, and other similar types of communications links. Region-to-region links can be provided by various satellite service providers. A region as applied here can be deemed a separate country or nation. Such satellite service providers as INMARSAT, COMSAT, and other U.S. and international satellite service providers can provide communications pathways to and from Global System for Mobile (GSM), which is a form of Enhanced Specialized Mobile Radio (ESMR) systems located throughout Europe. Other European cellular systems can be linked in this manner, and a Master Central Monitoring Station (MCMS) and an Application Specific Monitoring Station (ASMS) can be linked throughout the world by the combination of land links, microwave links, and satellite system links. Regional Master Central Monitoring Stations (RMCMS) act as communication system control hubs. These communication control hubs can manage Master Central Monitoring Stations (MCMS), which in turn manage Application Specific Central Monitoring Stations (ASCMS) throughout the world. The Regional Master Central Monitoring Stations (RMCMS) and Master Central Monitoring Stations (MCMS) are connected directly to the WCASES HLR which acts as a "home switch" in conjunction with a Master Central Monitoring Station (MCMS). The WCASES HLR/SCP acts as a home switch-central processing point of all other WCASES-compatible Mobile Switching Centers (MSC) confined within one Geographical Subscriber Area (GSA), a Metropolitan Subscriber Area (MSA), a Rural Subscriber Area (RSA), or an entire region or country. The WCASES HLR/SCP is physically connected to other Mobile Switching Centers (MSC) via electronic digital SS7, X.25, ISDN and other standard PSTN communication links. Such communication links act as pathways whereby different communication protocols carry various forms of electronic data. A Regional Master Central Monitoring Station (RMCMS) and/or Master Central Monitoring Station (MCMS) can be connected to the Roamer Port (RP) or Signalling SS7 Port (SP) of that particular switch, which provides physical access to electronic data roamer information. The roamer information can be utilized to manage and control Application Specific Subscriber Apparatuses (ASSA). The present invention manipulates, translates, and encrypts this data. Such data contained in the Mobile Identification Numbers (MIN) and Shared Secret Data (SSD), A-key data, User Data (UD), and other related data is utilized in the preferred embodiment of the invention in a novel manner, thus adding an entirely new and

innovative means of providing additional subscriber specific and application specific services to existing Cellular Mobile Telephone (CMT) networks, Enhanced Specialized Mobile Radio (ESMR) networks, and Personal Communication System (PCS) networks.

Application of the present preferred method and apparatus is not confined to utilizing HLR/SCP Roamer Data Base (RDB) data, which is another way of describing roamer parameter ten-digit MIN and WIN tables, and new classes of service. The Regional Master Central Monitoring Station (RMCMS) and the Master Central Monitoring Station (MCMS) can be connected to other data control signalling interfaces physically located and interfaced with the Mobile Switching Center (MSC), the Base Station (BS), and other signalling pathways which connect to Roamer Data Bases (RDB) and other types of Mobile Cellular and Enhanced Mobile Radio (ESMR) systems. When a particular Metropolitan Subscriber Area (MSA) or Rural Subscriber Area (RSA) is interfaced to the aforementioned application specific services, such services can be confined to that particular home system, and thereby do not have to operate from a Roamer Data base (RDB), confined to a local area network (LAN) via T1/DSO or 56kbps or 128kbps frame relay data. Local registration, authentication, and system management control data communications pathways can be interfaced to a single Central Monitoring Station (CMS), and confine said services to one Metropolitan Service Area (MSA) or one Rural Subscriber Area (RSA), with one WCASES HLR/SCP (HS) in the described aforementioned manner. Said Geographical Subscriber Areas (GSA) may utilize a Cellular Mobile Telephone (CMT) system, a Enhanced Specialized Mobile Radio (ESMR) system, a Personal Communications System (PCS), or a Global System for Mobile (GSM) communications system without necessarily communicating said application specific information to other Enhanced Specialized Mobile Radio (ESMR) and Cellular Mobile Telephone (CMT) systems that operate outside of said Geographical Subscriber Area (GSA).

The present preferred embodiment of the invention enables increased capacity on voice traffic pathways that are physically and logically defined. The present invention utilizes control channels, digital traffic channel, digital control channels, digital access channels, and other data-only mediums that are physically and logically defined. One of the drawbacks of current Cellular Mobile Telephone systems (CMT) and Enhanced Specialized Mobile Radio (ESMR) systems is the limit to the number of channels available for use, which causes frequent system overload. This load limit is a technological limitation of current systems, and is also related to current government regulation, for the Federal Communications Commission allocates only so many

frequencies and channel slots for system use. The present invention communicates in short, high-speed data bursts over the control channels, digital traffic, and digital access channels, and will in no way create traffic overload on the overall system architecture, system load capacity, infrastructure, and normal voice-based call processing operations.

Preferably, a Regional Central Monitoring Station (RCMS) is provided which manages and controls an entire country or National Service Area (NSA), or a particular region of a given National Service Area (NSA). This is accomplished by interfacing with a National Service Areas (NSA) established Cellular Mobile Telephone (CMT), Enhanced Specialized Mobile Radio (ESMR), Personal Communications System (PCS), or Global System for Mobile (GSM) network. Such systems are typically interconnected to a Roamer Data Base (RDB), that is typically interfaced with an SS7 or X.25 network. These types of networks are provided by the North American Cellular Network (NACN) and Mobilelink, as well as any other enclosed or open interconnected signalling system. In another embodiment the present invention's operating system can be linked by cooperating subscriber and Roamer Data Bases (RDB). A Roamer Data Base (RDB) is part of the SS7 IS-41 control management operational scheme, and it is a communications system in which Cellular Mobile Telephone (CMT), Global System for Mobile (GSM), TDMA PCS, CDMA PCS, and Enhanced Specialized Mobile Radio (ESMR) systems are linked by the aforementioned communications pathways and protocols. The present invention's MCMS HLR/SCP acts as an independent Roamer Data Base (RDB) for WCASES communicator users, that communicate directly with a plurality of Mobile Switching Centers (MSC) which are located throughout a country, city, or other Geographical Service Area (GSA). Such Mobile Switching Centers (MSC) control and manage a multitude of transmission tower Base Stations (BS) which directly serve Application Specific Subscriber Apparatus (ASSA).

Subscriber information, such as subscriber identification, mobile unit Electronic Serial Numbers (ESN), Mobile Identification Numbers (MIN), Shared Secret Data (SSD), A-Key Data, CAVE algorithm, Rand Shared Secret Data, Dialed Numbers, Personal Identification Numbers (PIN), User Data (UD), Filler Data (FD), Reserved Formats (RF), Additional Data (AD), and other subscriber mobile unit apparatus specific information is stored and managed at the Mobile Switching centers (MSC). These Mobile Switching Centers (MSC) contain data bases herein termed Home Location Registers (HLR) and Visitor Location registers (VLR). The Roamer Data Bases (RDB) and the present invention's HLR service control point are linked by the aforementioned communications pathways and protocols to the Home Location Registers (HLR) and Visitor Location Registers (VLR). The Home Location Registers

(HLR) and Visitor Location Registers (VLR) contain aforementioned subscriber specific information. For example, when a typical cellular subscriber visits or roams in a service area that he has not subscribed to as his home service system, intrasystem communication pathways provide subscriber specific data base updates. Typically, the present invention's WCASES communicators will almost always be configured as a roaming mobile, or stationary communicator designated as a roamer, for switch management purposes. If a user who subscribes to a PCS or a Cellular Mobile Telephone (CMT) service provider in New York, for example, visits or roams in a PCS-serving system in Miami, Florida, the system electronically checks the roaming subscriber's service record at the originator home system provider's subscriber specific data base through the aforementioned intrasystem communications pathways. This is accomplished by means, preferably a program operably linked to the Enhanced Mobile Radio (ESMR), and Cellular Mobile Telephone (CMT) communications apparatus using a code termed a System Identification Designation (SID) number. A System Designation Number (SID) is assigned to each Metropolitan Subscriber Area (MSA) and Rural Subscriber Area (RSA) by the Federal Communications Commission, and each mobile subscriber unit is electronically programmed with such particular System Identification Number (SID). When a subscriber places a call, or transmits application specific data, to the Enhanced Mobile Radio (ESMR) and or Mobile Telephone (MT) service provider, the provider utilizes the System Identification Designation (SID) number as a means by which the visiting subscribers home system is identified. Thus, the identification of said home system provider is revealed, and the home system provider is then accessed, so as to properly identify which system a particular subscriber is assigned to. Once this is accomplished, the cellular subscriber is electronically assigned a temporary roamer number and allowed to make calls and receive calls in that particular service area while his presence is detected. A preferred embodiment of the present invention operates similarly, except the user sends and receives an encrypted control channel data packet, digital control channel (DCCH), broadcast control channel (BCCH), synchronous and asynchronous short messaging packets on digital traffic channels, and digital access channel data packets which act as an additional but transparent communications system which can be implemented and integrated with various Cellular Mobile Telephone (CMT) and all other PCS and satellite network systems.

Another means of identifying a Cellular Mobile Telephone (CMT) and Mobile Radio (MR) subscriber's home system, for example, is by electronically examining the first three digits of the Mobile Identification Number (MIN). This number is a normal area code number, such as 408, 310, 415, which is part of a normal 10-digit telephone directory number . This number is also called the Number Plan Area number (NPA).

Each operating home Cellular Mobile Telephone (CMT) system, Enhanced Specialized Mobile Radio (ESMR) system, Personal Communications System (PCS), or other centrally controlled communications system which interacts with land based, hard-wired telephone networks is assigned a three-digit NPA area code number. The present invention utilizes a special data-only NPA such as 175 that will not be used for voice calls initiated by a landline query. This number causes the present invention's remote access application message (RAAM) service class to be recognized by the serving MSC. Other data indicators contained within the present invention's data packet cause the RAAM to be activated and the RAAM procedure to be completed.

The method and apparatus of the present invention allow for point-to-process and process-to-point communications capabilities, that is; sending commands or manipulated data from a centralized monitoring and control center to an application specific communicator apparatus, thereby providing individual commands to individual subscribers. Transmitting status reports from the specific communicator apparatus back to a centralized monitoring and control center is also possible . Additionally, the present invention provides for digital data dispatch commands to be sent to groups of application specific communicator apparatuses, preferably in the form of widely dispersed messages transmitted to each individual Application Specific Communicator Apparatus (ASCA) by a Command System (CS) that determines which transmission path is appropriate for a particular serving system configuration. The transmission path for command and instructions can be sent via an analog or digital forward control channel, one-way paging network, a particular satellite network, the digital control channel (DCCH) of a cellular system that utilizes IS-54B/136 TDMA, or IS-95 CDMA, or GSM TDMA logical and physical control and digital traffic channels. These downlink or forward messaging pathways can send individual codes to each communicator apparatus which are part of larger application specific service groups. Prior Cellular Mobile Telephone (CMT) systems have been incapable of sending blanket dispatch user specific communication messages in this manner. Such status reports encompass but are not limited to location and positioning information that relates to Global Positioning System (GPS) vectoring, triangulation, contact closure and opening information that relates to security status information in homes, business and motor vehicle anti-theft systems. Such encrypted data messages created by the present invention also provide velocity and direction information, power-on and power-off commands and information, information that relates to managing public utility information, automatic utility meter reading, timer-on and timer-off control for traffic signalling equipment, and a host of other application specific processes. The apparatus can be sent commands from different central monitoring stations to direct the performance of desired functions,

such as turn on and turn off, reset, send update location information, go to next designated location, and many others.

Using the method and apparatus of the present invention, an enormous amount of data can be transmitted and received over the different control channel systems utilized by many different radio communication subscriber based systems such as Cellular Mobile Telephone (CMT), satellite and Enhanced Specialized Mobile Radio (ESMR), and the preferred method and apparatus of the invention can be utilized by Personal Communication Systems (PCS) data control communications pathways, resulting in a truly immense number of applications. The efficiency and simplicity of the preferred method and apparatus of the present invention is evident. Most importantly, the present invention can be implemented and placed into operation without Enhanced Mobile Radio (ESMR) and Cellular Mobile Telephone (CMT) system infrastructure upgrades, and when the present invention is implemented, it will not cause disruption or system overload once in full operation.

The preferred method and apparatus of the present invention allows for an application specific communications apparatus to receive an application specific message for control of and communication with the application specific apparatus; for example, location and non-location data of specific service apparatuses. The location and non-location application specific communications apparatus is preferably configured and manufactured for data communications and control operations. Such operations as location specific motor vehicle tracking, motor vehicle anti-theft and recovery, shipping container tracking, personnel tracking, and other location-based data communications services can be provided by configuring the location Cellular Mobile Telephone (CMT), GSM, PCS and Enhanced Mobile Radio (ESMR) communications apparatus in accordance with the hereinafter described specific nomenclature and design parameters to accomplish electronically the application specific communications and control processes as described.

Stationary communicator apparatus means which are non location specific include utility management and control, roadside call box add-on services, remote traffic signal control, security system status reporting, and other related services, can be designed and implemented to provide application specific communications and application specific control processes. The present invention may also provide for a hybrid location and non-location method and apparatus for control and management of recreational game information. For example, video games such as Sega Games, Nintendo, and wireless casino gambling terminals can be configured to send data such as game scores and other game related data over aforementioned control channel and digital traffic channels to a

Central Monitoring Station (CMS) which is interfaced with the Application Specific Central Monitoring (ASCM), which in turn is interfaced with a cable television operations head end and control system. This cable television head end sends game information over a dedicated cable channel that serves these video game players. The channel acts as a video bulletin board and displays game scores and other data. These channels and scores can be regionalized; that is, scores can be received by all of the game players nationally or by one group or one person playing a video game in his home and competing with other game players next door or across the country. The game player's module will contain the present invention's application specific circuitry which manipulates, translates, and encrypts control channel data and digital traffic channel data, and transmits this data into aforementioned Cellular Mobile Telephone (CMT), Enhanced Specialized Mobile Radio (ESMR), GSM, PCS, and Satellite Hybrid (SCH) systems. This data is preferably relayed via a plurality of transmission towers, base stations, mobile switching centers, and onto central monitoring stations, and finally to cable television system head ends which provide an electronic bulletin board system which is transmitted to the game users watching the cable system game channels. Game information is preferably transmitted periodically from individual game user modules into the aforementioned networks in order not to cause any control channel or digital traffic channel overload. Alternatively, this information can be downloaded at night or early in the morning, once or twice during a twenty-four hour period. There are many variations of this interactive game system that can be implemented by utilizing the present invention's method and apparatus. This same approach can be utilized from smaller local area wireless networks contained within gambling casinos, whereas the video display can be a television set or a video display in a gaming terminal. The gaming terminal can operate within a building, and when it no longer detects the carrier wave of the in-building network and detects the cellular system carrier wave, it can automatically switch to the cellular system, and act as a true dual-mode gaming terminal. The casino has a wireless gaming application specific central monitoring station that is connected to the central monitoring of the present invention via the PSTN.

The application specific communicator apparatus preferably contains within specially designed circuitry means by which it may add additional data, manipulate, translate, encrypt, transmit, and receive data such as Mobile Identification Numbers (MIN), WCASES identification numbers, dialed digits, autonomous registration packets, new class of service packets, and other packets created by the present invention. Such circuitry means take Normal Mobile Identification Numbers (NMIN) and create Modified Mobile Identification Numbers (MMIN), such as the WCASES identification numbers. The Modified Mobile Identification Numbers (MMIN) are

utilized to send and receive encrypted messages to and from the central monitoring systems that retrieve and transmit said Modified Mobile Identification Numbers (MMIN) through Cellular Mobile Telephone (CMT) systems, Enhanced Mobile Radio (ESMR) systems, and Personal Communications Systems (PCS) in a transparent manner. The term transparent, as used herein, describes the operational condition of the present invention which does not overload, disrupt, or cause any operational problems with normal Cellular Mobile Telephone (CMT) and Enhanced Mobile Radio (ESMR) voice-based communications operations, especially in terms of traditional control channel, digital access, digital control channel (DCCH), and digital traffic channel operations. The present invention effectively utilizes dialed digit data fields to transmit data-only non-voice communication packets in many of its applications.

The application specific communicator apparatus preferably contains a specially designed circuitry means by which it manipulates, translates, encrypts, transmits and receives control channel data such as dialed digits, in addition to creating Modified Mobile Identification Numbers (MMIN). Such data and process called Shared Secret Data (SSD) can be modified and encrypted. The circuitry means takes Normal Shared Secret Data (NSSD) and creates Modified Shared Secret Data (MSSD). The Modified Shared Secret Data is utilized to send encrypted data messages to central monitoring data terminals in the same way Normal Mobile Identification Numbers (NMIN) are modified, manipulated, translated and encrypted by the present invention's electronic processes and design. Other data such as User Data (UD), Filler Data (FD), Reserved Formats (RF), and Additional Data (AD) can also manipulated in the same manner. The application specific communicator apparatus further contains specially designed circuitry means which correlate and add additional data bits which carry GPS coordinates, security status, electrical load control status, and other application specific status and command control information. This same specialized circuitry also performs manipulation, translation, encryption, and transmission tasks of GPS information. The Central Monitoring Stations (CMS) contain data management and control systems means which receive the encrypted data from Cellular Mobile Telephone (CMT), GSM, PCS, and Enhanced Specialized Mobile Radio (ESMR) networks' Mobile Switching Center (MSC) signal processing systems. This data preferably originates from the Application Specific Communicator Apparatus (ASCA), where it is processed, evaluated, and electronically acts upon its received command data meaning. Then Central Monitoring Stations (CMS) data management and command data terminals send encrypted command data from the central monitoring station, over the heretofore mentioned transmission mediums, which further relays the manipulated, translated, and encrypted data to the Application Specific Communicator Apparatus (ASCA). The

ASCA receives the application specific command data and acts electronically according to the application specific electronic processing and interpretation of said command data. Other control channel and digital access channel specific data such as A Key data, CAVE Algorithm, RAND Shared Secret Data, Dialed numbers, User Data, Filler Data, Reserved Formats and personal identification numbers (PIN) can be manipulated, translated, and encrypted in order to send and receive data message instructions to the application specific communicator apparatus, and such data can also be transmitted from the same apparatus. These processes are all accomplished without creating any sort of overall system disruption, overload, or violating any governing operational and signalling standards by which said encrypted data is received from, and transmitted to said central monitoring station data management and control terminals. Preferably, all of the control data is transmitted by the Application Specific Communicator Apparatus (ASCA) to the Central Monitoring Station (CMS) by way of Cellular Mobile Telephone (CMT), PCS, GSM and Enhanced Specialized Mobile Radio (ESMR) network control channel data processing and transmission systems; received, processed, relayed, and in turn transmitted back to the Application Specific Communicator Apparatus (ASCA) by a technically and logistically participating Cellular Mobile Telephone (CMT) network system, and Mobile Radio (MR) systems, which include but are not limited to: Cellular Mobile Telephone (CMT), Enhanced Specialized Mobile Radio (ESMR), Motorola Integrated Radio System (MIRS), Personal Communications System (PCS), Satellite Cellular Hybrid systems (SCH) or by any other Cellular Mobile Telephone (CMT) or Enhanced Specialized Mobile Radio (ESMR) system which depends upon a central data management scheme in which the process of subscriber registration, authentication, internal system data management, system maintenance, anti-fraud management, and other intrasystem data management processes and control communications. The overall system and data management schemes are preferably transmitted on control channels. Other processes, such as managing roamer data bases, or managing any multi-system data management protocol which encompasses related remote processes such as registration, authentication, data management, call processing, and other processes commonly considered and designated as control channel data communications, digital control channel communications, digital access channel and digital traffic channel communications, may also be utilized and applied with the present method and apparatus.

