



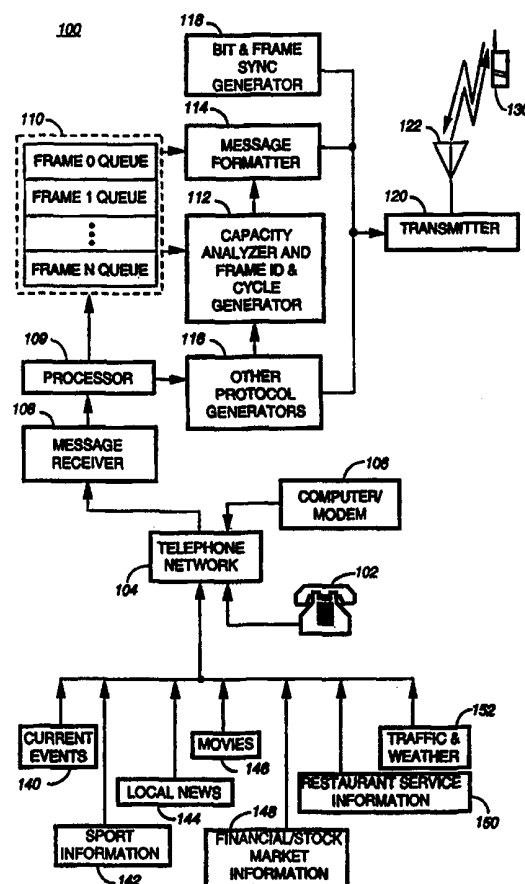
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US98/22892 (22) International Filing Date: 27 October 1998 (27.10.98) (30) Priority Data: 08/966,330                7 November 1997 (07.11.97)        US (71) Applicant: MOTOROLA INC. [US/US]; 1303 East Algonquin Road, Schaumburg, IL 60196 (US). (72) Inventors: MORSE, Gary, James; 5599 Coastal Drive, Boca Raton, FL 33487 (US). NELMS, Robert, Nathan; 7236 Burgess Drive, Lake Worth, FL 33467 (US). (74) Agents: NICHOLS, Daniel, K. et al.; Motorola Inc., Intellectual Property Dept., 1500 Gateway Boulevard/MS96, Boynton Beach, FL 33426 (US).			(81) Designated States: AU, BR, CA, CN, KR, MX, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: SELECTIVE CALL MESSAGE DISPLAY FORMAT CONTROL

## (57) Abstract

A selective call messaging device (130) includes a presentation manager (502, 504, 602, 604) that presents a formatted message on an information display (228) as determined by intrinsic presentation capabilities of the selective call messaging device (130) either dependent on or independent form any formatting information contained in the formatted message.



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**SELECTIVE CALL MESSAGE DISPLAY FORMAT CONTROL****Field of the Invention**

5           This invention relates in general to wireless messaging and more particularly to consistently formatting messages received by a wireless messaging receiver.

**Background of the Invention**

10

A conventional selective call messaging device, e.g., a receiver and/or transmitter, often can receive messages from more than one sources. Sources are distinguished from each other typically by an address information associated with each message. When the address information correlates, or matches, a predetermined address in the selective call messaging device, the selective call messaging device receives and stores the message from a particular information source.

15           Modern selective call services or service providers are capable of sending multiple types of data including information services, for example, stock market, weather, sports, news or other information, periodically to a subscribing selective call messaging device (receiver or transceiver). Before long, hundreds of information services are likely to be broadcast to selective call messaging devices. Because service providers may pre-format the information into a specific format, e.g., either right of left justified or in aligned columns, a problem results if one selective call messaging device presents this information differently from another due to differing display characteristics such as pixel density, the number of horizontal character cells, or vertical lines.

20           Thus, what is needed is an apparatus that allows messages received from personal sources or information services to be received and presented in a consistent fashion across a number of selective call messaging devices, allowing all users to view messages as intended by the information provider.

### Brief Description of the Drawings

FIG. 1 is an electrical block diagram of a selective call system for providing information services in accordance with a preferred embodiment of the present invention.

FIGS. 2-4 are timing diagrams illustrating the transmission format of an interleaved information signaling protocol utilized by the selective call system of FIG. 1 in accordance with the preferred embodiment of the present invention.

FIG. 5 illustrates a first message format processing procedure in accordance with the present invention.

FIG. 6 illustrates a message format processing procedure in accordance with the preferred embodiment of the present invention.

FIG. 7 is a block diagram of a selective call messaging device for use in accordance with a preferred embodiment of the present invention.

### Description of a Preferred Embodiment

FIG. 1 shows an electrical block diagram of a selective call system (or radio frequency communication system) for generating and transmitting (or broadcasting) a selective call signal (or communication signal) including either personal messages or a plurality of information services in accordance with a preferred embodiment of the present invention. The functions of the selective call system **100** are preferably implemented within software, for example within a MODAX™ 500 Selective Call Terminal which is manufactured by Motorola Inc. Typically, a subscriber can send a message by using a telephone **102** to initiate a transmission of a selective call message. As is well known, the telephone **102** couples to the selective call system **100**, in particularly a base station or base site via a telephone network **104**, the operation of which is well known to one of ordinary skill in the art. Similarly, a computer/modem **106** is also coupled to the telephone network **104** to enter information, for example alphanumeric or numeric messages. The telephone network **104** couples to a message

receiver **108** which receives the messages to be transmitted (broadcast) to at least one of a plurality of selective call messaging devices **130** typically from the public switched telephone network **104**.

5       According to an alternate embodiment, a plurality of information services **140-152** are coupled to the telephone interface network which is coupled to a processor **109** via the message receiver **108**. Those skilled in the art will appreciate that the plurality of information service providers  
10   **140-152** can be received as radio frequency signal by an antenna **202**.

      When the base site processor (encoder) **109** receives information which is periodically transmitted as updates, the information is encoded as a message in the form of a selective  
15   call signal (or communication signal). Specifically, the processor **109**, coupled to the message receiver **108**, determines an appropriate protocol, preferably, the FLEX™ protocol, and address to encode the information service. If the processor **109** determines that the message is to be sent  
20   via another signal format, it is passed to one of another protocol generator **116** which can include other protocol generators well known to one of ordinary skill in the art. When the processor has determined that the information services and any messages are to be transmitted on the FLEX™  
25   protocol, the information is encoded and stored in a frame queue buffer **110** which has queues (FRAME 0-N QUEUES) for the corresponding frames of the signal, and in this example of the present invention, the corresponding number of frames N is 128. The predetermined frame identification (ID) of the  
30   selective call messaging device **130** corresponding to the message is determined and the message is stored in the corresponding frame queue. A capacity analyzer and frame ID/cycle generator **112** determine the sequence of frame IDs to be transmitted and analyze the capacity of each frame to  
35   determine the cycle value to be used. The capacity analyzer **112** is also responsive to other protocols being transmitted. For example, if the expected occurrence of a frame is to be replaced by the transmission of one of the other protocols (thereby diminishing the capacity of the frame), the capacity

analyzer **112** can account for this with the determined cycle value. A bit and frame sync generator **118** synchronously generates bit and frame synchronization signals. A message formatter **114** determines, in response to the address of  
5 selective call messaging devices **130** and the frame queue, the frame which the information is to be included, and a respective message formatting width in display units. The messages are then formatted for transmission. A transmitter  
10 **120** accepts signals from blocks **118**, **114** and **116** and modulates and transmits radio frequency selective call signals to selective call messaging devices **130** via antenna **122** in a manner well known to those of ordinary skill in the art.

Referring to FIGs. 2-4, timing diagrams of a signaling protocol in accordance with the preferred protocol for  
15 selective call messages are shown according to FIG. 1. Referring to FIG. 2, the selective call protocol is encoded, preferably according to the FLEX™ protocol, in a number of, preferably one-hundred-twenty-eight (128), message packets or frames **200**. Each frame **200** is preferably 1.875 seconds in  
20 duration and has a preferred base data rate of 6400 bits per second. Although, it will be appreciated that other data rates can be used including the ability to use multiple data rates.

Referring to FIG. 3, each frame is comprised of a bit  
25 sync signal **302**, preferably 32 bits of alternating 1,0 patterns, followed by a FRAME SYNC #1 signal **304** preferably having a predetermined thirty-two bit words and its thirty-two bit inverse, and a FRAME INFO signal **306**, preferably one  
30 thirty-two bit word having twenty-one variable information bits containing information such as a cycle number and a frame number. The BIT SYNC signal **302** provides bit synchronization to the selective call messaging device(s) **130** while the FRAME SYNC #1 signal **304** provides frame synchronization and includes a signal indicative of the data rate of the message  
35 information.