According to another aspect of the invention, there is provided a group of central monitoring, Wireless Communications Application Specific Enabling System (WCASES), data retrieval, data decoding, data distribution, data storage, and command data control method and apparatus. The Data Reception and Distribution terminal

(DRD), data Decoder terminal (DEC), Comparative Data Base terminal (CDB), and Command Data Control terminal (Command Data Control), and other interface and communications components preferably comprise the central components of a WCASES Central Monitoring Station (CMS). Further, such nomenclature as Regional Data Reception and Distribution terminal (RDRD), Regional Decoder terminal (RD), Regional Comparative Data Base (RCDB), and Regional Command Data Control terminal (RCDC), Master Data Reception and Distribution terminal (MDRD), Master Decoder Terminal (MDRD), and Master Command Data Control terminal (MCDC), Application Specific Data Reception and Distribution terminal (ASDRD), Application Specific Decoder terminal (ASD), and Application Specific Command Data Control terminal (ASCDC) all are designated as data retrieval, distribution, storage, and command systems which encompass and comprise the present invention's Central Monitoring System (CMS).

In another embodiment, the invention allows for the modification of Cellular Mobile Telephone (CMT), Enhanced Mobile Radio (ESMR), Personal Communications System (PCS) processing switch parameter table software located electronically within processing switches in the Mobile Switching Centers (MSC). Preferably contained within all processing switches is software allowing for specific management of the electronic processes of registration, authentication, anti-fraud processes, remote feature access control and additional call feature and data processing. Key processing switches located within a Mobile Switching Center (MSC) are connected and operational with the present invention method and apparatus and may also be used with small registration software and processing modifications or patches. These processing switch software modifications do not disrupt, alter, or violate the operational integrity or system security of the Cellular Mobile Telephone (CMT), GSM, PCS and Enhanced Specialized Mobile Radio (ESMR). The CMT and ESMR preferably include, but are not limited to, Cellular Mobile Telephone (CMT), Enhanced Specialized Mobile Radio (ESMR) systems, Personal Communications Systems (PCS), Global System for Mobile (GSM) network systems, or any other communications system. This aspect is critical to successful system operations and system security. The only feature that is modified in the processing switch software is the feature that handles remote feature access control, possibly the registration, authentication, and processes that affect the present invention's operational scheme. This is all dependent upon cellular carrier preferences.

The present methodology provides a multi-featured wireless communications application specific enabling system which includes means for reading, analyzing, controlling, and communicating through various wireless communication networks and

the signalling, control channels, digital access channels, and through the digital traffic channels that operate within these networks. Preferred networks which may be utilized include Cellular Mobile Telephone (CMT), Enhanced Specialized Mobile Radio (ESMR) NEXTELL, Specialized Mobile (GSM), Personal Communications System (PCS), and Satellite Cellular Hybrid (SCH) system. Additionally, any wireless communications system that depends upon centralized control via data control channels and digital traffic channels for the purposes of user registration, billing, internal system maintenance, internal system security, sending user information, call forwarding, and other related operations is immediately usable by the present invention's apparatus and methodology. Further, any wireless communications system which utilizes separate data control channels, digital access channels, and digital traffic channels that are physically and/or logically defined for such aforesaid operations can be utilized and adapted for the present invention's application specific communications, operations, and application specific communications apparatus.

The invention includes means for remote monitoring and calculation of a motor vehicle's, person's, or other moveable object's position and direction, and detection of local status events, and like, and calculation of a system response based on a plurality of weighted variables. From such calculated response, the system notifies the user of various status parameters of the object or person being monitored. In certain circumstances, the system may be used to notify an application specific central monitoring station via paging networks, satellite networks, and two-way data control channels, digital access channels, data burst fields DCCH, and other digital traffic channels to allow the central monitoring station to respond appropriately to various situations such as summoning emergency vehicles, police, private security personnel, medical personnel, and other such emergency response services. Provision of a two-way control data channel and digital traffic channel communications system also allows the Central Monitoring Station to positively verify the message which was sent by the motor vehicle, person, or moveable object being monitored or located.

The preferred embodiment of the apparatus for direct wireless communication on an existing wireless communication network presently includes a plurality of computer displays and computerized graphic maps which display the relative position and status of an object or person being monitored, such as a motor vehicle, person or moveable object, derived from Global Positioning System (GPS), or other vectoring, triangulating, and other relative position computing system. Other methods of establishing a location can garnered by user input or by other automatic sensors and location systems, thereby providing a highly accurate real-time tracking and status

communication enabling system.

The preferred apparatus for direct wireless communication also includes an integrated location system, a communication network via data control channels, and a plurality of digital traffic channel mapping systems operably coupled to status response systems, and application specific dispatch capability via a Master Central Monitoring Station (MCMS), and an Application Specific Central Monitoring Station (ASCMS). The location aspect of the present invention is especially suitable for use in fleet vehicle management, vehicle theft deterrent, stolen vehicle tracking, railroad car tracking, cargo location, and so forth. The apparatus, when applied with the method of the present invention, may be customized to a particular user's needs and, due to the preferred embodiment's use of the GPS and other location designation systems, coupled with the present invention's adaptability, may be installed and used virtually anywhere in the world.

A plurality of calculating and control elements are preferably fixed in a given location. Such elements or devices can be interfaced with an unlimited number of systems and apparatuses which perform very simple tasks or complex tasks. Preferably such elements control and detect electrical device voltage loads, or detect and report security system status data, for use in commercial and residential buildings, control traffic signals, interface with roadside call boxes to provide existing data for manipulation and communications tasks such as measuring road conditions, counting vehicles that pass by, measuring local temperature, and many other related application specific functions. Other applications include collecting and reporting video game scores and other interactive data, and operate conjunctively with one-way paging networks, Direct Broadcast Satellites, and cable television networks. Such fixed location elements or devices also calculate a system response based on all sorts of weighted variables, and report said variables to electronic Billboards (BBS). Such fixed location elements also respond to both existing data, manipulated data, and application specific messages and commands, and report the results of said data messages and commands to an Application Specific Central Monitoring Station (ASCMS) via data control channels and digital traffic channel that are operated by aforementioned wireless communications networks that depend upon aforementioned centralized controls. In certain circumstances, if desired, the fixed application specific communication apparatus reports the status of an electrical load control device by transmitting data information on aforesaid data control channels that reflect whether the load control device detects voltage or not.

The electrical load control device can be commanded to turn on an electrical device

or turn it off, by receiving said messages or instruction commands directly from data control channels, which are being operated by aforementioned wireless communications networks. These data messages or instruction commands originate from an Application Specific Central Monitoring Station which is connected by various communications means to a Master Central Monitoring Station (MCMS) which contains a WCASES HLR/SCP, whereby the Mobile Switching Center and the present invention's CMS is an integral intercommunicating central operating and communications control point in any of the aforementioned wireless communication networks.

The preferred embodiment of the present invention provides computer terminal displays which project status reports of various application specific stationary and mobile location devices. Such common devices include facsimile machines, consumer level computer systems, and other related devices which can act as application specific central monitoring stations for fleet management configurations and motor vehicle anti-theft and recovery configurations. The fixed location elements or devices can be customized to a particular user's needs and, due to the preferred embodiment's total adaptability and flexibility, may be installed and used virtually anywhere in the world. Of great significance is that the method and apparatus of the present invention does not require any wireless communication network infrastructure upgrades or extensive modifications, and is immediately applicable and usable with the aforementioned wireless communications systems.

Referring now to FIG. 1 and FIG. 2, a preferred embodiment of the present invention is shown, including a set of "Stationary Units" 107A-107B, and a set of "Mobile Units" 108A-108B. A stationary unit may represent any sort of fixed, non-moveable interface application such as an electrical load control management apparatus, video game management system, security system status reporting, roadside call box, or any other stationary communications application. The present invention acts as a communications interface, or enabler of communications for the operation and remote control of said fixed systems. A mobile unit can be attached and interfaced with any sort of moveable object like a motor vehicle, a person holding or wearing a communicator apparatus as in a home arrest application or medical alert application, or a cargo shipping container which contains the present invention's communications enabling technology. Such mobile objects or persons are to be monitored, located, and tracked. A communications link is provided which is represented by wireless communications transmission towers 109A and 109B, Base Stations 106A and 106B, Mobile Switching Centers 104 and 105, Integrated Services Digital Network (ISDN) 112A-112C, a paging network 448, and Public Switched Telephone Network (PSTN) 111, which

carry specialized data strings which are manipulated, translated, and encrypted data control channel information between the Stationary Unit 107A, 107B and the Mobile Unit 108A, 108B, the MSC 104, 105 and a Master Central Monitoring Station (MCMS) 100 and an Application Specific Central Monitoring Station (ASCMS) 101.

The central monitoring station and application specific central monitoring station is preferably manned by one or more trained operators 135A and 135B. Referring to FIG. 1, the Master Central Monitoring Station (MCMS) 100 contains processing systems. Inside the (MCMS) 100 are the Master Data Reception and Distribution terminal (MDRD) 113, the Master Decoder (MDEC) 114, and the Master Comparative Data Base (MCDB) 115. The MDRD receives, intercepts and scans all the data that normally flows on aforementioned control, signalling channels, digital access channels, and digital traffic channels. That is, the MDRD identifies and selects the data that is WCASES specific. The MDRD scans or "looks" at control, digital traffic channel and signalling channel data strings.

Referring now to FIG. 2, Transmitted Bitstream 426 is shown. Each WCASES Application Specific Mobile Unit 108 or Stationary Unit 107 preferably has its own distinctive WCASES Serial Number (WSN) 427A, 427B, System Identification Designation number (SID) 428A, 428B Group Identification number (GI) 429A, 428B, WCASES Identification Number 1 (WIN1) 430A, 430B WCASES Identification Number 2 (WIN2) 431A, 431B, and in some circumstances Shared Secret Data (SSD) 432A, 432B. Additional characters of information can be added to control and digital traffic channel bit streams which contain application specific information such as location specific, identification specific, and status specific data.

In normal control channel operations, digital access channels, and digital traffic channel operations, data bit streams contain reserved formats, filler messages, and user data. Such data are data bits that essentially take up space in a synchronous control channel and digital traffic channel message. These reserved formats, filler messages, or user data bits can be used in the method and apparatus of the present invention to provide additional remote access application messaging (RAAM) dialed digit Application Specific Messaging Data (AASMD) 433A, 433B on the Control Channels, Digital Access Channels, and Digital Traffic Channels of Cellular Mobile Telephone (CMT), GSM, PCS Enhanced Specialized Mobile Radio (ESMR), Satellite Cellular Hybrid (SCH), or any other wireless communications system that uses reserved formats, filler data, dialed digits, registration fields, and user data, in the control channel, digital access channel, and digital traffic channel messaging schemes. These communication systems rely upon centralized control for aforementioned operations. The mobile unit

and stationary unit send and receive application specific status messages and command or instructional messages. Referring to FIG. 1 and FIG. 3, when the stationary unit is transmitting status or any other information, it is sent to the nearest Transmission Tower 109A or 109B and Base Station 106A or 106B. The transmitted data is then relayed to its Mobile Switching Center (MSC) 104 or 105, and then relayed to the Master Central Monitoring Station (MCMS) 100.

In reference to FIG. 1 and FIG. 3, the Master Data Reception and Distribution (MDRD) terminal 113 identifies WCASES data strings by recognizing distinctive WCASES specific data information as depicted in FIG. 3. In FIG. 3, the WSN 427A, 427B, SID 428A, 428B and GI 429A, 429B is assigned to a Mobile Unit 108A or 108B, or a Stationary Unit 107A or 107B.

Referring to FIG. 1, the MDRD 113 retrieves this information from the control data bit stream and distributes said information to the Master Decoder (MDEC) 114. In some applications, the configurations of the control data bit stream and digital traffic channel bit stream is synonymous with other signalling operations that encompass HLR/VLR based Roamer Data Bases, T1 and T3 carriers, SS7, X.25 communications protocols, and other control channel, digital traffic channel, and intersystem signalling pathways.

In reference to FIG. 4 the MDEC 114 deciphers the manipulated and translated data received from the MDRD 113 which is connected to the Home System Mobile Switching Center (MSC) 104 via an ISDN interface 112, and determines what type of unit transmitted said data, and the application specific configuration of said Mobile Unit 108 or Stationary Unit 107, as illustrated in FIG.3.

In FIG. 5 the MDEC 114 is shown as having decoded the Transmitted Bitstream 426. In this application, for example, it is designated a Mobile Unit configured for Motor Vehicle anti-theft tracking and recovery. The WSN 427A, the SID 428A, the Group Identification 429A, SSD 432a, WIN group 430, and dialed digit RAAM data 433A are standard to Cellular Mobile Telephone (CMT) and Enhanced Specialized Mobile Radio (ESMR) network voice and data operations. The "A" 447 contained in the RAAM data dialed digit fields activates the RAAM feature when it is detected by the switch number parameter tables. The detected "A" 447, coupled with the detected special WIN 427A "175" NPA, activate the present invention's RAAM feature, and the automatic relay of the WCASES specific data packet to the CMS via the SS7, X.25, or ISDN network is initiated. This data is expressed here in a standard synchronous bit stream form, which is essentially transparent to the network, however in terms of

WCASES transmitted data, the decoded data breakdown is illustrated here. The Application Specific Meaning 435 relates to the letters that bracket numerical characters 'a' through 'f,' indicating the numbers being manipulated, encrypted, and translated. In an actual bit stream these characters or numbers are bits of data. However, for the purpose of illustration the data is converted from bit to decimal in FIG.3, 4, and 5.

In FIG. 5, Bracket Characters 435 indicate the interpretation of each dialed digit character. Character "a" indicates that this application is location based, and all other characters "b" through "g" are self explanatory. An important feature is that the characters derived and placed in the dialed digit fields are not entered by the user manually; they are derived and placed via automatic software and circuitry means. In reference to FIG 1, these positioning coordinates are supplied by Global Positioning System satellites 110A and 110B; however, these coordinates can be supplied by other electronic wireless positioning systems which are commonly available and can easily interface with the present invention's electronic circuitry. In FIG. 5, 433A contains many characters that represent application data that is recognized by the serving cellular system as dialed digits, but in application reality relate to status, instruction, and query response data. These illustrated data strings are structured uniform data string lengths with a specified number of data bits. This operation scheme is utilized in order to maintain control channel, digital access channel, and digital traffic channel data integrity, and contain capacity and timing of data movement, which occurs between transmission and reception channels, switch parameter table software and other systems that need controlled, synchronized and orchestrated parameters. Synchronized data movement also factor in channel capacity predictability, data error correction, and other activity. In FIG. 5, the entire operation of Data String Processing 435 and manipulation, translation, and encrypting must accord to fully synchronized standards thus described. Individual Characters and Bits 426 that are manipulated, translated, and encrypted must "look" like any other normal character and bit routinely transmitted and received on physically and logically derived data control, digital access and digital traffic channels.

Referring to FIG 6, another method of control channel data format and process is illustrated and the manner in which the present method and apparatus utilizes, manipulates, translates, and encrypts this type of control and traffic channel data. This illustration of a generic digital traffic and digital access channel structure 436, is contained within IS-54B/136, IS-95, IS-41, ETS, Global System for Mobile (GSM), and Enhanced Specialized Mobile Radio (ESMR) NEXTELL, which are national and international standards documents that set forth system operation and performance standards from the Telecommunications Industry Association (TIA), and European

Telephone Standards (ETS) for Cellular Mobile Telephone (CMT) and Enhanced Specialized Mobile Radio (ESMR) networks in the United States, Europe, and other countries. The digital traffic and digital access channel structure map 436 illustrates data mapping in the form of bits, the identification of these bits, and what these bits represent. The method and apparatus of the present invention utilizes data such as DCCH message user data 437 and 438, and Reserved Data 439 for the purpose of sending instruction and command messages, or application specific messages, to various application specific Mobile Unit and Stationary Unit communications apparatuses that operate under IS-54B/136, IS-95, IS-41, ETS, and GSM operation parameters and guidelines.

In reference now to FIG. 7, a preferred method and apparatus for manipulating, translating, and encrypting DCCH User Data 437 and 438 is schematically illustrated. In FIG. 7 a variation of DCCH user data is translated from bits to decimal characters that express application specific status messages and instruction commands that directly communicate to the mobile unit and the stationary unit communications apparatus while utilizing digital traffic channels. The present invention utilizes the digital traffic and access channel without any sort of disruption or significant increase of overall system capacity problems associated with voice channels and other related processes. As long as the logical structure meets with IS-136, IS-95 and GSM standards, this is all that matters. In FIG. 7 Decoded Application Specific Data Meanings 435 are shown. The 'H word' bracketed in User Data 437 translates to 'H=Longitude' in the Status Response column of Decoded Application Specific Data Meanings 435. In this example the longitude calculation is expressed in standard mapping coordinate. However, there are many methods and means which encompass different topographical grid coordinate systems that are utilized by Global Positioning Systems and other location and tracking systems that depend on a coordinate reference calculated from triangulated reference points. Each one of the letters placed at the bottom of the bracketed numbers appearing within the DCCH user data 437 and 438 relates to data that causes certain responses received at a Central Monitoring Station (CMS) through a Cellular Mobile Telephone (CMT) and a Enhanced Mobile Radio (ESMR) or a Satellite/Cellular Hybrid (SCH) system and certain actions initiated and completed by Mobile Unit and Stationary Unit Application Specific Apparatus, as response to said instruction commands as outlined in Decoded Application Specific Meanings 435.

In FIG. 1 the Master Comparative Data Base terminal (MCDB) 115 preferably collects decoded data from the Master Decoder terminal (MDEC) 114. While in FIG. 7, the Master Comparative Data Base (MCDB) 115 receives decoded data and searches

which customer or client this particular string of data is attributed to. The WCASES Serial Number (WSN) 427A is preferably the set of numbers that identify the type of Mobile Unit or Stationary Unit communications apparatus that is installed in a particular motor vehicle. Also the WSN identifies who the customer or client is, and other pertinent data such as his address, make of vehicle, and the like. This is designated as Client Data 440. Client Data 440 also indicates the relative position of client's vehicle, velocity, and alarm status. During an alarm or emergency situation, this Client Data 440 is relayed to a designated Application Specific Central Monitoring Station or Dispatch Center. Referring to FIG. 1, the Master Comparative Data Base 115 relays Client Data to the Application Specific Monitoring Station (ASMS) 100. As depicted here, this Application Specific Central Monitoring Station shows many different types of application specific terminals, which manage different application specific systems and services. In application, however, these various systems and services will be physically located in many different central monitoring stations or dispatch centers located throughout a city, a region, a country, or the entire world. For example, a Home Arrest (HA) Application Specific Terminal 120C can be located at another physical site, and the Master Central Monitoring Station will relay client data and status, for example, to this terminal via an SS7, X.25 and or Integrated Services Digital Network Interface (ISDN) 112A, the Public Switch Telephone Network (PSTN) 111 and another ISDN interface 112C, and, finally, to the Home Arrest (HA) Application Specific Terminal 120C, a Point-of-Sales (POS) terminal 120D, via an Application Specific Data Reception and Distribution Routing Terminal 127 and internal fiber optic or hardwire conductors of the Data Receive Digital Data Pathway 132 located inside an Application Specific Central Monitoring Station 101.