Following the FRAME INFO word **306** is a FRAME SYNC #2 **308**. Following the FRAME SYNC #2 **308** is a block info word signal **310** including information such as the number of priority addresses, end of block information field, and vector

start field. The code word of each frames **200** is preferably encoded as 31,21 Bose-Chaudhuri-Hocquenghem (BCH) code words having twenty-one information bits and ten parity bits generated according to the well known BCH algorithm. An  
5 additional even parity bit extends the word to a 32,21 code word. The addresses are located in block **312** and the vectors pointing to the messages are located in block **314** and the messages are located in the remaining blocks **316**. Generally, all of the address signals within the frame are located in a  
10 first portion **312** and the information or message signals are located in a subsequent portion of the block **316**. It is well known to those skilled in the art how to locate addresses **312** in a first portion and message information **316** in a second portion of the frame **200**. The addresses **312** may be located  
15 at the beginning, end, or anywhere in the frame **200**, so long as the selective call messaging device **130** can recover and properly decode the addresses which indicates selection of the selective call messaging device **130**. Preferably, the addresses are located at the beginning of the frame **200** so the  
20 selective call messaging device can, at the earliest opportunity, determine whether its address is present in the protocol frame being examined. This allows the selective call messaging device's address correlator **214** and decoder **212** to remain on only long enough to determine selection, or when  
25 selected, decode the incoming selective call message.

Words **310-316** are shown in a vertical orientation to indicate that these words may be interleaved in order to improve the immunity of the transmission to burst errors. It is understood by one of ordinary skill in the art that  
30 interleaving may be modified or eliminated.

Referring to FIG. 4, the message information words **316** are illustrated in more detail according to the preferred embodiment of the present invention.

The timing diagram further explodes the block **316**  
35 containing the address and selective call message **402**. The selective call message **402** comprises numeric **404** and/or alphanumeric **406** characters, as well as device dependent control elements **408**. Additional selective call messages **410** may follow in sequence, as in a conventional selective call

signalling system. The device dependent control elements may be conventional American Standard Code for Information Interchange (ASCII) characters such as a carriage return symbol, a line feed symbol, a form feed symbol, a back space symbol, or the like. Alternatively, the device dependent control elements **408** may be unique combinations of non-printable ASCII characters representing special presentation functions such as clear screen, inverse character background contrast presentation, blinking character background contrast presentation, foreground and background color selection, an audible or tactile event (e.g., a beep, tone, vibration, or sequence thereof) or other sensory enhancing features embodied in a particular selective call messaging device. One of ordinary skill in the art will realize that any combination of bits not reserved for printable ASCII characters may be selected as device dependent control elements **408**, and that common "ESCAPE" sequences may be used that include printable ASCII characters which are interpreted as a control sequence for extended presentation of information by a selective call messaging device **130**. By embedding these device dependent control elements within the selective call message instead of transmitting them separately, system efficiency is improved. Accordingly, each selective call message may have a unique format.

At the selective call messaging device **130**, the controller **210** operates to decode only those device dependent control elements **408** which it can present. In an information services broadcast system, this feature permits a service provider to pre-format information at a processing location only once, and generate a corresponding selective call message **402**, **410** that is sent to all selected subscribers. Since the selective call messaging device uses the device dependent control elements **408** to present a received message with respect to the display capability of the particular selective call messaging device, all selective call messaging devices can present the received message in a manner that substantially resembles the format intended by the information service provider. Alternatively, the received message may be presented in a format that best uses the limited capabilities



of a particular selective call messaging device **130** that may not have a display **228** which is fully capable of presenting the message as intended by the service provider. Instances of the preceding cases will be illustrated in the following  
5 figures.

Referring to FIG. 5, the illustration shows a message format processing procedure in accordance with the present invention.

By way of example, consider an information feed from an  
10 information service provider such as the Associated Press™, Cable News Network™ or the New York Stock Exchange™. These information feeds may contain preset formatting which is not simply free form text (for example tables or information meant to fit on exactly one screen). To correctly present the  
15 information, conventional wireless selective call messaging devices need to specially format the information for each type of selective call messaging device. If this information is received by another selective call messaging device that has different display capabilities and different formatting rules,  
20 the information will not appear correctly and in most cases would require totally new broadcast to make the data of interest appear correctly.

Consider two different devices with different display capabilities and controls as follows.

25 Device 1 - Display Capabilities: text only; screen width 20 characters; screen height 4 lines; font capabilities: single monospaced font, one color, one size, and one style; display control characters: line feed and carriage return; and display rules: word wrapping based on whole words, and first  
30 space removal in line.

Device 2 - Display Capabilities: text and graphics; screen width 26 characters; screen height 8 lines; font capabilities: multiple fonts (proportional, non proportional), multi-color, multi-size, and multi-style; display control  
35 characters: line feed and carriage return, shift control, control sequence for font selection and options, placement controls for graphics.