Conceivably a wide variety of application specific service terminals can be located in one monitoring facility as depicted in FIG. 1. Such application specific service terminals preferably function as Utility Management (UM) 119C that manage utility company load control devices which detect and control electrical voltage of an entire electrical city grid or a single residence or business, or a particular load control apparatus which controls and detects voltage to an individual system control such as a swimming pool motor located in a residence or apartment complex.

A stationary unit electrical load control apparatus is depicted in FIG. 9 and FIG. 10, which illustrate a preferred configuration and operation methodology. The load control device can be instructed to turn off or turn on via aforementioned transmission pathways, and report its on or off status. In FIG. 1 the application specific service terminal for Utility Management (UM) 119C receives status reports from a Stationary

Unit 107A or 107B which is configured for electrical load control via a Home Transmission Tower 109A, or "foreign" transmission tower 109B. Further, application specific status data is relayed from the transmission tower to the Home System Base Station 106A or to a "foreign" system Base Station 106B, depending on the operation location of this load control device and communications apparatus. Subsequently, application specific status data transmitted from a stationary unit which is configured as a load control device is sent from the Base Station 106A or 106B to the Mobile Switching Center 104 or 105 as desired. Depending on whether the application specific stationary unit 107A or 107B is located within the operating area of a Cellular Mobile Telephone (CMT), GSM, PCS or an Enhanced Special Mobile Radio (ESMR) network or a Satellite/Cellular Hybrid (SCH) network, and if the network is the system that the stationary unit electrical load control device is subscribed to or registered to is a home system or a "foreign" network system. If the stationary unit electrical load control device is registered to the system it is operating within, then it will send its application specific status data to the Mobile Switching Center 104 which is the home system for the WCASES system and its Master Central Monitoring Station (MCMS) 100. The home MSC 104 is connected directly to the Master Central Monitoring Center 100 and the stationary unit is preferably configured as an electrical load control apparatus which is controlled and monitored by application specific monitoring station 101 located within the same operation area of the Mobile Switching Center which is connected directly to the MCMS 100 which controls and manages a Cellular Mobile Telephone (CMT), Enhanced Mobile Radio (ESMR), or a Satellite/Cellular Hybrid (SCH) system for that given Geographical Service Area (GSA). Such stationary unit is then operating within the WCASES Home System. The home system approach is valuable for closed geographic areas. In some instances, operating wide area networks for various applications may not be necessary, and the central mobile switching center (MSC) and its collocated HLR may act as the main interface point. Furthermore, the CMS 100 can be collocated with the MSC 104. If, for example, the stationary unit electrical load control device is operating within another Cellular Mobile Telephone (CMT), Enhanced Mobile Radio (ESMR), or a Satellite/Cellular Hybrid (SCH) system which is not directly connected to the Master Central Monitoring Station (MCMS) 100, then the Stationary Unit electrical load control device is deemed a 'visiting roamer' by the 'foreign' operating system. If an Application Specific Central Monitoring Station 101 is located and operating in this 'foreign' network area it still receives application specific status data reports from the Master Central Monitoring Station (MCMS) 100 in the following manner. First, the Stationary Unit 107B which in the present example is configured as an electrical load control device transmits its application specific status data to the closest Transmission Tower 109B, the Transmission Tower relays the data to

the Base Station 106B, and the Base Station transmits the data to the 'foreign' Mobile Switching Center (MSC) 105. The 'foreign' Mobile Switching Center (MSC) 105 relays Control Channel Data, Digital Access Channel, and Digital Traffic Channel data which contains data that is specified as 'Roamer' registration information or 'Roamer' user information from its Visiting Location Register (VLR) 117 located within the 'foreign' Mobile Switching Center (MSC) 105, or directly to the CMS 100 via the SS7, ISDN network, when the CMS is configured as an HLR/SCP 118B point-of-presence on the SS7/ISDN network. However, for smaller applications, such as in the Philippines, the WCASES Roamer information data packet is relayed to the 'Home' Mobile Switching Center (MSC) 104 and the Roamer Data is verified at the Home Location Register (HLR) 118 collocated at the switch 118A. During this transfer of control channel information and user information which is deemed 'Roamer' and 'RAAM' data, the Master Central Monitoring Station (MCMS) 100 'reads' all control channel data strings, digital access channel, and digital traffic channel data strings that have been converted by the serving MSC into SS7, IS-41 or ETS protocol. The DCCH user data contained within is specifically read by the MCMS and determines which data belongs to application specific mobile units and stationary units and processes the data in the prescribed manner.

Preferably, when an application specific central monitoring station sends its command instructions to a stationary unit or mobile unit configured for a particular application specific task, the application specific terminal--in this example, the Utility Management (UM) terminal 119C--sends a command to 'report status'. This application specific command message is preferably sent to fiber optic or hardwired conductors represented by the Data Send Digital Pathway 132 located within the application specific monitoring station 101. The Data Send Digital Pathway 132 acts as a conduit for the 'report status' command data, which is relayed to the Application Specific Command & Dispatch Terminal 116. Terminal 116 is preferably directly connected to an Integrated Services Digital Network interface (ISDN) 112C. This 'report status' command data or message is sent from the dispatch terminal to the Public Switched Telephone Network (PSTN) 111. If the stationary unit 107B, which is preferably configured as a load control device, is located in a 'foreign' Mobile Cellular Telephone (CMT), or Enhanced Specialized Mobile Radio (ESMR) operations area, 'report status' command data is preferably sent to the 'foreign' Mobile Switching Center (MSC) 105 via ISDN interface 112C, the Public Switched Telephone Network (PSTN) 111, and ISDN interface 112B. This 'report status' command data is sent to the closest 'foreign' Transmission Tower 109B and base station 106B, and transmitted to stationary unit 107B, preferably configured as an electrical load control apparatus. This stationary unit 107B immediately

responds to the 'report status' command or messages and sends the 'status' of the stationary unit in the form of control channel, digital traffic channel, and digital access channel bits to the nearest Transmission Tower 109B, and relayed to the base station 106B, which recognizes this 'status data' as normal control channel, digital access channel, and digital traffic channel information. This data message is recognized as manipulated, encrypted, and translated data, which in a normal voice call is recognized as Mobile Identification Numbers (MIN), Shared Secret Data (SSD), A-Key Data, digital traffic channel DCCH User Data, control channel and digital traffic channel Filler Data, Reserved Format data, and the like, which was originally intended to enable only certain types of internal system procedures such as anti-fraud processes, voice encryption, registration, billing, intersystem communications, roaming procedures, text messages, and other related processes. This data is relayed from the base station 106B to the 'foreign' Mobile Switching Center (MSC) 105 over signalling pathways via an ISDN interface 112B to the Public Switched Digital Network (PSTN) 111 and to the Home System Mobile Switching Center (MSC) 104. The Master Central Monitoring Station (MCMS) 100 retrieves and processes this data in the aforementioned manner and relays this data to the Application Specific Central Monitoring Station (ASCMS) 101 via ISDN interfaces and the Public Switched Telephone Network (PSTN).

Preferably, the signalling formats and protocols, or SS7, X.25, ISDN, and the like, are line-of-sight microwave geosynchronous satellite signalling pathways and or equivalents. The 'status data' is processed at the Application Specific Central Monitoring Station (ASCMS) 101 and a response is made depending on the particular stationary unit status condition. As seen in FIG. 2, a region-to-region communication system is illustrated. As in FIG. 1, the method and apparatus operates essentially in the same manner, however, there are some differences in these embodiments. FIG. 2 depicts three different satellite systems that operate differently than one another. Global Positioning Satellites 110A and 110B serve the functions of providing land-based positioning coordinates to the Mobile Units 108A and 108B, and their communications apparatus which contain internally integrated global positioning receivers. A geosynchronous satellite 341 provides a communications pathway between the Master Central Monitoring Station (100) and the Application Specific Central Monitoring Station (ASCMS) 101. Satellite 341 contains a plurality of circuits, software, microprocessors, and other means well known in the art, that receive and transmit Cellular Mobile Telephone (CMT) data and voice, Enhanced Specialized Mobile Radio (ESMR), and Global System for Mobile (GSM) data and voice signals independent of other system functions thus described. Geosynchronous Satellite 341 transmits and receives Cellular Mobile Telephone (CMT), Enhanced Specialized Mobile Radio

(ESMR) control channel, digital traffic channel, T1 and T2 carrier signals, SS7, X.25 and other signalling protocols which manage and control roaming information, and other user specific data and messages. The 'Brilliant Pebbles' satellites, generically called Low Earth Orbit (LEO) satellites, 356A, 356B, 356C and 356D, preferably rotate around the Earth in a synchronized web-like pattern and provide the method and means of transmitting and receiving Cellular Mobile Telephone (CMT), Enhanced Specialized Mobile Radio (ESMR), Personal Communications Systems (PCS) voice and data signals. The method and apparatus of the present invention utilizes the same methodology with these satellite systems. That is, the ability to create a manipulated data, manipulate, translate, and encrypt control channel, digital access channel, and digital traffic channel data, and send and receive Application Specific Data to and from Stationary Units 107A, 107B and Mobile Units 108A and 108B, thereby utilizing these different satellite systems in the same manner as has been described for Cellular Mobile Telephone (CMT) and Enhanced Specialized Mobile Radio (ESMR) and related systems.

In reference to FIG. 2, satellite ground stations 357A and 357B preferably communicate directly with the Master Central Monitoring Station (MCMS) 100 and the Application Specific Central Monitoring Station (ASCMS) 101 by providing communications pathways for Application Specific Data (ASD) being sent to the Master Central Monitoring Station (MCMS) 100 from these satellite systems The satellite systems preferably directly receive and transmit data to Stationary Units 107A and 107B and Mobile Units 108A and 108B configured to transmit and receive satellite signals. These same satellite systems provide communications pathways to the Ground Stations 357A and 357B, and these stations relay this application specific data to Application Specific Central Monitoring Stations (ASCMS) 101 and the Master Central Monitoring Stations (MCMS) 100. Additionally, these satellite systems also carry terrestrial Cellular Mobile Telephone (CMT), GSM, PCS, and Enhanced Specialized Mobile Radio (ESMR) control channel data, roamer data, and digital traffic channel data in the form of synchronous T1, T2, SS7, X.25 carrier frequencies, data and carrier wave management protocols.

In FIG. 9 and FIG. 10 a Communications Apparatus 210 can be operably connected to an electrical load control apparatus 215. A principal part of this apparatus is an Application Specific Integrated Circuit (ASIC) 240 that comprises a plurality of microchips and includes the WCASES Microcomputer 200. This microcomputer controls the Data Receiver 201 and the Data Transceiver 202, which are components of the Radio Frequency Circuit 241. Data is transmitted to the Stationary Unit from a

nearby transmission tower and base station, which is first received by the Radio Frequency Circuit 241 unit Antenna 211 located on or near the Stationary Unit. The data signal passes through the antenna and through the Duplex Combiner 203 that combines the frequencies of data received by the unit and data transmitted by the Stationary Unit. In typical Cellular Mobile Telephone (CMT) and Enhanced Specialized Mobile Radio (ESMR) communication systems, communications occur in a full duplex mode; that is, voice and data signals are transmitted from communicators on separate channels and frequencies. Voice and data signals that are received by communicators are sent on separate channels and frequencies, and these actions occur simultaneously during full duplex talk and listen mode, as well as full duplex data send and receive.

In FIG. 9, it is seen that the Duplex Combiner 203 allows full duplex simultaneous communication data received by the Data Receiver 201 and sent by the Data Transmitter 202. The Microcomputer 200 also is utilized to control the functions of the specialized SNAM EPROM 206. SNAM is an acronym which stands for Specialized Number Assignment Module (SNAM). The SNAM is an EPROM micro chip that contains stored WCASES Identification Numbers (MIN), Shared Secret Data (SSD), A-Key Data, and other related control channel, digital access channel, and digital traffic channel data that can be used for dialed digits, dialed digit fields, reserved formats, filler data and other related data spaces normally used for non-application specific purposes. In addition the SNAM contains additional data, and user data used for application specific communications on control channels and digital traffic channels. The WSN Module 204 stores the 32-bit 7-character number that represents the WCASES Serial Number (ESN). The WSN is a permanently stored number that uniquely identifies this particular Stationary Unit in the previously described manner.

In FIG. 9 the Correlator 228 is also controlled by microcomputer 200 and acts as a data collector. Data is route to correlator 228 by microcomputer 200 from application specific devices interfaced to input ports 208A. Correlator 228 is preferably a microcompressor and functions as a collector of data directly derived form the application specific apparatus 210 interfaced with input ports 208A. Microcomputer 200 preferably sends this collected data to the SNAM EPROM 206. Preferably, when the stationary unit transmits data on a control or digital traffic channel, microcomputer 200 instructs data transmitter 202 to lock on the strongest channel. Microcomputer 200 instructs SNAM EPROM 206 to send data to data transceiver 202 while simultaneously, microcomputer 200 instructs correlator 228 to send the data it has collected to SNAM EPROM 206. Accumulated data is then preferably sent to the nearest CMT, PCS, GSM network of ESMR network of SCH network, and the network relays this data to the

MCMS in the aforementioned manner.

As shown in FIG. 1, when ASCM 101 sends data to stationary unit 107A, 107B or a mobile unit 108 A or 108B, the MCMS 100 relays this data to the MSC 104, and the MSC determines the system location of the stationary or mobile unit, and then sends these instructions to the respective unit. Best seen in FIG. 9, the preferred method and apparatus utilizes communications apparatus 210 which is a standardized WCASES system, thereby allowing for a tremendous amount of diverse application specific systems and apparatuses to be interfaced with communications apparatus 210.

In FIGS. 10, 11, and 12 three different application specific apparatuses are shown that perform separate and distinct functions. However, the present invention is not limited to being interfaced with only three application specific apparatuses. In fact, a wide variety of application specific devices may be interfaced, performing an almost limitless number of status data gathering tasks, from a wide variety of sensor types and systems that take measurements electronically, and derive electronic digital data status from such measurements.

In reference to FIG. 9, communications apparatus 210 includes input ports 208A and output ports 214A. These ports can be configured to accept RS232 devices, DIN PIN 9 pin in interfaces, RS422 serial and parallel inputs, and any other format of interface plug.

In reference to FIGS. 10, 11, and 12, all apparatuses shown contain input ports 208B and output ports 214B. Input ports 208B are interfaceable with input ports 208A of communications apparatus 210, as are output ports 214B. In FIG. 10, in one example of an application specific application, stationary unit load control device 215 is interfaced with communications apparatus 210, input port 208A, and output port 214A is operably connected to output port 214B of FIG. 10. Stationary unit load control device 210 may be used to control and monitor any sort of 120-volt AC device or any 220 volt AC device, for example, power company switching, utility control, swimming pool motors, street lights, air conditioning systems, and the like.

Another example of the operation and use of the method and apparatus of the present invention is seen in FIG. 10, where load control apparatus 215 controls electrical appliance 223 connected to load port B 227, which provides 120V AC rated at 20 amps. The 120V 20-amp relay 225 is shown closed, providing a complete circuit whereby appliance 223 is turned on and fully powered. Input port conductor 230 is preferably connected to load control sensor circuit 229 which sends bit data indicating

that the 'circuit is powered' to Microcomputer 200 as shown in FIG 9. Microcomputer 200 sends status bits to correlator 228.

In FIG. 1, when ASCMS 101 sends command data instructing stationary unit 107A to 'transmit status data', this action preferably occurs over aforementioned transmission mediums, depending upon what type of system the stationary unit is operating in. The stationary could be configured as a cellular transceiver and pager receiver. Best seen in FIG. 17, command data bitmaps 228 are preferably transmitted over control channels, digital satellite, digital control channels, DCCH and digital traffic channels within the CMT, GSM, PCS, ESMR and SCH networks. Bitmap 438 illustrates command data messages sent to a communications apparatus over the forward digital traffic channel, digital access channel, or DCCH from the ASCMS 101 to the MCMS 101, to the MSC 100, to the base station 106A and transmission tower 109A, and to the stationary unit 107A and it communication apparatus, via SS7, ISDN 112A, 112B, 112C, and PSTN 111 networks. All of the bitmaps shown 438, 441, and 443 are bitmap formats operating on analog and digital cellular telephone systems, GSM, PCS, CDMA and enhanced specialized mobile radio systems such as NEXTELL, and related systems forward analog and digital control channels, digital access channels and forward digital traffic channels. Bitmap 438 illustrates a command data string sent over the forward digital traffic channel, digital access, and DCCH of a digital cellular telephone system, PCS and/or enhanced specialized mobile radio system. Such bitmap can also be used in a global system for mobile system GSM as well. Bitmap 438 shows letters 'A' through 'G' and bracketed sets of numbers of command words. Each letter represents a command or instruction sent from the application specific central monitoring station. Application specific data meanings 442 show what each letter represents on the bitmap and the other two illustrated bitmaps. These bitmaps show various types of command data sent to different types of stationary units and mobile units on their respective communications apparatus. In practice, the only command words or messages that are sent to a particular unit are the words or messages that relate to that particular application specific apparatus configuration and particular function. For example, bitmap 438 shows various command words or messages that cause certain responses from the application specific apparatus controlled by the communications apparatus. Application specific command data meanings 422 shown that the 'A word' on bitmap 438 commands an electrical load control unit to 'turn off'. The 'B word' commands this same unit to respond with status. In this case, status data indicates that the unit is turned off because of the action taken by the communications apparatus as a response to the 'A word' that preceded the 'B word' as a command.

In FIGS. 9 and 10, the communications apparatus 210 receives the 'A word' command to turn off, and data receiver 201 receives the bit stream which contains the 'A word' through antenna 211 and duplex combiner 203. The data receiver 201 then sends this command data to microcomputer 200. Microcomputer 200 determines that this command data contains the 'A word' and sends data bits to output port conductor 231 which is connected to the input N.O. point of the control module 227 for the 120V 20 amp relay controlling the 20V 20-amp appliance 223, which in turn opens this relay thereby cutting its power source. Immediately, because communications apparatus 210 received the 'B word', it transmits a bit stream which contains data that signals the application specific utility management terminal its 'power off' status. In FIG. 10 Load A 205 is not used nor is Load A Relay 207. However, in a different application, Load A and Load A Relay can be fully functioning and the input conductor 233 functions in a similar manner as input conductor 230 thereby detecting whether Load B Relay is open or closed, or powered or non-powered. The AC power supply 224 that powered the load control apparatus 215 can either be 120 volt AC or 240 volt AC, depending on the power requirements of the appliance or system it is managing.