From this list of display capabilities, one can determine that an information broadcast which contains information

formatted for device 2 will be not be correctly presented by device 1. Thus, in a conventional system, the information must be re-formatted and resent in a separate format to accommodate the display capabilities of device 1.

5       A very simple example of differing device capabilities is that some devices interpret a carriage return <CR> line feed <LF> pair as a single carriage return and line feed where the next text appears on the following line. However, other devices interpret either character <CR> or <LF> to mean both  
10 <CR> and <LF>. In this case if the device sees both of these characters together the next text appears to skip a line before starting again. This creates an intolerable display formatting problem because of the extra line inserted after each <CR> or <LF> received and interpreted.

15       Another problem arises when considering the presentation of information formatted for a 26 column display on a 20 column display. In this case, word-wrapping causes the data to be presented in a format other than that intended by the service provider. Consider the example where financial  
20 information is pre-formatted, and you would like to present this information consistently on two or more different devices. In this example, Table 1 shows information formatted for a 26 column display.

25

Position	12345678901234567890123456
Information	IBM 158 1/8 +11 +6.2%
	MSFT 114 1/2 -1/4 -0.2%
	MOT 58 1/8 +1/2 +1.4%

**Table 1**

Table 2 shows information formatted for a 26 column wide display as it would be presented on a 20 column wide display.

Position	12345678901234567890
Information	IBM 158 1/8 +11 +6 .2%MSFT 114 1/2 -1/4 -0.2%MOT 58 1/8 + 1/2 +1.4%

5

**Table 2**

This invention provides a method for solving this presentation problem by optimizing the display format of messages across a range of display capabilities. Using a display format control method there are several ways this same information could be made to fit.

This invention comprises two possible methods which employ a command or control character structure that allows a range of different devices to process incoming information in a device dependent manner. The end result is that a single formatted message can be correctly interpreted by a diverse range of selective call messaging devices having a range of display capabilities, and the incoming data is presented in a manner which is best suited for a particular device.

FIG. 5 shows a formatting process **502** comprising a set of rules **504** that are applied to an incoming message **506**. In this case, the incoming message **506** contains numeric, alphanumeric, and other printable and non printable characters such as spaces, <CR>, or <LF>. A selective call messaging device decodes the incoming message **506** and presents the incoming message **506** according to the display capability of a particular selective call messaging device **508**, **510**, **512**, **514**. As can be seen, a first display **508** introduces hard line breaks into the presentation, thus making the resulting message hard to read. This is due to the fact that the first display **508** is only 16 character cells wide. However, when the incoming message **506** is presented on a second **510**, third **512**, and fourth **514** display, the message is displayed as intended by the service or information provider. Correct presentation is due to the fact that the second **510**, third **512**, and fourth **514** displays have enough horizontal character

cells to allow proper presentation on the incoming message  
**506**. Accordingly, when an incoming message is received that  
 includes less characters than the display width, and each  
 selective call messaging device consistently treats special  
 5 characters such as <CR> and <LF>, the incoming message will be  
 correctly displayed.

Referring to FIG. 6, the illustration shows a second  
 message format processing procedure in accordance with the  
 preferred embodiment of the present invention.

10 In FIG. 6, the incoming message **606** includes special  
 characters embedded in the message. Table 3 gives examples of  
 specific characters that might be used, and their meanings to  
 specific selective call messaging devices.

15

Device type	Control character	Meaning
All	(CR)	Carriage return - common to all
20 column devices	$\Delta$	Carriage return - 20 column devices only
20 column devices	$\Omega$	Truncate characters to next (LF) or (CR) 20 column devices only.

**Table 3**

By embedding these special characters, all conforming  
 20 selective call messaging devices can receive the same incoming  
 message **606**, and each selective call messaging device will  
 format the information differently depending on a device  
 specific interpretation of the special characters. A rule set  
**604** is used by each device to implement a special character  
 25 formatting process **602** that results in the incoming message  
**606** being presented on the first **508**, second **510**, third **512**,  
 and fourth **514** display. Notice that in the example shown in  
 FIG. 6, the special characters are acted on by the appropriate  
 device, but not displayed by any of the devices.