Referring now to FIG. 11, a global positioning system receiver is shown and the interface with communications apparatus 210 via input and output ports, thereby allowing data bits to flow back and forth between the two apparatus as shown in Fig. 9. Together, FIGS. 9 and 10 illustrate a compete mobile unit, configured, for example, for locating, tracking, and protecting a motor vehicle as used in automobile tracking and anti-theft applications. Of course, this combined mobile unit may also be used for a wide variety or other applications such as fleet management of motor vehicles, including trucks, taxis, ambulances, police vehicles, and other public and private fleet vehicles. For example, Auto Security System 315 detects a vehicle intrusion which is indicated by an open contact closure 316 which is preferably fitted to a vehicle door, trunk lid, or hood. Auto Security System 315, having detected an intrusion, sends alarm data and status information to Communications Apparatus 210 via an Input Port conductor 317 and to microcomputer 200 which instructs the integrated circuits to send manipulated and translated data through the Radio Frequency Circuit 241 and on through the Wireless Network and to the central monitoring stations in the aforementioned manner, whereby the Master Central Monitoring Station (MCMS) and the Application Specific Central Monitoring Station (ASCMS) receives, processes, and responds to the manipulated and the translated data in relation to its status.

Another example of the operation of Communications Apparatus 210 is when Communications Apparatus 210 receives command instructions from the central

monitoring stations to send location status. The Radio Frequency Circuit 241 receives command instructions via the unit Antenna 211, Duplex Combiner 203, Data Receiver 201, and then relays this data to the Application Specific Integrated Circuit (ASIC) 240. Microcomputer 200 transmits instructions to Location Apparatus 216 via Output Port conductors 231, 232, and to the GPS Microcomputer 303 so as to forward location coordinates to Input Port conductors 230, 233 and to the Correlator 228, the Data Transmitter 202, the Power Amp 209, Antenna 211, and into the wireless network in the aforementioned manner.

In reference to FIG. 18, Game Unit 217 is preferably directly interfaced to Communications Apparatus 210 depicted in FIG. 9, via Input Ports 208A, 208B, and Output Ports 214A and 214B. Referring to FIGS. 9 and 12, Communications Apparatus 210 and Game Unit 217 are communicatively joined as one Integrated Video Game Communications Unit 103. Game Unit 217 represent a generic game caddy which could be any home, casino gambling, or arcade video game playing apparatus. Of course, such could be downloaded and connected to Game Unit 217.

Referring now to FIGS. 9 and 12, Integrated Video Game Communications Unit (IVGCU) 103 preferably includes video game firmware or Software Module 218 integrated with Communications Apparatus 210 via Input Port 208A, 208B, conductors 230, 233, and Output Port 214A, 214B, conductors 231 and 232. Seen in FIGS. 9, 10, and 13, the method and apparatus of the present invention provides a very efficient and inexpensive means and method to provide video game scores, gambling bets, odds, type of gaming to be played, levels of play, duration of play, particular game identification, and other data which is manipulated, translated, and transmitted to the Video Game Cable Channel Head End 102 in the same manner as that described for the other Application Specific Apparatus and Communication Apparatus systems. The IVGUC 103 preferably transmits gaming data into the wireless network in the aforementioned manner, and the Cable Head End 102 functions as an Applications Specific Dispatch Center that in turn broadcasts said gaming scores and other data to the users. This same center can be placed at a gambling casino. A television set or monitor 236 illustrates the game score and player status 226. However, a cable television video game channel may transmit game score and player status, bets, paramutuals for horse racing, Keno, and sports betting for video game and gambling players from different parts of the country simultaneously. Best seen in FIG. 13, the Cable Head End 102 operably receives Application Specific Data and translates this data back to alpha numeric text as seen on television monitor 236 and then broadcasts it in the manner described above.

In FIGS. 14, 15, and 16, flow charts illustrate the method of control data processing, shown according to a preferred embodiment of the invention. Steps 400 through 445 show typical operations routine in a wireless network, including the method of the present invention. It is seen that when a Mobile Stationary Unit is activated, the Power On 400 sequence preferably initializes the ASIC circuits (computer) 401 to initialize a registration routine that in turn causes the WSN/WIN/RAAM dialed digit field data 402 and other data to be transmitted. The ASIC circuits then cause the Data Transceiver to tune to the strongest paging, forward control channel, forward digital access channel, or forward digital traffic channel 404. Simultaneously the ASIC computer detects status bits 405 and send these bits to Correlator 406. Correlator 406 sends bits to ASIC computer 407 which adds modified bits to the overall synchronous bit stream and sends these bits to SNAM 408. SNAM send bits to ASIC computer 409 and ASIC computer 409 sends a data bit stream to data transceiver 410. Subsequently, the data transceiver sends the bit stream to the mobile switching center (MSC) 412. MSC 412 receives and processes the control channel, digital access channel, and digital data 414 data at the MCMS via conversion to SS7 IS-41 protocol. MCMS preferably retrieves WCASES specific data bit streams that have been converted from air interface data to IS-41 SS7 signalling protocol, from control channels, digital access, and digital traffic channels 415. MCMS decodes WCASES specific data 416 and sends decoded data to ASCMS or to the Video Game Channel Cable Head End (GCCH) 417, gaming casino control center, point-of-sales, security system, or any other designated application specific central monitoring station.

The ASCMS receives decoded data 418 and the Application Specific Data Reception and Distribution Terminal (ASDRD) distributes such data to Application Specific Data Terminals (ASDT), which can also be located at GCCH 419, if desired. The ASDT receives status information data 420 and the ASDT software processes status data 421 to determine status. Then the ASDT transmits command data words to the MSC 422 which receives and transmits command data words on the forward control channels, forward digital control channels DCCH, satellite forward channels, and conventional one-way paging networks PNCC or forward digital traffic channels 423 for determination with the ASM or stationary unit, and then transmits command data to the base station and transmission tower closest to the ASM or stationary unit 425. The base station then preferably transmits command bit stream data 426 to ASM or the stationary unit, and the ASM or stationary unit then responds to command data 455. During response procedure, the method begins all over again as shown in FIG. 14, for the ASIC responds to command data in the same manner as its operations sequence during a power up and registration sequence as shown. Preferably the power on

sequence 400 is not repeated, however, specification 401 through 421 are repeated. The process halts here if no command data need to be sent to the ASM or stationary unit. If command data needs to be sent as a result of the ASCMS determining its status, then operations specification 401 through 455 are completed.

In FIG. 17 a Command Data Bitmap is shown, illustrating forward control channel digital access channel and forward digital traffic channel command data words and the data bit streams which carry the command data words. Command data words for the digital traffic channel 438 are decoded 442, preferably in the form of words A through H. Overhead or forward control channel Command Data words are preferably expressed in the form 441. Additionally, reserved format and/or RAAM dialed digit field data 433A is manipulated and translated and the meanings are expressed by decoding the 'H word', in the Application Specific Command Data Meaning box 442. Such examples of command data words being sent on forward control channels, forward digital access channels, DCCH, one-way paging networks via POCSAG or FLEX paging protocols, satellites, and forward digital traffic channels cause the previously discussed actions for the ASM or Stationary Unit and the internal communications apparatus and subsequently controlled Application Specific Apparatus.

Referring now to Fig. 18, it is seen how the Communications Apparatus 210 can be operably coupled to an almost unlimited number of application specific devices. For example; a load control apparatus 215, a location apparatus 216 such as a GPS based system, a Game Unit 217, a home arrest apparatus 321, a personnel tracking system 322, a security system apparatus for home or business 323, an emissions measurement apparatus 324, gas or oil well head sensor 329, a utility meter reading apparatus 330, a road side call box apparatus 331, or the like. The applications are truly large and varied. Status and command data can be sent and received in a uniform and transparent manner in existing wireless networks, without disruption of the network or overloading of the network, and without requiring infrastructure upgrades, with only some software modification requirements at an existing MSC and the internal processing systems.

Referring to Fig. 19, the illustration shows how the WCASES MCMS 100 interfaces with a cellular mobile telephone MSC 443, an enhanced specialized mobile radio (ESMR) MSC 444, a Global System for Mobile (GSM) MSC 444, and a person communication system (PCS) MSC 446 that could be a IS-95 CDMA MSC or any other PCS related platform. All the depicted MSCs can send data of the MCMS 100 in real time, for the MCMS is a true interformatted data processing and management center. All air-interface converted data is sent on the ISDN/SS7 network 112A. In turn, application data is routed to application specific central monitoring stations 101 via public switched

telephone network (PSTN) with various protocols such as; dial in direct (DID) modem V.35, 19.2, 28.8, 56 kbps frame relay, T1, DSO, ISDN-B, ISDN-A, T1-128A, Ethernet, TCAP, TCP/IP, FTP, Internet point-of-presence. In fact, the entire network can operate via the Internet and world wide web (WWW).

Referring to Fig. 20, the illustration depicts a WCASES Location Communicator that is configured as a personal locator mobile unit 108C. This communicator contains a normal voice service related cellular analog/digital transceiver, plus circuitry that supports WCASES data protocols, a normal but fully integrated one-way paging receiver, and a global positioning GPS receiver 454, a GPS antenna 453, and power supply support electronics 455. The flip-out enclosure housing 452 contains all the aforementioned electronics, plus it acts as a container for the voice service microphone 463. This truly novel approach allows for easy access to the GPS satellite transmitted C/P correlator bits that, when received from the GPS satellites 110A and 110B, are processed by the GPS receiver, that in fact reveals its relative earth bound location. The flip-out GPS housing moves from a closed position to an open position 457. When a new GPS position is desired by the location phone user, he simply opens the flip-out housing, makes sure he has clear line-of-sight, and the green led light 461 flashes telling the user that a new location has been calculated. Once this is accomplished he simply closes the location communicators 108C flip-out housing 452 and continues on. The new location update just derived from the explained procedure also causes an automatic transmission of the location information to be transmitted to the MCMS via the present invention's WCASES RAAM methodology. This is just one way to send such data. The location communicator 108C has a red LED 460 that flashes when a message has been transmitted from any of the configured downlink transmission mediums, such as satellite, DCCH or normal one-way paging. The instruction from the application specific central monitoring station could be "Report Your Position" 451 which is a readout on the units LCD display 450. Once this accomplished in the heretofore mentioned manner, other functions can be utilized. For example, in a two-way paging scenario, the location communicator user receives a page that he wants to respond to. If he does not want to use the voice channels, he may use the menu key 458, scroll one of the programmed "canned" messages, such as "I'll call you tonight at home", message 6, press the set button 464 and then press the send button 459. A message containing his canned response plus location information is sent via the serving cellular system network, and in particular using the present invention RAAM feature procedure, and completes the two-way paging action. Once this is done the user will hear a stutter dial tone from the location unit, or two-way paging units speaker 462. The host cellular or PCS carrier can opt to utilize a recording to be sent on the forward voice channel, for example, "Your

message as been sent", or choose to only send a completion indicator on the forward control or digital paging channel. The communicator software will detect the overhead action that in fact causes the completion of the message action or transaction. The communicator battery 456 powers all the communicator's components. The LCD screen 450 displays all the information received from the GPS receiver, the paging receiver, and any status that needs to be displayed to the user concerning the operations status of the cellular transceiver and distinctive WCASES data communications.

Additional advantages and modifications will readily occur to those skilled in the art. The invention in its broader aspects is, therefore, not limited to the specific details, representative methods and apparatus, and illustrative examples shown and described. The application specific uses are nearly endless, such as, for example: home security monitoring; security system remote control panels; child protection; remote drug or alcohol monitoring by placement of a micro sensing chip on a user for transmission to the communicator apparatus which can transmit such data into a wireless network; environmental sensors for monitoring various environmental parameters such as pollution, snowfall, wind speed or the like; protection and monitoring of the aged or infirm, where the communicator is interfaced to a non-removable wrist band or leg band that contains a separate transmitter that transmits coded data to the communicator apparatus for detection of a signal from the wrist band; home arrest applications, and any other application that requires location, identification, and status information. Accordingly, departures may be made from such details disclosed herein without departing from the spirit or scope of the applicant's general inventive concept.

Claims

1. A method for seamlessly transmitting application specific messages over cellular radio system control channels and switches, comprising:

transmitting application specific messaging bits as a data packet configured to appear as an origination data packet having from eight- to thirty-two-digit fields containing data related to an application specific system utilizing control channel means and cellular switch remote feature control access request means;

transmitting said messaging bits over cellular control channels utilizing AMP, D-AMPS and TACS, FSK modulated reverse control channel RECC 10 Kbps 48 word BCH hamming coded control channel means; and

applying said messaging bits to communicate with, identify, monitor, and locate said application specific system, thereby allowing for an integrated application specific two-way communications system.

2. The method claim 1, wherein said application specific system comprises a two-way paging system.

3. The method of claim 1, wherein said application specific system comprises a motor vehicle location status system.

4. The method of claim 1, wherein said application specific system comprises a personal location status system.

5. The method of claim 1, wherein said application specific system comprises a home arrest status system.

6. The method of claim 1, wherein said application specific system comprises a security system.

7. The method of claim 1, wherein said application specific system comprises a utility meter reading status system.

8. The method of claim 1, wherein said cellular radio system is configured to scan, read, collect, and process said application specific messages from said AMP, D-AMPS and TACS, FSK modulated reverse control channel RECC 10 Kbps 48-

* C L M S *

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word BCH hamming coded control channel means at a base transceiver and a mobile switching center.

9. The method of claim 1, further including means for processing and routing control channel application specific data from a base transceiver station and a mobile switching center to a control channel application data master central monitoring station via a modem.

10. The method of claim 1, wherein said modem is an SS7 modem operably linked to an SS7 network.

11. The method of claim 1, further including creating, processing, and transmitting alpha numeric messages over said SS7 network.

12. A method for transmitting application specific messages over cellular radio system control channels and switches, comprising:

transmitting application specific messaging bits as a data packet configured to appear as an origination data packet having from eight- to thirty-two-digit fields containing data related to an application specific system utilizing control channel means;

transmitting said messaging bits over cellular control channels utilizing AMP, D-AMPS and TACS, FSK modulated reverse control channel RECC 10 Kbps 48 word BCH hamming coded control channel means; and

applying said messaging bits to communicate with, identify, monitor, and locate said application specific system, thereby allowing for an integrated application specific two-way communications system.

13. A method for converting data within an control channel application specific communicator configured as a integrated paging network receiver and cellular network control channel application specific transmitter, comprising:

receiving data commands and instructions from a paging network;

processing said data commands and instructions; and

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* C L M S *

transmitting automatically application specific data status messages as a data packet configured to appear as an origination packet having from eight- to thirty-two-digit fields over AMPS, D-AMPS and TACS FSK modulated reverse control channel RECC 48 bit BCH hamming coded control channels utilizing compatible control channel protocols, allowing for an integrated application specific two-way communications system utilizing existing cellular radio networks and paging networks, thereby creating a control channel application data virtual communications system.

14. An apparatus for direct wireless communication on an existing wireless communication network, comprising:

circuitry means for taking existing data and manipulating said existing data to create a manipulated data;

means for translating said manipulated data into an application specific message;

means for applying said application specific message to control and communicate with an application specific apparatus, whereby wireless communication on said existing wireless communication network is provided without causing disruption, system overloading or limitation on normal system communication activity.

15. The apparatus for direct wireless communication of claim 14, wherein said circuitry means comprise a plurality of circuits operably linked allowing for manipulation and control of existing data to create said manipulated data.

16. The apparatus for direct wireless communication of claim 14, wherein said means for translating said manipulated data comprise a plurality of circuits operably controlled by software means.

17. The apparatus for direct wireless communication of claim 14, wherein said means for translating said manipulated data comprise a microprocessor.

18. A method for wireless communication on existing wireless communication networks and switches for manipulation, translation, and encryption of control channel data bits, comprising:

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taking existing data and manipulating said existing data to create a manipulated data;

translating said manipulated data into an application specific message;

applying said application specific message to control and communicate with an application specific apparatus, whereby wireless communication on said existing wireless communication network is provided without causing disruption, system overloading, or limitation on normal system communication activity.

19. The method for wireless communication of claim 18, wherein said manipulated data is transmitted through a plurality of control channels and digital traffic channels as a direct communication pathway for direct control of an application specific communications apparatus.

20. The method for wireless communication of claim 18, wherein said manipulated data is transmitted through a plurality of control channels and digital traffic channels as a direct communication pathway for direct control of an application specific control and management apparatus.

21. The method for wireless communication of claim 18, wherein said application specific message is applied to communicate with and control a monitoring device.

22. The method for wireless communication of claim 18, wherein said application specific message is applied to communicate with and control a game apparatus.

23. The method for wireless communication of claim 18, wherein said application specific message is applied to communicate with and control a traffic signal control apparatus.

24. The method for wireless communication of claim 18, wherein said application specific message is applied to communicate with and control a shipping container tracking apparatus.

25. The method for wireless communication of claim 18, wherein said application specific message is applied to communicate with and control a call box add-on service.

* C L M S *

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26. The method for wireless communication of claim 18, wherein said application specific message is applied to communicate with and control a security system status reporting apparatus.

27. The method for wireless communication of claim 18, wherein said application specific message is applied to communicate and control a vehicle anti-theft and recovery apparatus.

28. The method for wireless communication of claim 18, wherein said application specific message is applied to communicate and control a two-way paging apparatus.