30 The displays shown in FIGs. 5 and 6 are typical of a  
 standard alphanumeric information display for use with the  
 selective call messaging device. Each of the first **508**,  
 second **510**, third **512**, and fourth **514** display devices shows  
 presentation examples of the incoming message **506**, **606**

including stock market information. The actual message may be any number of lines, some of which are not immediately presented on the display, but maintained in message memory **226** as shown in FIG. 7. Note that the ticker symbols, e.g., IBM, MSFT, MOT, are left aligned, while the stock prices are right aligned, the trend indicators are left aligned, and the percent change is right aligned. If every display had the same number of horizontal character elements, and the characters or symbols were monospaced, then all messages could be presented in the same format on such displays without requiring special formatting. However, this is not the case as selective call messaging devices have many different display types and capabilities. Accordingly, without the present invention, selective call messaging devices will and do present formatted data in dissimilar formats, with some devices presenting information that is completely unreadable because of unwanted line breaks caused by incorrectly interpreting special or control characters.

Referring to FIG. 7, the block diagram illustrates a selective call messaging device for use in accordance with a preferred embodiment of the present invention.

In the preferred embodiment, the selective call messaging device comprises **130** a controller **210** such as a microcomputer manufactured by Motorola, Inc., e.g., a 68HC11K4 or MC68HC11PH8 or the like, which includes or is coupled to a signal processor that performs the functions of a decoder which is normally implemented in both hardware and software. The signal processor may include an address correlator **214** and a decoder **212**, both of which operate using methods and techniques known to those skilled in the art. The address correlator **214** checks the recovered information signal from the output of a demodulator **206** for address information and correlates a recovered address with one of a plurality of predetermined addresses that are stored in the selective call messaging device's non-volatile memory **220**. After the address correlator **214** determines that the received signal is directed to the selective call messaging device **130**, e.g., by correlating the address in the received signal **312** to one of the predetermined addresses in the memory **220**, the decoder

**212** continues to decode the signal for the message field(s) **316** to determine if the message contains information to be presented by the selective call messaging device.

When the user of the selective call messaging device **130**  
5 has subscribed to at least one information service, the memory **220** is programmed, e.g., via over-the-air techniques or other appropriate methods of programming, with the subscribed information service addresses.

After receiving via antenna **202**, decoding, and storing a  
10 received selective call message or a selected information service message, the selective call messaging device **130** typically presents at least a portion of the stored message to a user, such as by a display **228** such as the first **508**, second **510**, third **512**, or fourth **514** displays mentioned in  
15 FIGs. 5 and 6. Preferably, the display is a liquid crystal display. Additionally, along with receiving, decoding, and storing the information, an alert may be presented to the user via an output annunciator **232**. The alert can include an audible alert, a visual alert, a vibratory or silent alert, or  
20 a combination of the aforementioned alerts, using known methods and techniques.

A support circuit **224** preferably comprises a conventional signal multiplexing integrated circuit, a voltage regulator and control mechanism, a current regulator and control  
25 mechanism, audio power amplifier circuitry, control interface circuitry, and display illumination circuitry. These elements are arranged to provide support for the functions of the selective call messaging device **130** as requested by a user.

Additionally, the controller **210** determines whether to  
30 conserve power upon detection or absence of specific address information. That is, when a received and recovered address correlates with a predetermined address in the non-volatile memory **220**, the controller checks the information corresponding to the correlated predetermined address to  
35 determine whether that address is enabled. If the controller **210** determines that the correlated predetermined address is not enabled then the decoder **212** is not enabled. Further, the controller instructs a battery saver **218** to begin conserving the power of the selective call messaging device **130**. The

battery saver signals the support circuit **224** to enter a low power mode (battery save mode) in which battery **234** power is selectively coupled and decoupled to certain circuits. A number of power consuming circuits may be directed to a low power or standby mode of operation. Additionally, the signal from the battery saver signals, or strobes, the receiver circuitry **204** to a low power mode to conserve power.

In this way, when a correlated address is not enabled, the selective call messaging device **130** conserves power immediately. Of course, the battery saver will re-enable the receiver **204** and other circuits at some later time. Methods of power conservation strobing in selective call messaging devices are known to those skilled in the art. Further, the controller inhibits any alerts to the user via the output annunciator. By not alerting again, power conservation is maximized. The information corresponding to each predetermined address stored in the memory **220** allows the controller to disable functions in the selective call messaging device **130**, and to conserve power when a correlated address is disabled, e.g., when no information service is selected for the address port. Input controls **230** are coupled to a memory **222** and a user interface **216** for receiving user inputs, including but not limited to programming, manipulating data and sending commands to the selective call messaging device **130**.

In summary, an encoder generates a selective call signal comprising the address corresponding with the selective call messaging device and a formatted message. A transmitter **120** then broadcasts the selective call signal to at least one of a plurality of selective call messaging devices **130**.