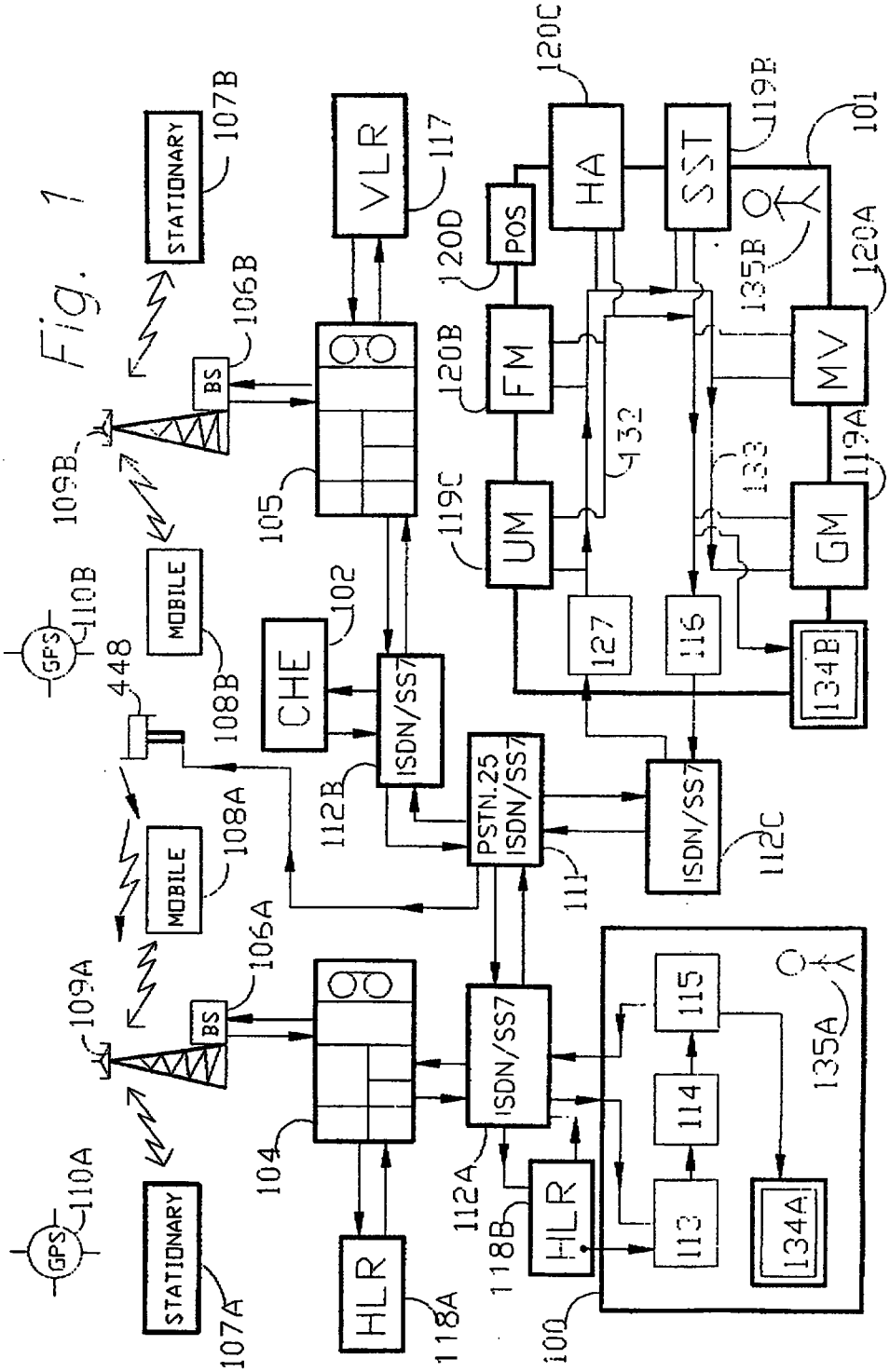
29. The method for wireless communication of claim 18, herein said application specific message is applied to communicate and control a point-of-sales apparatus.

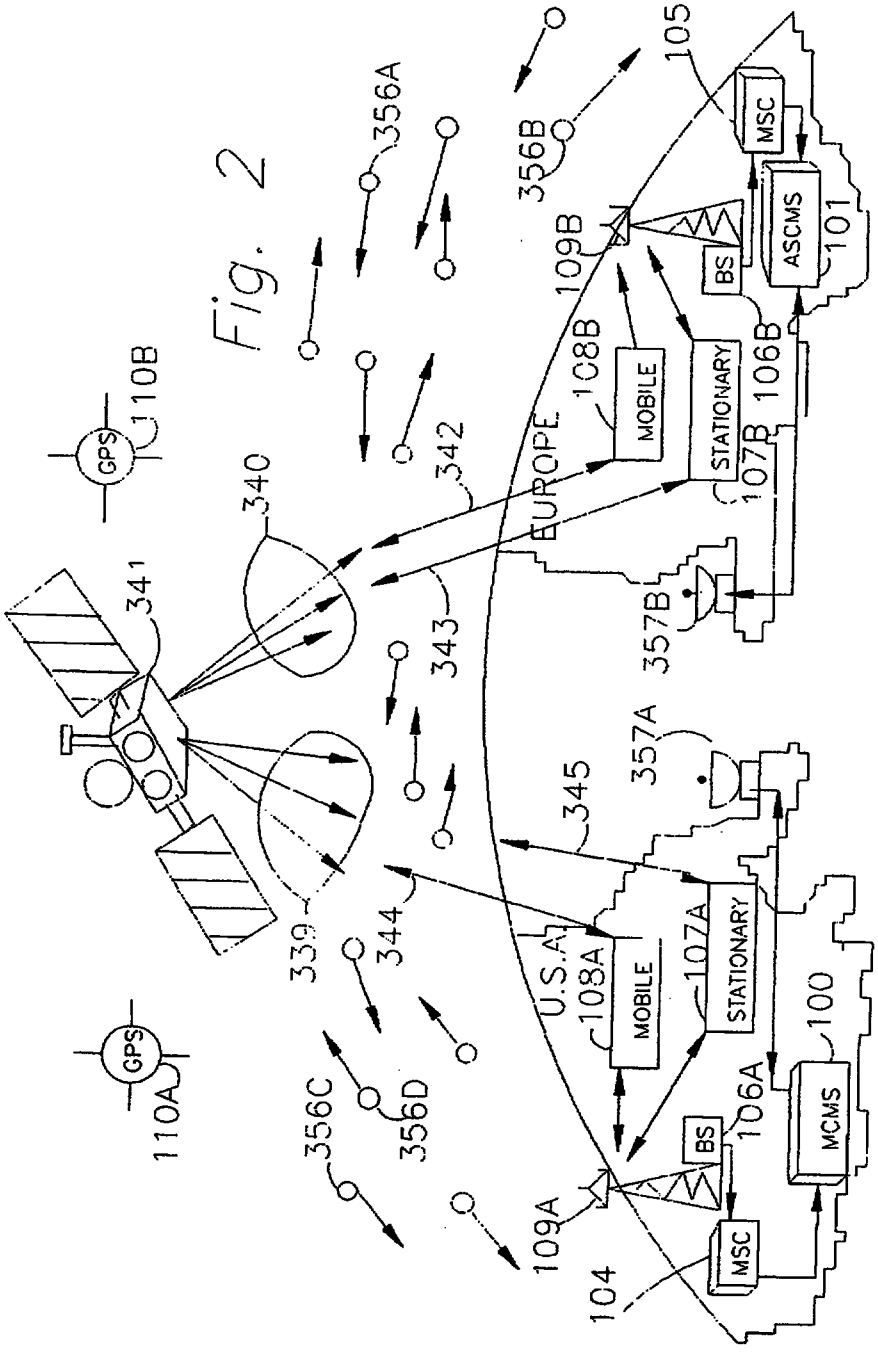
30. The method for wireless communication of claim 18, herein said application specific message is applied to communicate and control a wireless gambling apparatus.

CLMS

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Fig. 1


STATIONARY
107B
VLR
117
120C
HA
SST
119B
101
106B
BS
POS
120D
135B
109B
105
FM
120B
MV
120A
MOBILE
108B
CHE
102
UM
119C
132
133
GM
119A
GPS
110B
448
127
116
134B
ISDN/SS7
PSTN.25
ISDN/SS7
112B
111
112C
MOBILE
108A
106A
109A
BS
ISDN/SS7
115
114
135A
104
112A
118B
HLR
113
134A
GPS
110A
STATIONARY
107A
HLR
118A
100


Fig. 2
GPS
110B
GPS
110A
341
340
342
343
339
344
345
356A
356B
356C
356D
105
MSC
ASCMS
101
BS
109B
108B
MOBILE
STATIONARY
106B
107B
EUROPE
357B
357A
U.S.A.
108A
MOBILE
107A
STATIONARY
100
MCMS
106A
BS
109A
MSC
104

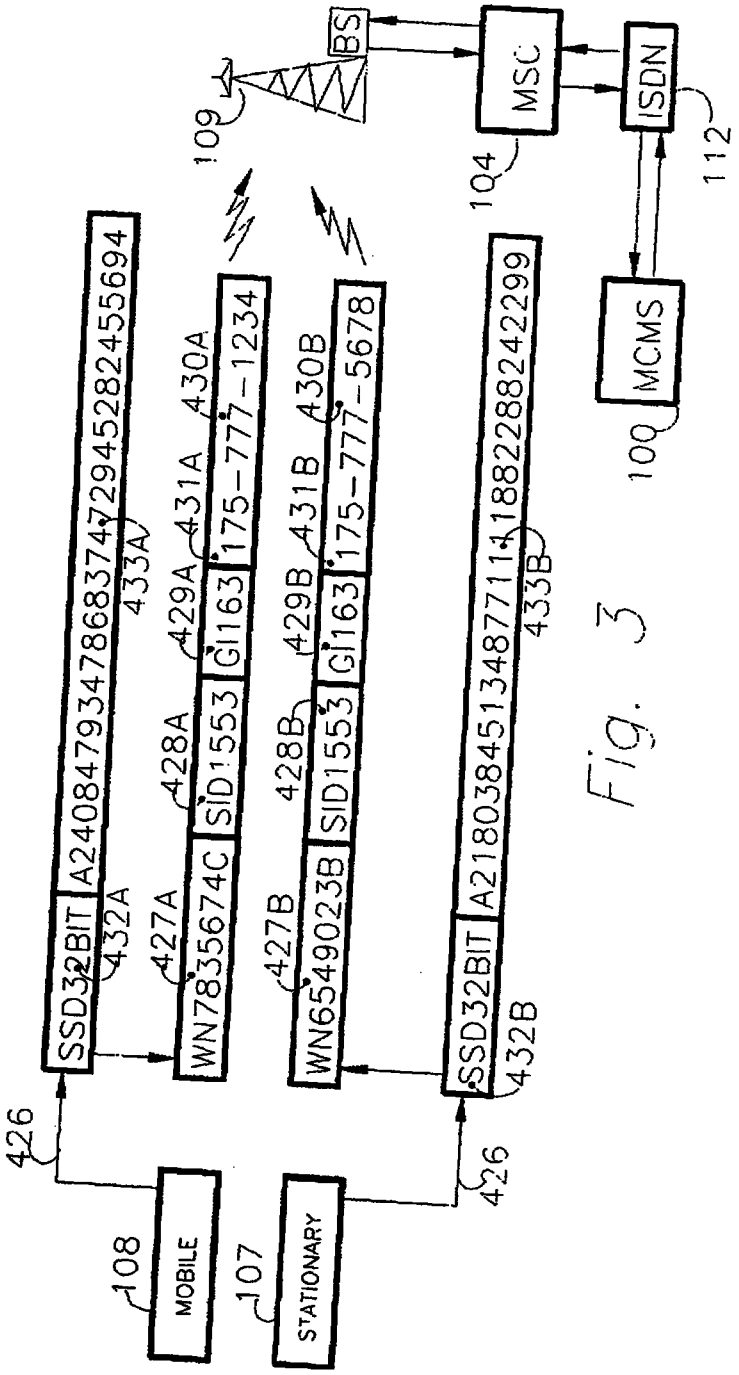

BS
109
MSC
104
ISDN
112
MCMS
100
SSD32BIT
A240847934786837472945282455694
433A
GI163
175-777-1234
430A
431A
429A
SID1553
428A
WN7835674C
427A
432A
426
MOBILE
108
SSD32BIT
A2180384513487711188228824299
433B
GI163
175-777-5678
430B
431B
429B
SID1553
428B
WN6549023B
427B
432B
426
STATIONARY
107

Fig. 3

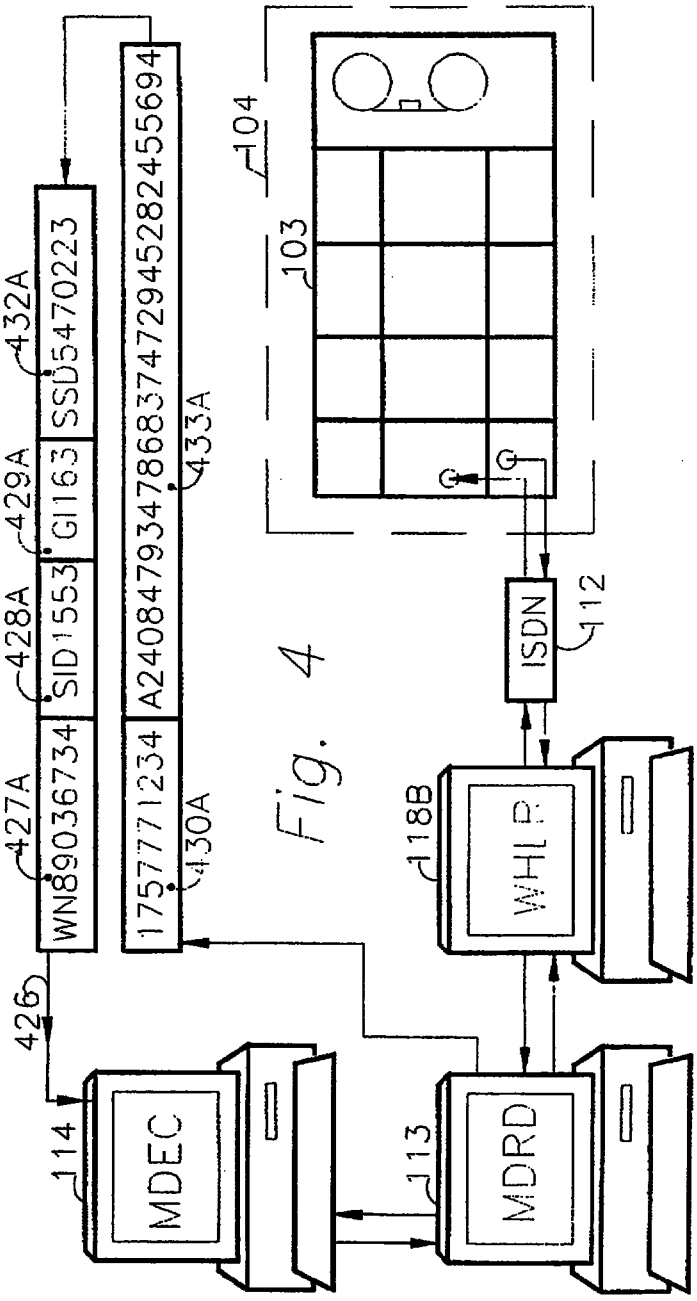

104
103
ISDN
112
118B
WHLR
MDEC
114
MDRD
113
426
427A
WN8903673 4
428A
SID1553
429A
GI163
432A
SSD5470223
433A
A2408479347868374729452824556 94
430A
1757771234

Fig. 4

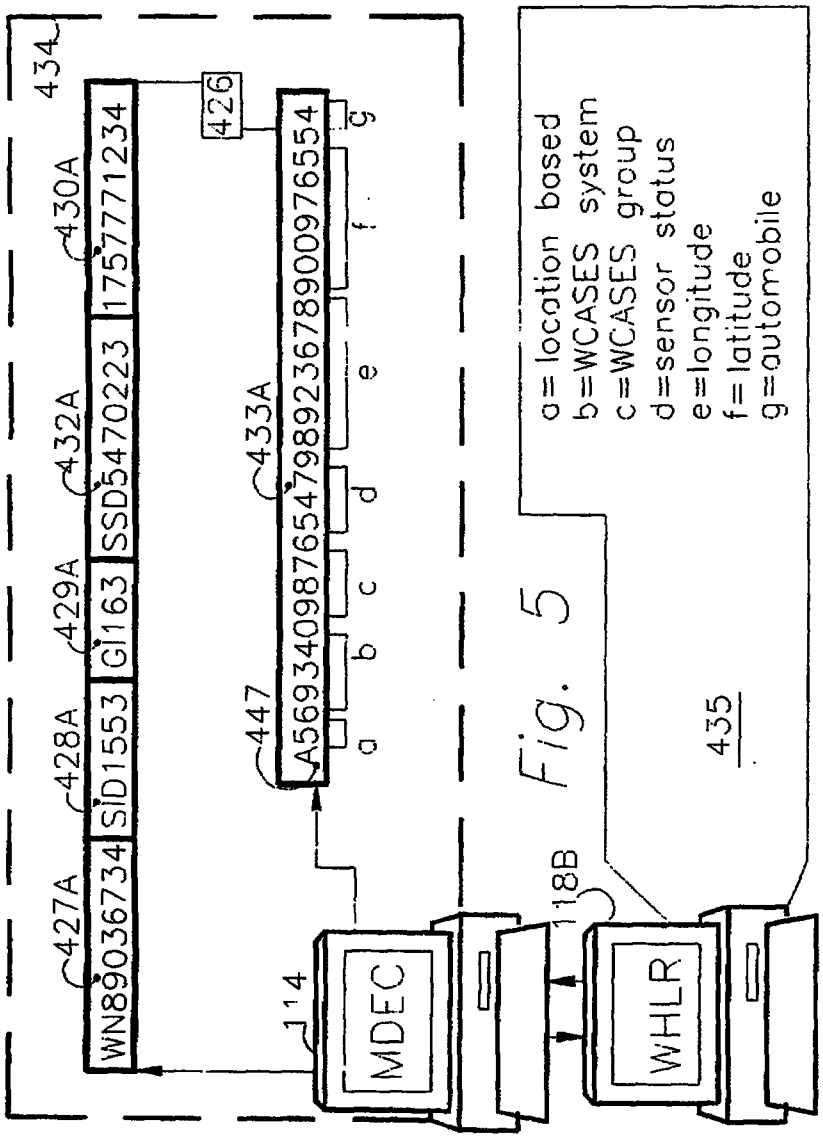
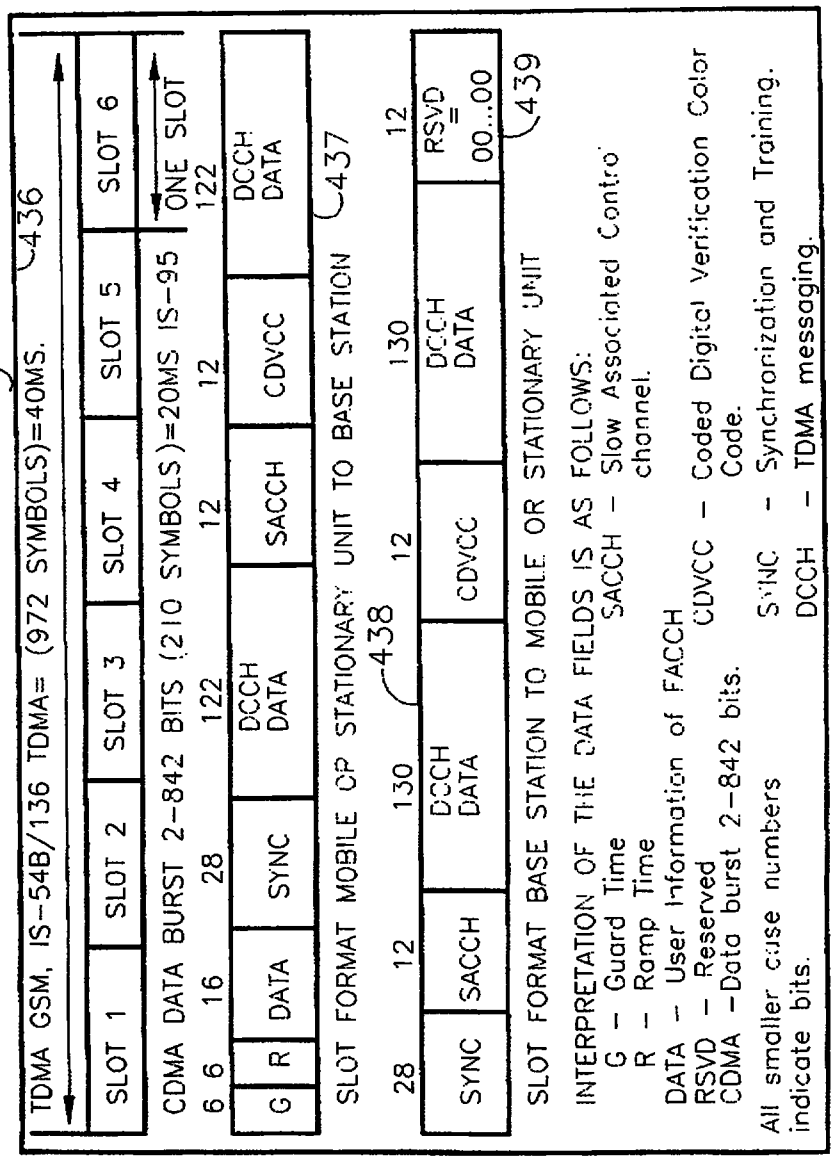

434
426
430A
175771234
432A
SSD5470223
429A
GI163
428A
SID1553
427A
WN8903673 4
433A
A5693409876547892367890097655 4
447
a b c d e f g
a= location based
b=WCASES system
c=WCASES group
d=sensor status
e=longitude
f= latitude
g=automobile
435
118B
114
MDEC
WHLR

Fig. 5

Fig. 6


TDMA GSM, IS-54B/136 TDMA= (972 SYMBOLS)=40MS.
436
SLOT 1
SLOT 2
SLOT 3
SLOT 4
SLOT 5
SLOT 6
ONE SLOT
CDMA DATA BURST 2-842 BITS (210 SYMBOLS)=20MS IS-95
6 6 16 28 122 12 12 122
G R DATA SYNC DCCH DATA SACCH CDVCC DCCH DATA
SLOT FORMAT MOBILE OR STATIONARY UNIT TO BASE STATION
437
28 12 130 12 130 12
SYNC SACCH DCCH DATA CDVCC DCCH DATA RSVD = 00...00
438
SLOT FORMAT BASE STATION TO MOBILE OR STATIONARY UNIT
439
INTERPRETATION OF THE DATA FIELDS IS AS FOLLOWS:
G - Guard Time
R - Ramp Time
DATA - User Information of FACCH
RSVD - Reserved
CDMA - Data burst 2-842 bits.
SACCH - Slow Associated Control channel.
CDVCC - Coded Digital Verification Color Code.
SYNC - Synchronization and Training.
DCCH - TDMA messaging.
All smaller case numbers indicate bits.

SLOT FORMAT USER STATUS DATA SENT TO BASE STATION.

139001800065001001200230034004500560067007800 8123

H I J K L

437

Fig. 7

438

SLOT FORMAT INSTRUCTION DATA TO MOBILE OR STATIONARY UNIT.

111123000065000076001400018100000100000230000120

M N O P Q R

Status Response	Instruction Commands
H = Longitude	M = Send Location Status
I = Latitude 435	N = Send Security Status
J = Velocity	O = Perform Location Update
K = Zone 1 PIR Normal	P = Standby For Destination
L = Zone 2 Level Sensor Normal	Q = Longitude of Destination
	R = Latitude of Destination

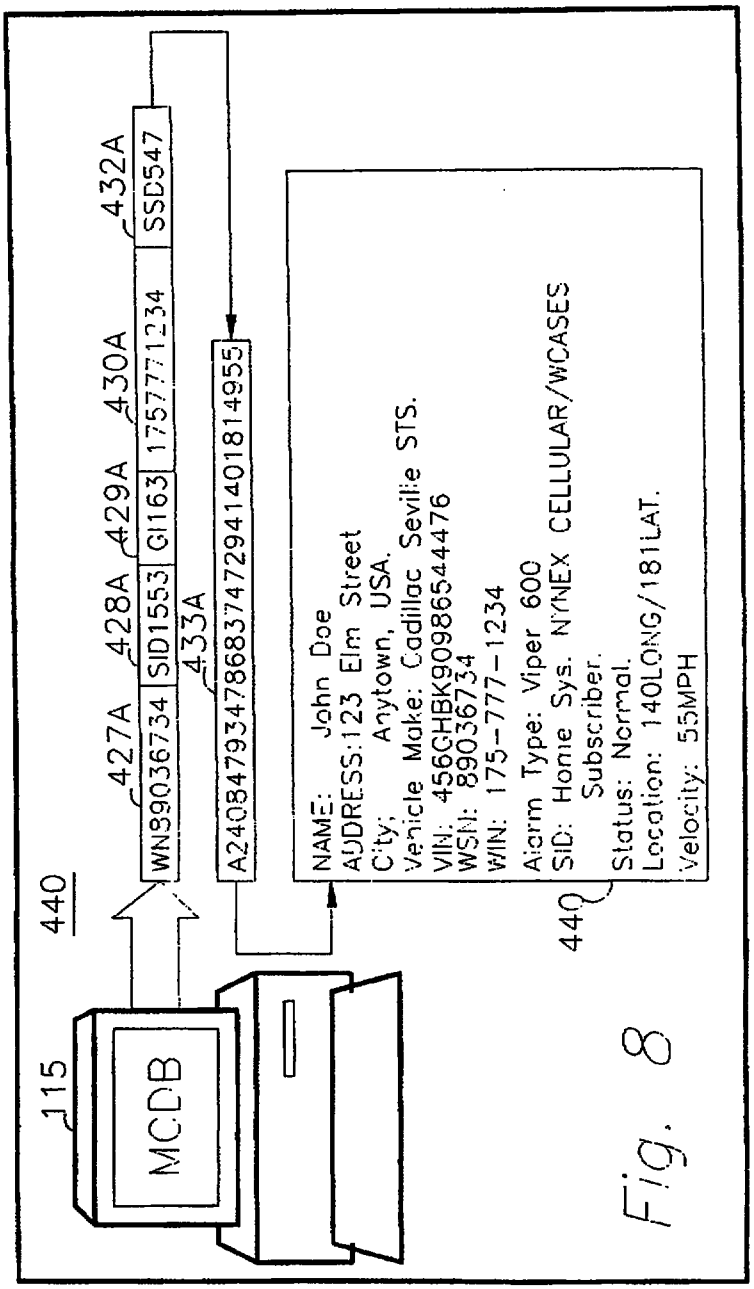
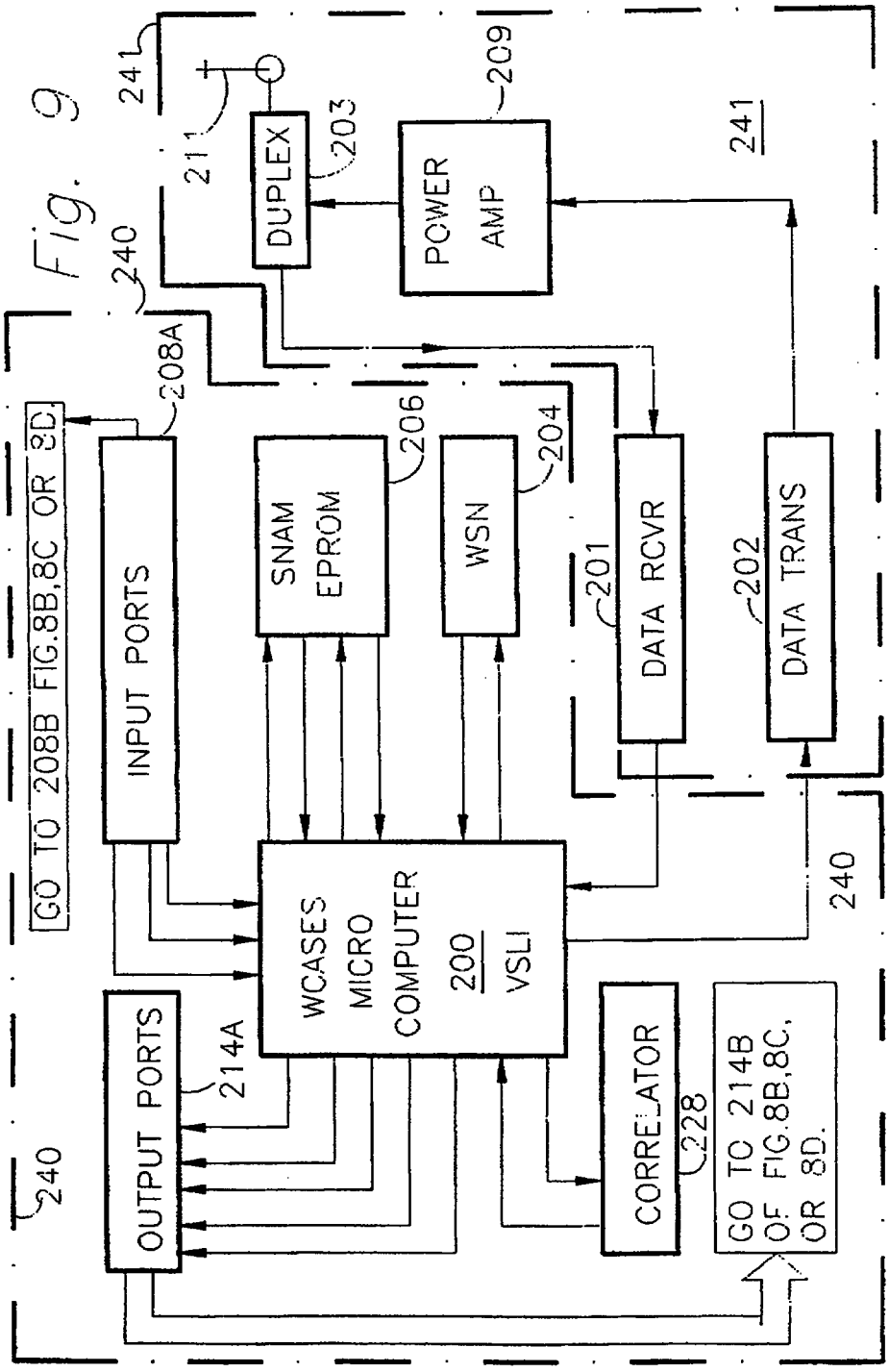

440
115
MCDB
427A
428A
429A
430A
432A
WN89036734
SID1553
GI163
1757771234
SSD547
433A
A2408479347868374729414014955
NAME: John Doe
ADDRESS:123 Elm Street
City; Anytown, USA.
Vehicle Make: Cadillac Seville STS.
VIN: 456GHBKG0986544476
WSN: 89036734
WIN: 175-777-1234
Alarm Type: Viper 600
SID: Home Sys. NYNEX CELLULAR/WCASES
Subscriber.
Status: Normal.
Location: 140LONG/181LAT.
Velocity: 55MPH
440

Fig. 8

Fig. 9


241
211
DUPLEX
203
POWER AMP
209
241
240
208A
GO TO 208B FIG.8B,8C OR 8D
INPUT PORTS
SNAM EPROM
206
WSN
204
DATA RCVR
201
DATA TRANS
202
WCASES MICRO COMPUTER 200 VSLI
240
OUTPUT PORTS
214A
240
CORRELATOR
228
GO TO 214B OF FIG.8B,8C, OR 8D.

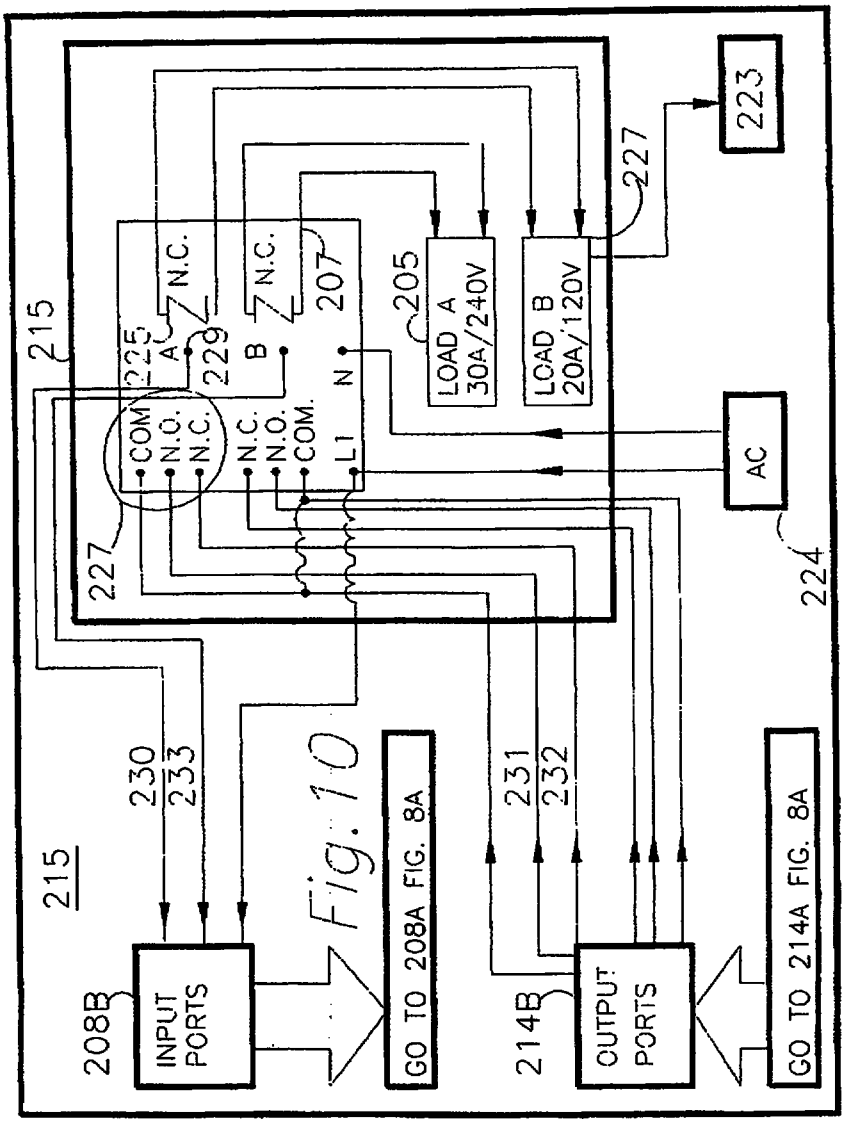

215
COM
N.O.
N.C.
N.C.
N.O.
COM.
L1
N
A
B
N.C.
N.C.
225
229
207
205
LOAD A
30A/240V
LOAD B
20A/120V
227
223
AC
224
227
230
233
231
232
215
208B
INPUT PORTS
GO TO 208A FIG. 8A
214B
OUTPUT PORTS
GO TO 214A FIG. 8A

Fig. 10

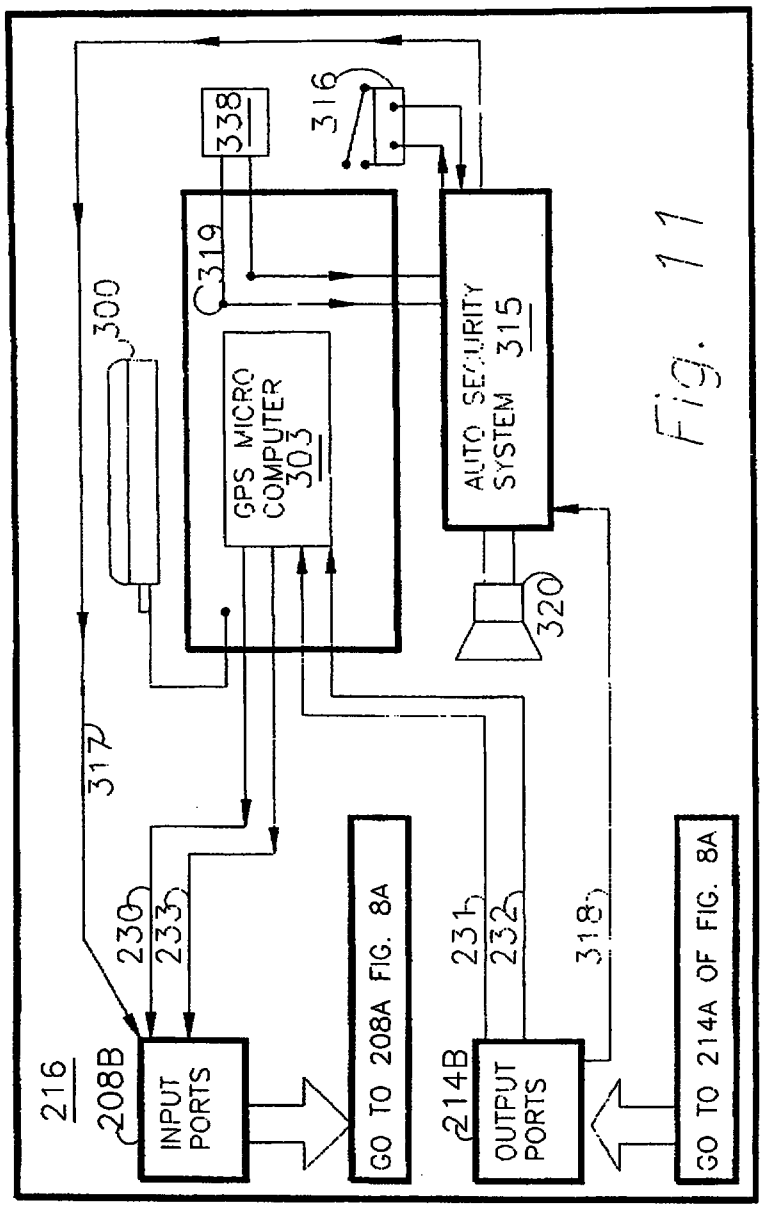

338
316
319
300
GPS MICRO COMPUTER 303
AUTO SECURITY SYSTEM 315
320
317
230
233
231
232
318
216
208B
INPUT PORTS
GO TO 208A FIG. 8A
214B
OUTPUT PORTS
GO TO 214A OF FIG. 8A