The selective call messaging device **130** uses a receiver to receive the selective call signal. The processor correlates the recovered address with the predetermined address stored in the selective call messaging device, and determines selection of the device. The decoder operates to decode the formatted message in response to the processor determining selection of the selective messaging call device.

The selective call messaging device **130** includes a presentation manager **502**, **504**, **602**, **604** that operates in one

of two modes. In a first mode, the selective call messaging device **130** operates to present the formatted message on the information display **228** as determined by intrinsic presentation capabilities of the selective call messaging device **130** independent from any formatting information contained in the formatted message. In the second mode, the selective call messaging device **130** operates to present the formatted message on an information display **228** as determined by intrinsic presentation capabilities of the selective call messaging device in conjunction with formatting information contained in the formatted message. The formatted message may comprise numeric, alphanumeric, and control characters ordered such that any device receiving the formatted message can either operate in accordance with the information contained in the message or ignore that portion of the information relating to non-printable or non-displayable characters, as in the ASCII character set or the like.

The presentation manager **502, 504, 602, 604** from FIGs. 5 and 6 comprises a set of text presentation rules based on the intrinsic presentation capabilities of the selective call messaging device. By way of example, a first rule of the set of text presentation rules is to interpret an isolated carriage return character as a carriage return - line feed command pair, a second rule of the set of text presentation rules is to interpret an isolated line feed character as a carriage return - line feed command pair, and a third rule of the set of text presentation rules is to interpret a horizontal tab character as a command to skip a number of horizontal character cells. This rule set can be extended to accommodate situations requiring the effective presentation of textual or graphical messages on display devices having less capability than the information content of the message. As an example, a graphical message transmitted in color would be converted to a dithered black and white image for presentation on a monochromatic display device. Similarly, a message containing text originally formatted in a proportional font would be rendered in a monospaced font on a display device having only monospaced presentation capability. These device dependent attributes are referred to as intrinsic presentation



capabilities. Further examples of intrinsic presentation capabilities are devices that present a message with proportionally spaced characters or tabular column alignment of characters.

5           The result of this process is the information display presenting at least a portion of the received message in accordance with a format determined by the capabilities of the selective call messaging device preferably in conjunction with the formatting information contained in the incoming message.

10           As one of ordinary skill in the art will recognize, the embodiments disclosed herein are general in nature, and may be modified without departing from the spirit and scope of the invention. Modifications contemplated include the extension of the rule set to accommodate rich text formatted messages,  
15           decoding and presentation of proprietary message formats such as associated with commercial computer word processing, presentation, and drawing programs, as well as the rendering of portable document format files or the like. The real power of this invention comes from its ability to present a number  
20           of information content messages on messaging devices with widely varying display capabilities, while substantially maintaining the presentation quality of the message information.

25           What is claimed is:

**CLAIMS**

1. A selective call messaging device, comprising:  
a presentation manager that presents a formatted  
5 message on an information display as determined by intrinsic presentation capabilities of the selective call messaging device independent from any formatting information contained in the formatted message.
- 10 2. The selective call messaging device according to claim 1 wherein the formatted message comprises numeric, alphanumeric, and control characters.
- 15 3. The selective call messaging device according to claim 1 wherein the presentation manager comprises a set of text presentation rules based on the intrinsic presentation capabilities of the selective call messaging device.
- 20 4. The selective call messaging device according to claim 3 wherein a first rule of the set of text presentation rules is to interpret an isolated carriage return character as a carriage return - line feed command pair.
- 25 5. The selective call messaging device according to claim 4 wherein a second rule of the set of text presentation rules is to interpret an isolated line feed character as a carriage return - line feed command pair.
- 30 6. The selective call messaging device according to claim 5 wherein a third rule of the set of text presentation rules is to interpret a horizontal tab character as a command to skip a number of horizontal character cells.
- 35 7. The selective call messaging device according to claim 1 wherein a first intrinsic presentation capability is presenting a message with mono-spaced characters.

8. The selective call messaging device according to claim 7 wherein a second intrinsic presentation capability is presenting a message with proportionally spaced characters.

5           9. The selective call messaging device according to claim 8 wherein a third intrinsic presentation capability is presenting a message with tabular column alignment of characters.

10           10. A selective call messaging device, comprising:  
              a presentation manager that presents a formatted message on an information display as determined by intrinsic presentation capabilities of the selective call messaging device in conjunction with formatting information contained in  
15           the formatted message.

              11. The selective call messaging device according to claim 10 wherein the formatted message comprises numeric, alphanumeric, and control characters.