Fig. 11

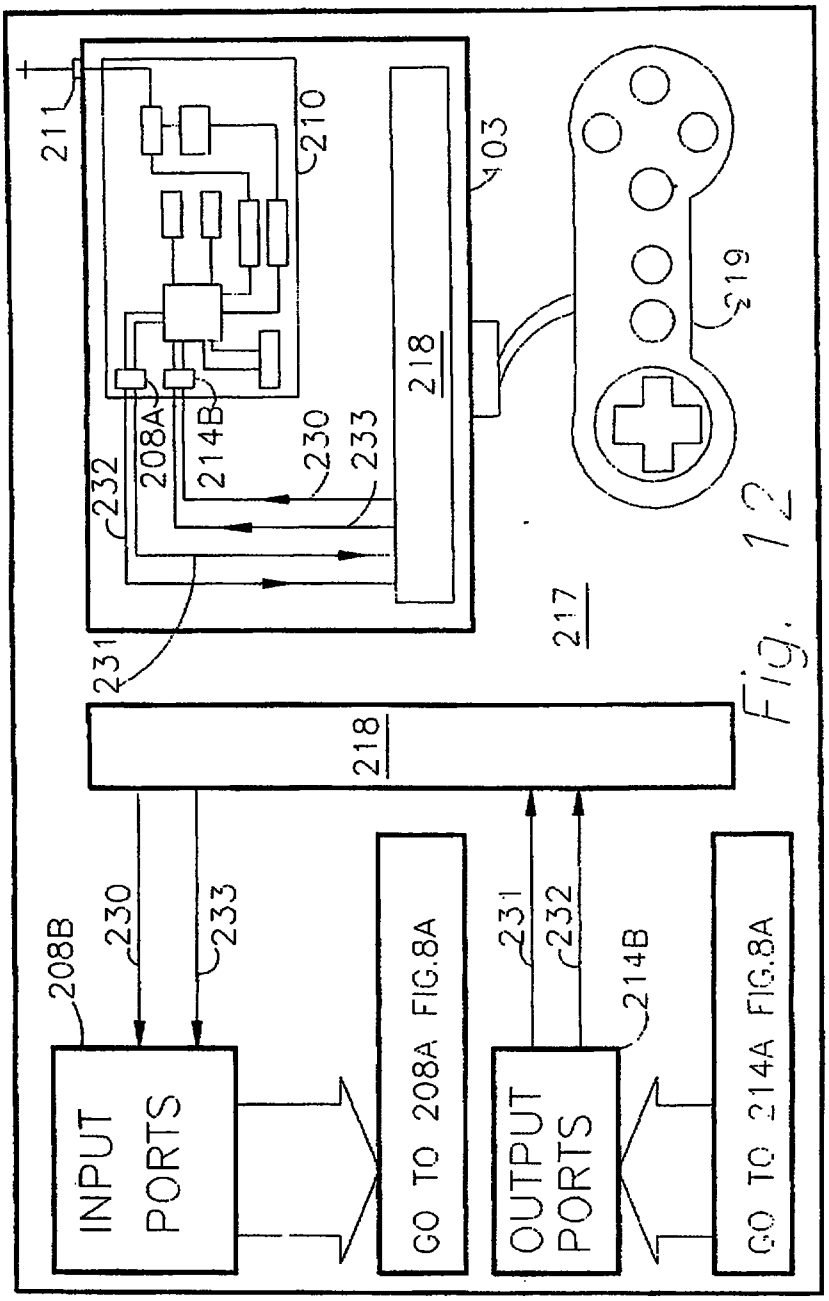
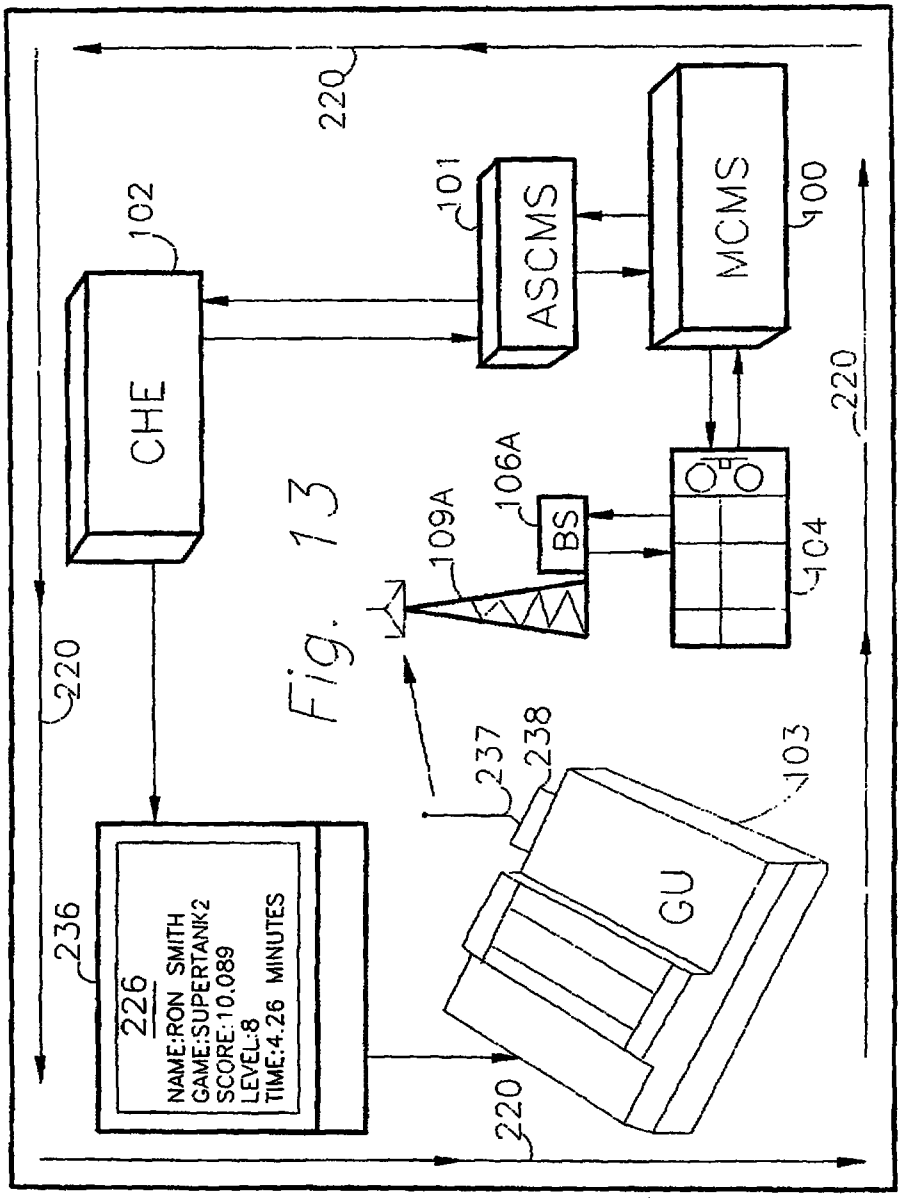

211
210
103
219
218
208A
214B
230
233
232
231
217
218
208B
230
233
231
232
214B
INPUT PORTS
GO TO 208A FIG.8A
OUTPUT PORTS
GO TO 214A FIG.8A

Fig. 12


220
101
ASCMS
MCMS
900
102
CHE
220
106A
BS
109A
104
220
Fig. 13
237
238
103
GU
236
226
NAME:RON SMITH
GAME:SUPERTANK2
SCORE:10,089
LEVEL:8
TIME:4.26 MINUTES
220

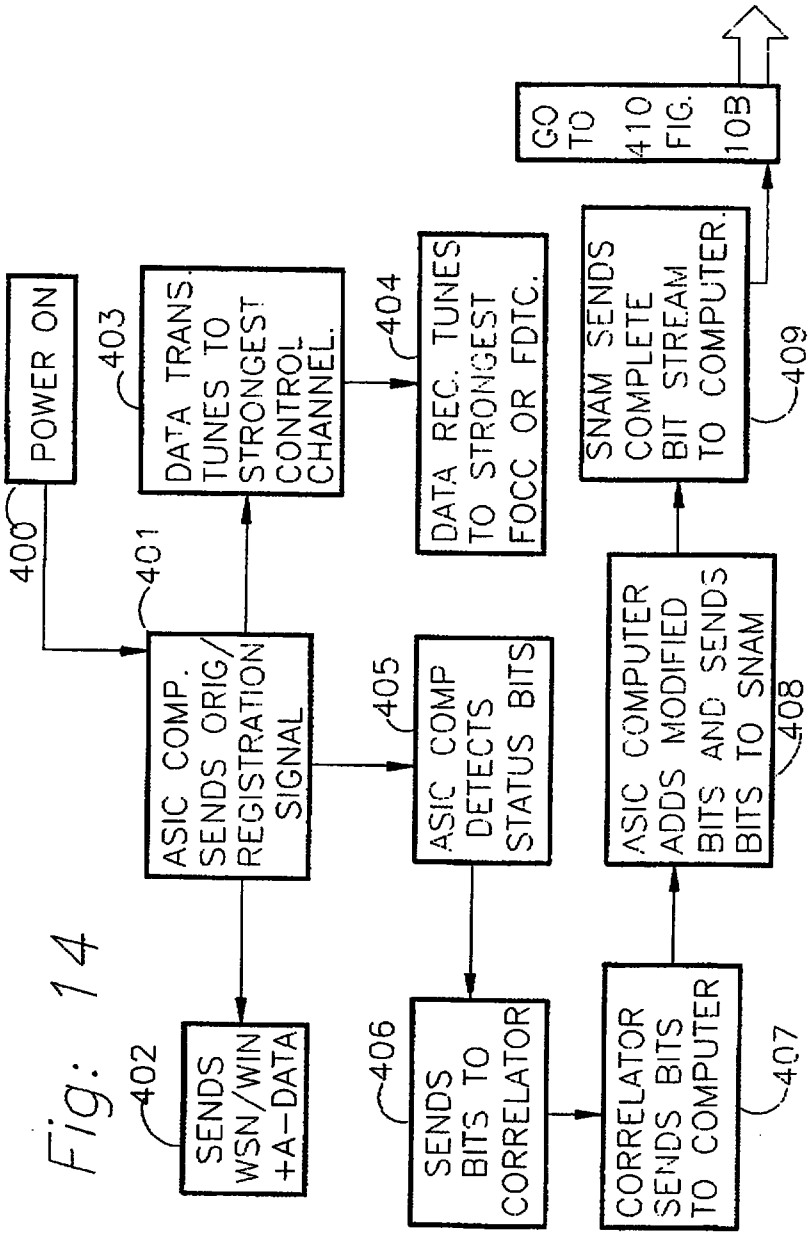

POWER ON
400
DATA TRANS. TUNES TO STRONGEST CONTROL CHANNEL.
403
DATA REC. TUNES TO STRONGEST FOCC OR FDTC.
404
SNAM SENDS COMPLETE BIT STREAM TO COMPUTER.
409
GO TO 410 FIG. 10B
ASIC COMP. SENDS ORIG/ REGISTRATION SIGNAL
401
ASIC COMP DETECTS STATUS BITS
405
ASIC COMPUTER ADDS MODIFIED BITS AND SENDS BITS TO SNAM
408
SENDS WSN/WIN +A-DATA
402
SENDS BITS TO CORRELATOR
406
CORRELATOR SENDS BITS TO COMPUTER
407

Fig: 14

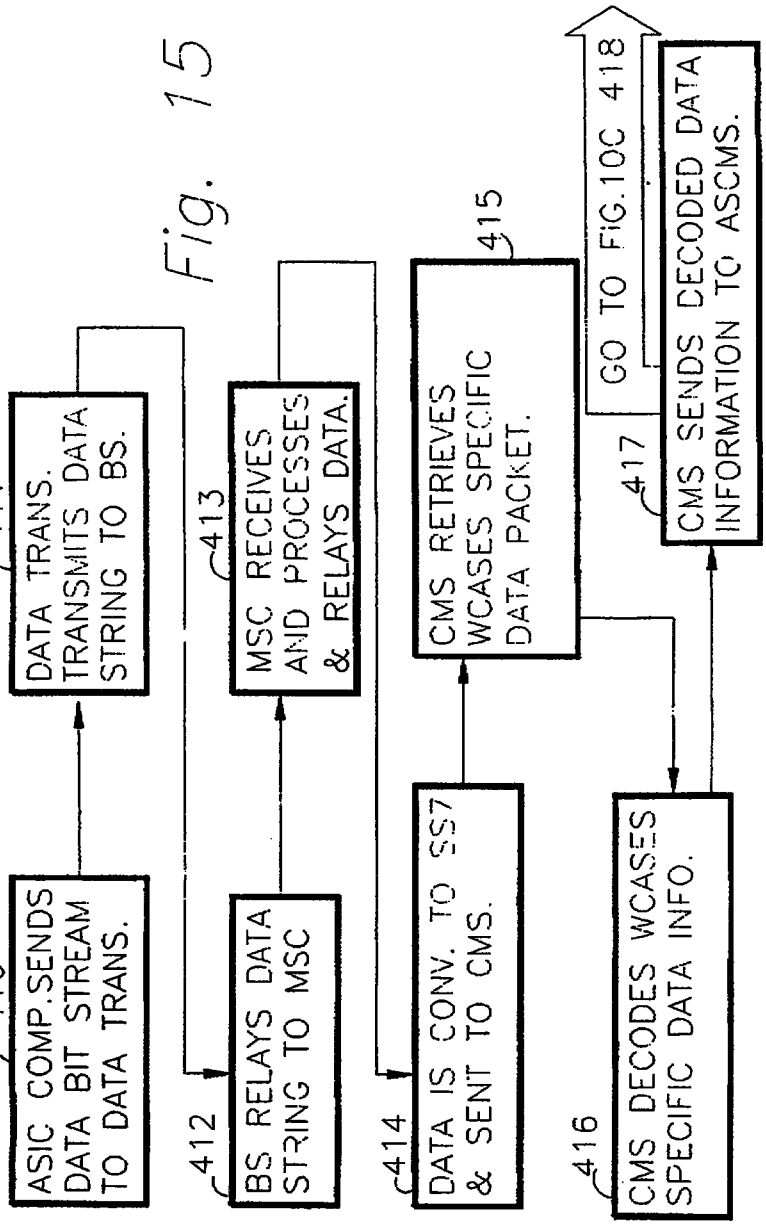

ASIC COMP. SENDS DATA BIT STREAM TO DATA TRANS.
410
DATA TRANS. TRANSMITS DATA STRING TO BS.
411
BS RELAYS DATA STRING TO MSC
412
MSC RECEIVES AND PROCESSES & RELAYS DATA.
413
DATA IS CONV. TO SS7 & SENT TO CMS.
414
CMS RETRIEVES WCASES SPECIFIC DATA PACKET.
415
CMS DECODES WCASES SPECIFIC DATA INFO.
416
CMS SENDS DECODED DATA INFORMATION TO ASCMS.
417
GO TO FIG.10C 418

Fig. 15

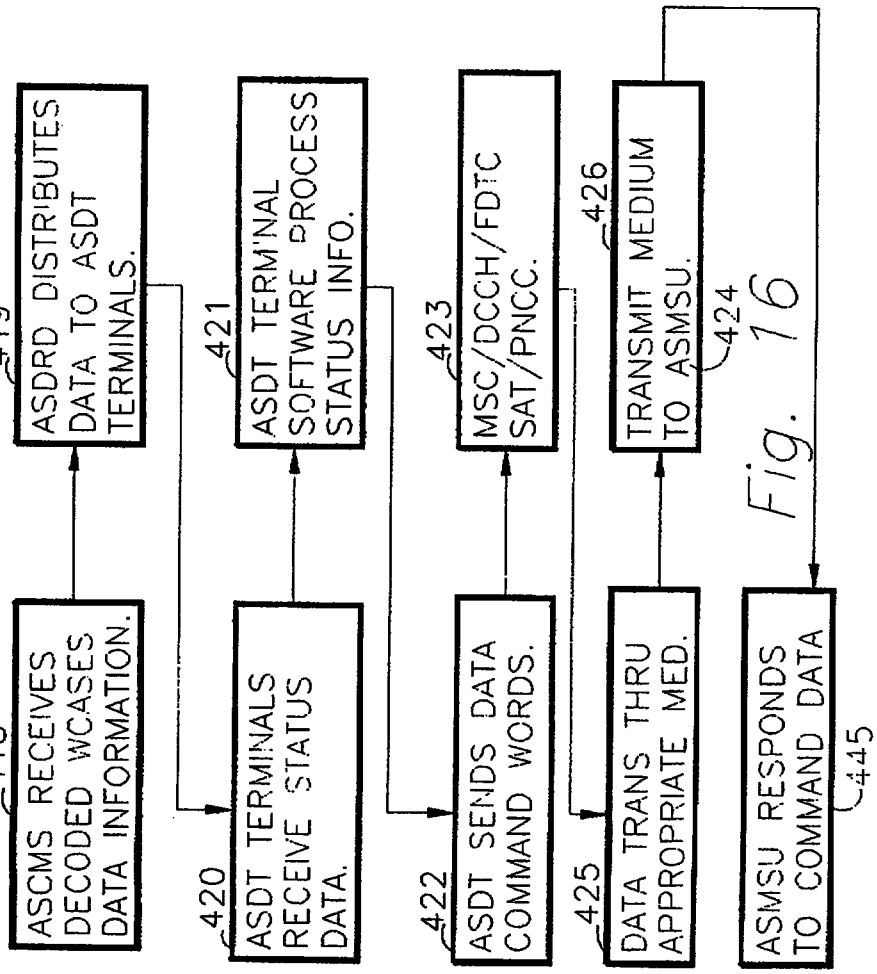

418
ASCMS RECEIVES DECODED WCASES DATA INFORMATION.
419
ASDRD DISTRIBUTES DATA TO ASDT TERMINALS.
420
ASDT TERMINALS RECEIVE STATUS DATA.
421
ASDT TERMINAL SOFTWARE PROCESS STATUS INFO.
422
ASDT SENDS DATA COMMAND WORDS.
423
MSC/DCCH/FDTC SAT/PNCC.
424
TRANSMIT MEDIUM TO ASMSU.
425
DATA TRANS THRU APPROPRIATE MED.
426
ASMSU RESPONDS TO COMMAND DATA
445

Fig. 16

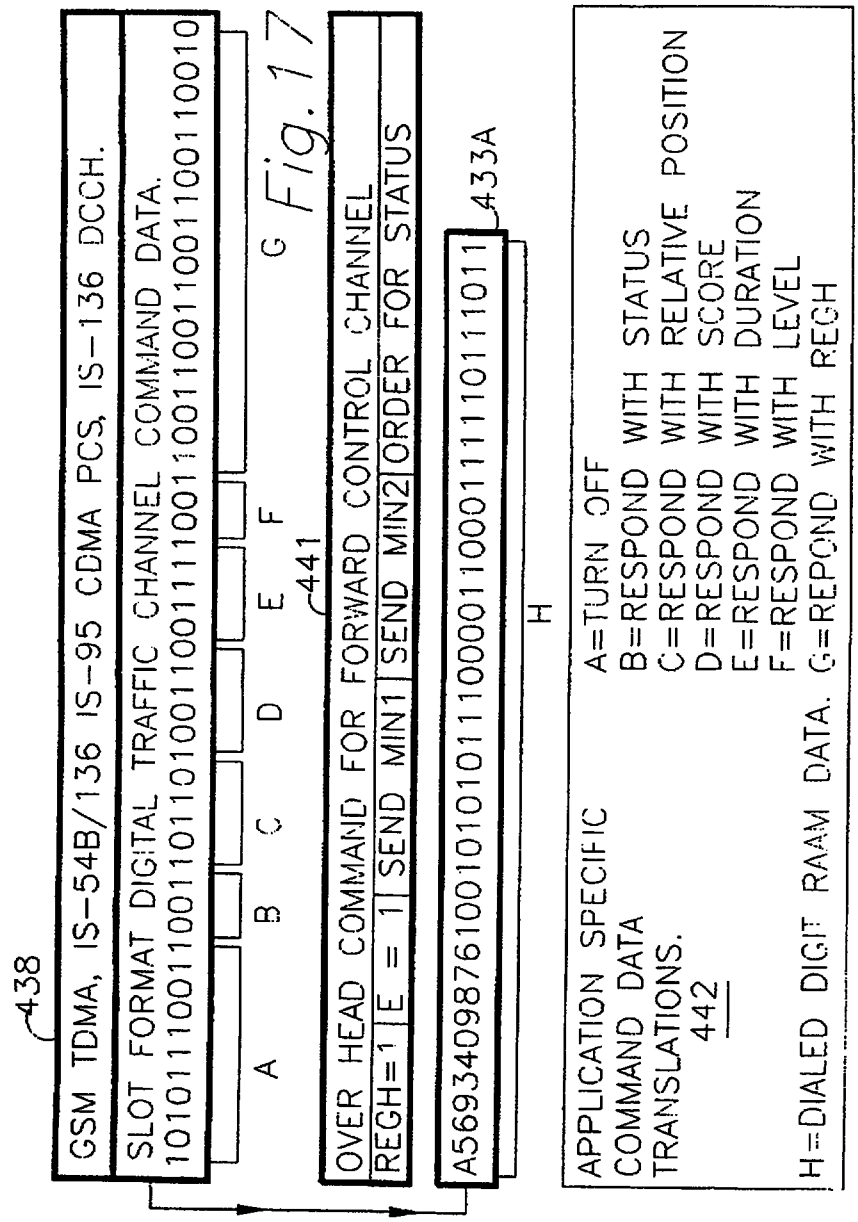
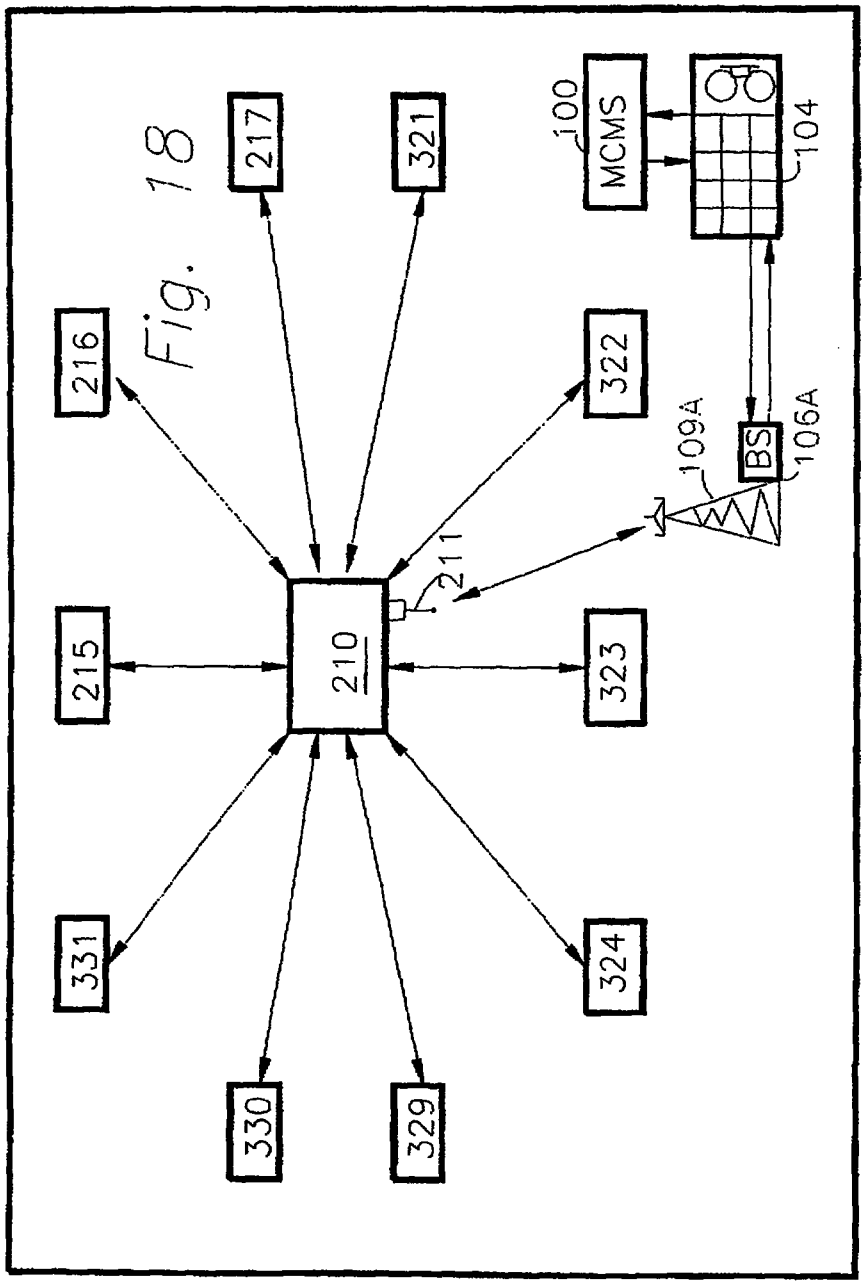

438
GSM TDMA, IS-54B/136 IS-95 CDMA PCS, IS-136 DCCH.
SLOT FORMAT DIGITAL TRAFFIC CHANNEL COMMAND DATA.
10101110011001101100111100110011001100110010
A B C D E F G
441
OVER HEAD COMMAND FOR FORWARD CONTROL CHANNEL
REGH=1 E = 1 SEND MIN1 SEND MIN2 ORDER FOR STATUS
A569340987610010101101110000110001111101111011
433A
H
APPLICATION SPECIFIC COMMAND DATA TRANSLATIONS.
442
A=TURN OFF
B=RESPOND WITH STATUS
C=RESPOND WITH RELATIVE POSITION
D=RESPOND WITH SCORE
E=RESPOND WITH DURATION
F=RESPOND WITH LEVEL
G=REPOND WITH REGH
H=DIALED DIGIT RAAM DATA.

Fig. 17


Fig. 18
217
321
100
MCMS
104
216
322
109A
BS
106A
211
210
215
323
331
324
330
329

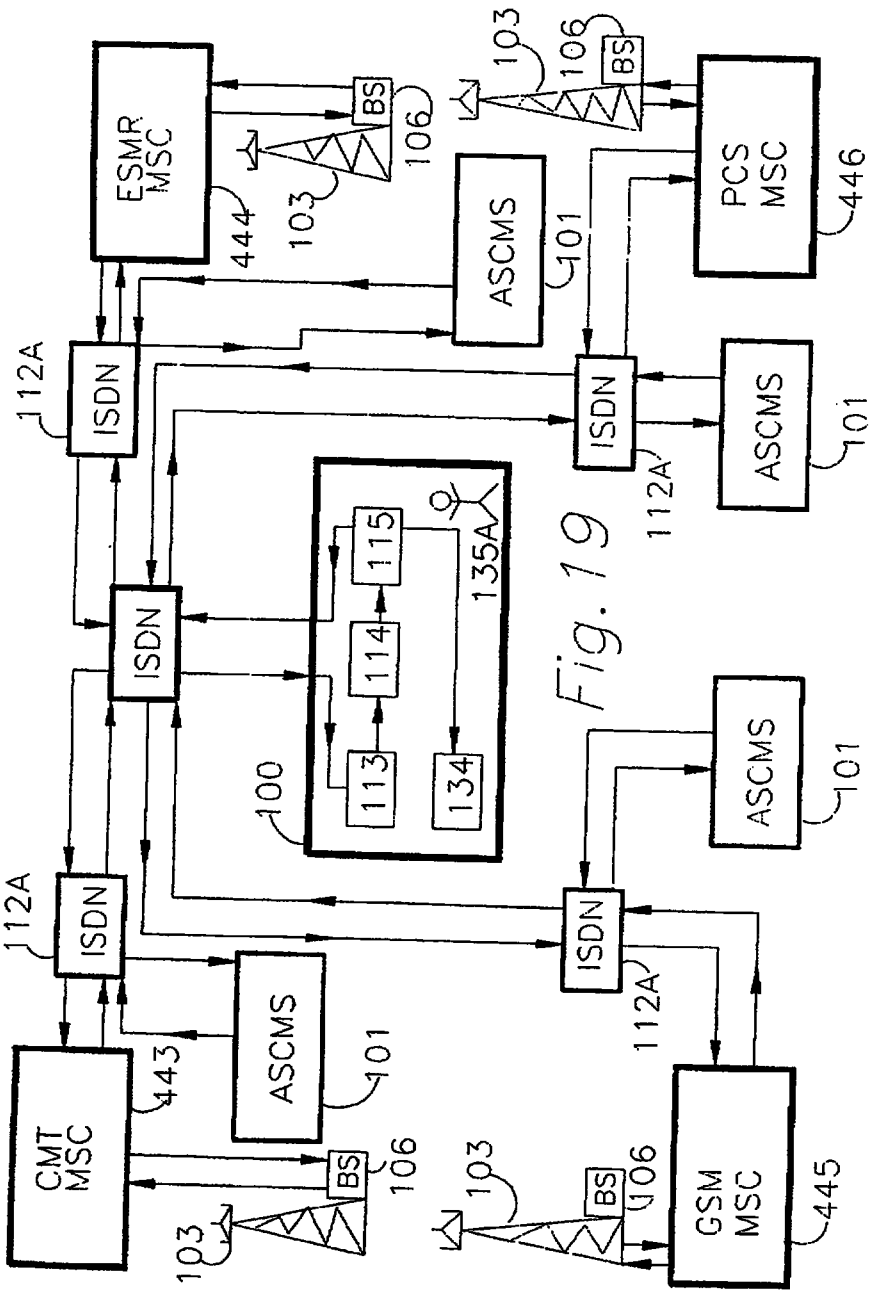

ESMR MSC
444
BS
106
103
ASCMS
101
PCS MSC
446
112A
ISDN
115
114
113
134
135A
100
CMT MSC
443
GSM MSC
445

Fig. 19

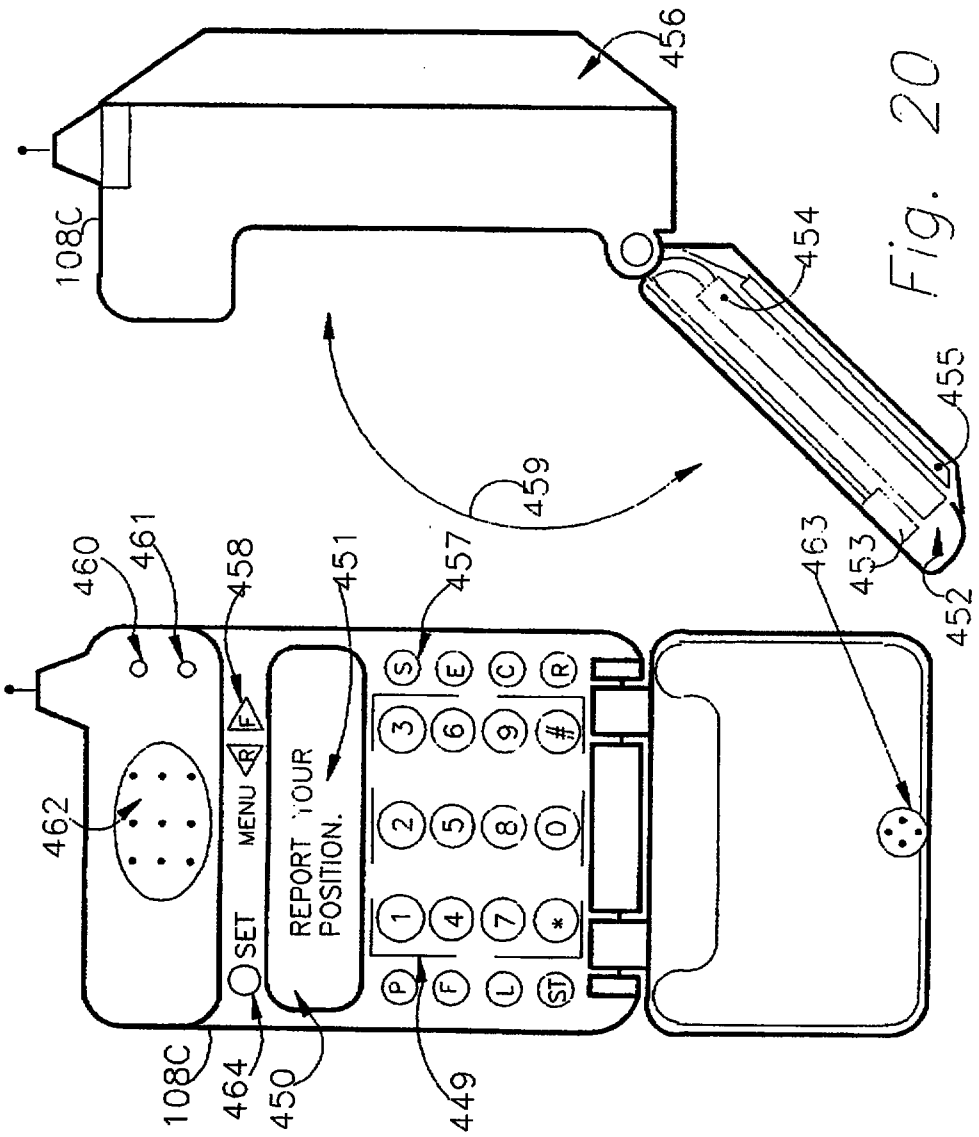

456
108C
454
455
459
460
461
458
451
457
463
453
452
462
MENU
SET
REPORT YOUR POSITION.
108C
464
450
449

Fig. 20

REPLACEMENT SHEETS SG
☐ Description : paged .... to paged ....
☑ Claim(s) : paged 1 to paged 6
☐ Drawing(s) : paged .... to paged ....
☐ Abstract : paged .... to paged
DATE OF RECEIPT 23 APR 1998

Claims

1. A method for communicating messages between a communicator and a central monitoring station over a telecommunications network that includes a voice channel and a control channel, wherein the voice channel conveys data messages and the control channel conveys control messages that manage access to and use of the voice channel, the method comprising the steps of:

a) obtaining a message at the communicator, the message comprising application specific data;

b) encoding the message in a sequence of digits associated with a control message to create an encoded message;

c) encoding a remote feature control request in the sequence of digits associated with the control message to invoke the forwarding of the sequence of digits, including the encoded message, by a local telecommunications switching center upon detecting the remote feature control request;

d) transmitting the control message and associated sequence of digits to the local telecommunications switching center over the control channel, bypassing the voice channel;

e) detecting the remote feature control request at the local telecommunications switching center;

f) forwarding the remote feature control request and the encoded message over a communications channel to the central monitoring station in response to detecting the remote feature control request; and

g) decoding the encoded message to retrieve the application specific data.

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2. The method of claim 1, wherein the step of obtaining a message at the communicator includes the steps of:

a) transmitting the message from a remote monitoring device to the communicator; and

b) receiving the message at the communicator.

3. The method of claim 2, wherein the remote monitoring device comprises an alarm system, and the step of receiving the message at the communicator comprises the step of receiving data specifying a status of an alarm system at the communicator.

4. The method of claim 2, wherein the remote monitoring device comprises a tracking system, and the step of receiving the message at the communicator comprises the step of receiving tracking data from the tracking system at the communicator.

5. The method of claim 2, wherein the remote monitoring device comprises a utility meter, and the step of receiving the message at the communicator comprises the step of receiving a reading from the utility meter at the communicator.

6. The method of claim 2, wherein the remote monitoring device is a two-way paging device, and the step of receiving a message at the communicator comprises the step of receiving a response to a page from a two-way paging device.

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7. The method of claim 1, wherein the step of encoding the message in a sequence of digits associated with a control message comprises the step of encoding the message in a sequence of digits associated with a call origination message.

8. The method of claim 7, wherein the step of encoding a remote feature control request in the sequence of digits associated with the control message to invoke the forwarding of the sequence of digits, including the encoded message, by a local telecommunications switching center upon detecting the remote feature control request, comprises encoding a remote feature control request in the sequence of digits associated with the call origination message to invoke the forwarding of the sequence of digits, including the encoded message, by the local telecommunications switching center upon detecting the remote feature control request.

9. The method of claim 8, wherein the step of transmitting the control message and the associated sequence of digits to a local telecommunications switching center over the control channel, bypassing the voice channel, comprises the step of transmitting the call origination message and the associated sequence of digits to a serving mobile switching center (MSC) in a cellular radio telecommunications network, over the control channel, bypassing the voice channel.

10. The method of claim 9, wherein the steps of detecting the remote feature control request at the local telecommunications switching center and forwarding the remote feature control request and the encoded message over a communications channel to the central monitoring station in response to detecting the remote feature control request comprises the steps of detecting the remote feature control request at the serving MSC

* C L M S *

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and forwarding the remote feature control request and the encoded message over at least one inter cellular serving area link between the serving MSC and the central monitoring station in response to detecting the remote feature control request.

11. The method of claim 10, wherein the inter cellular serving area link between the serving MSC and the central monitoring station operates according to the signaling system 7 (SS7) protocol standard.

12. A method for communicating messages between a communicator and a central monitoring station over a mobile satellite communications network that includes a voice channel and a control channel, wherein the voice channel conveys data messages and the control channel conveys control messages that manage access to and use of the voice channel, the method comprising the steps of:

a) obtaining a message at the communicator, the message comprising application specific data;

b) encoding the message in a sequence of digits associated with a control message to create an encoded message;

c) encoding a remote feature control request in the sequence of digits associated with the control message to invoke the forwarding of the sequence of digits, including the encoded message, by a local mobile satellite communications switching center upon detecting the remote feature control request;

d) transmitting the control message and associated sequence of digits to the local mobile satellite communications switching center over the control channel, bypassing the voice channel;



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e) detecting the remote feature control request at the local mobile satellite communications switching center;

f) forwarding the remote feature control request and the encoded message over a communications channel to the central monitoring station in response to detecting the remote feature control request; and

g) decoding the encoded message to retrieve the application specific data.

13. The method of claim 12, wherein the step of obtaining a message at the communicator includes the steps of:

a) transmitting the message from a remote monitoring device to the communicator; and

b) receiving the message at the communicator.

14. The method of claim 13, wherein the remote monitoring device comprises an alarm system, and the step of receiving the message at the communicator comprises the step of receiving data specifying a status of an alarm system at the communicator.

15. The method of claim 13, wherein the remote monitoring device comprises a tracking system, and the step of receiving the message at the communicator comprises the step of receiving tracking data from the tracking system at the communicator.

16. The method of claim 13, wherein the remote monitoring device comprises a utility meter, and the step of receiving the message at the communicator comprises the step of receiving a reading from the utility meter at the communicator.

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17. The method of claim 13, wherein the remote monitoring device is a two-way paging device, and the step of receiving a message at the communicator comprises the step of receiving a response to a page from a two-way paging device.

18. The method of claim 12, wherein the step of encoding the message in a sequence of digits associated with a control message comprises the step of encoding the message in a sequence of digits associated with a call origination message.

19. The method of claim 18, wherein the step of encoding a remote feature control request in the sequence of digits associated with the control message to invoke the forwarding of the sequence of digits, including the encoded message, by a local mobile satellite communications switching center upon detecting the remote feature control request, comprises encoding a remote feature control request in the sequence of digits associated with the call origination message to invoke the forwarding of the sequence of digits, including the encoded message, by the local mobile satellite communications switching center upon detecting the remote feature control request.



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