20           12. The selective call messaging device according to claim 10 wherein the presentation manager comprises a set of text presentation rules based on the intrinsic presentation capabilities of the selective call messaging device.

25           13. The selective call messaging device according to claim 12 wherein a first rule of the set of text presentation rules is to interpret an isolated carriage return character as a carriage return - line feed command pair.

30           14. The selective call messaging device according to claim 13 wherein a second rule of the set of text presentation rules is to interpret an isolated line feed character as a carriage return - line feed command pair.

15. The selective call messaging device according to claim 14 wherein a third rule of the set of text presentation rules is to interpret a horizontal tab character as a command to skip a number of horizontal character cells.

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16. The selective call messaging device according to claim 10 wherein a first intrinsic presentation capability is presenting a message with mono-spaced characters.

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17. The selective call messaging device according to claim 16 wherein a second intrinsic presentation capability is presenting a message with proportionally spaced characters.

15 18. The selective call messaging device according to claim 17 wherein a third intrinsic presentation capability is presenting a message with tabular column alignment of characters.

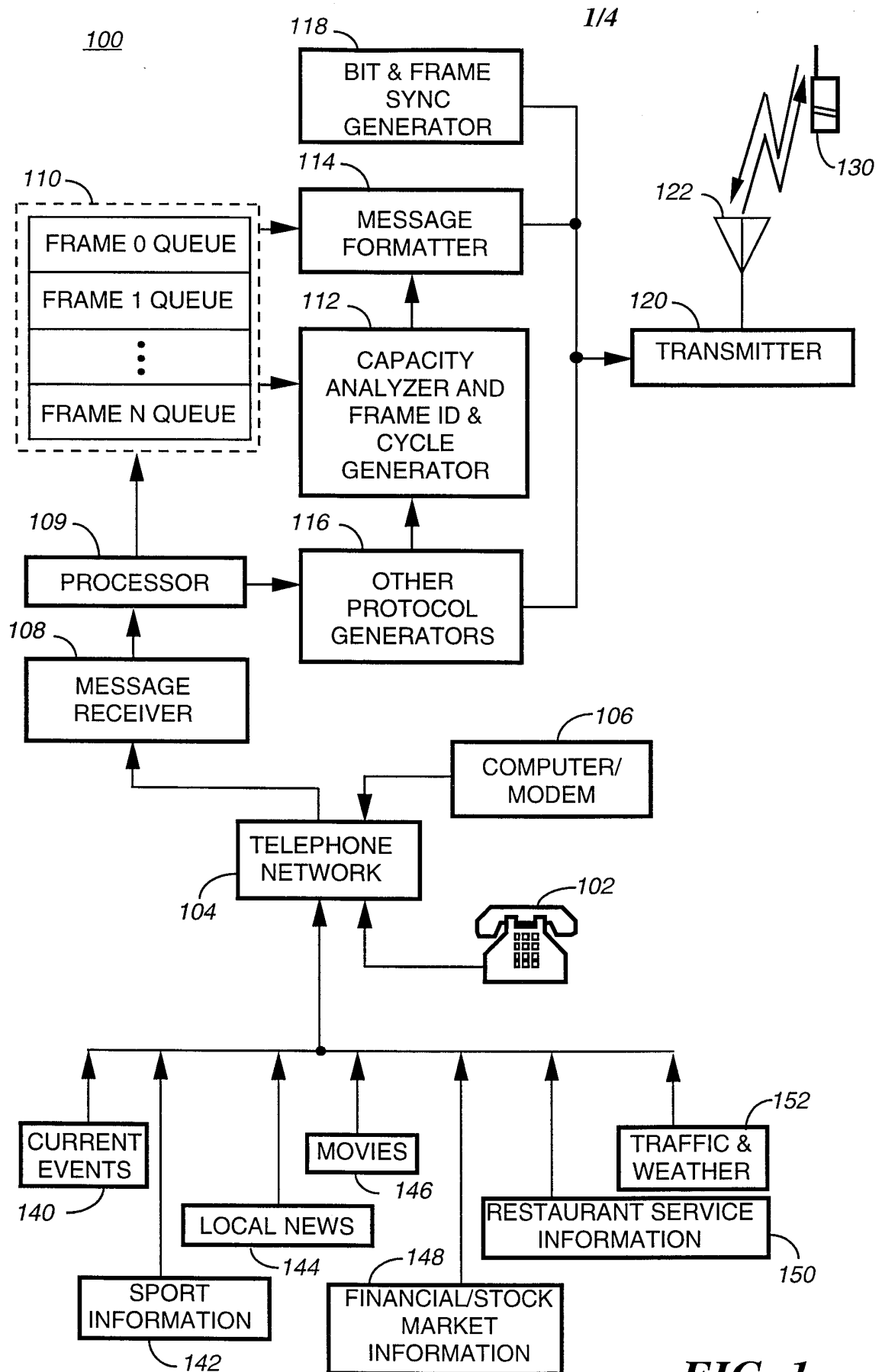
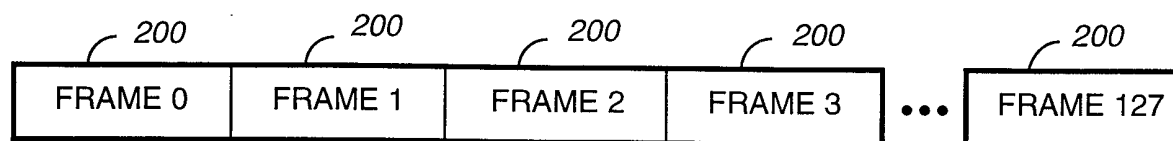
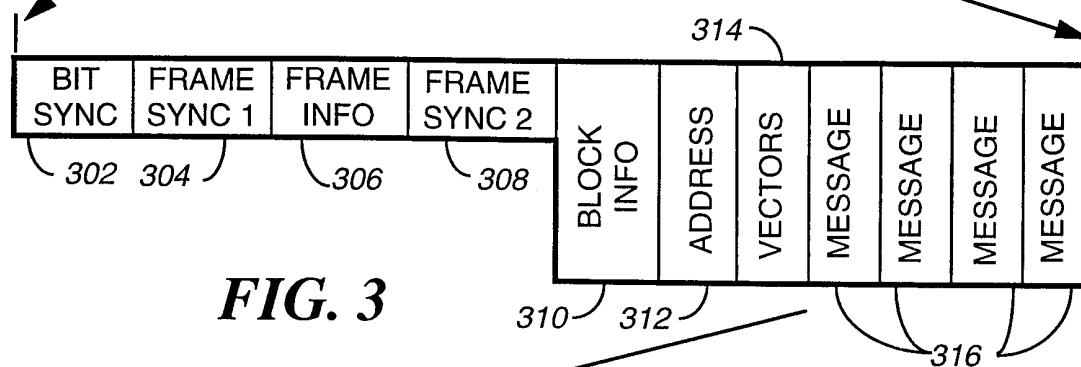
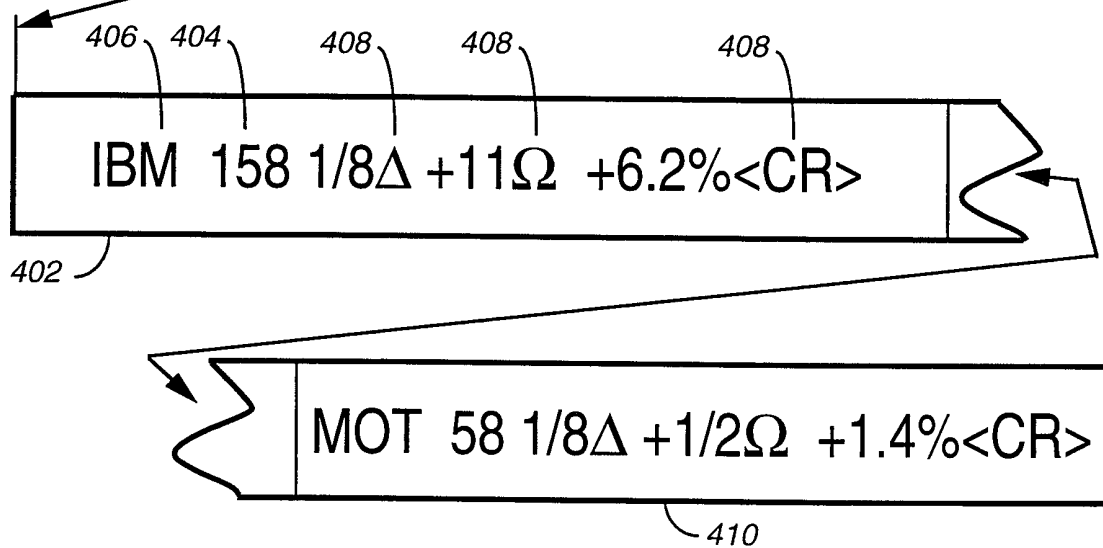
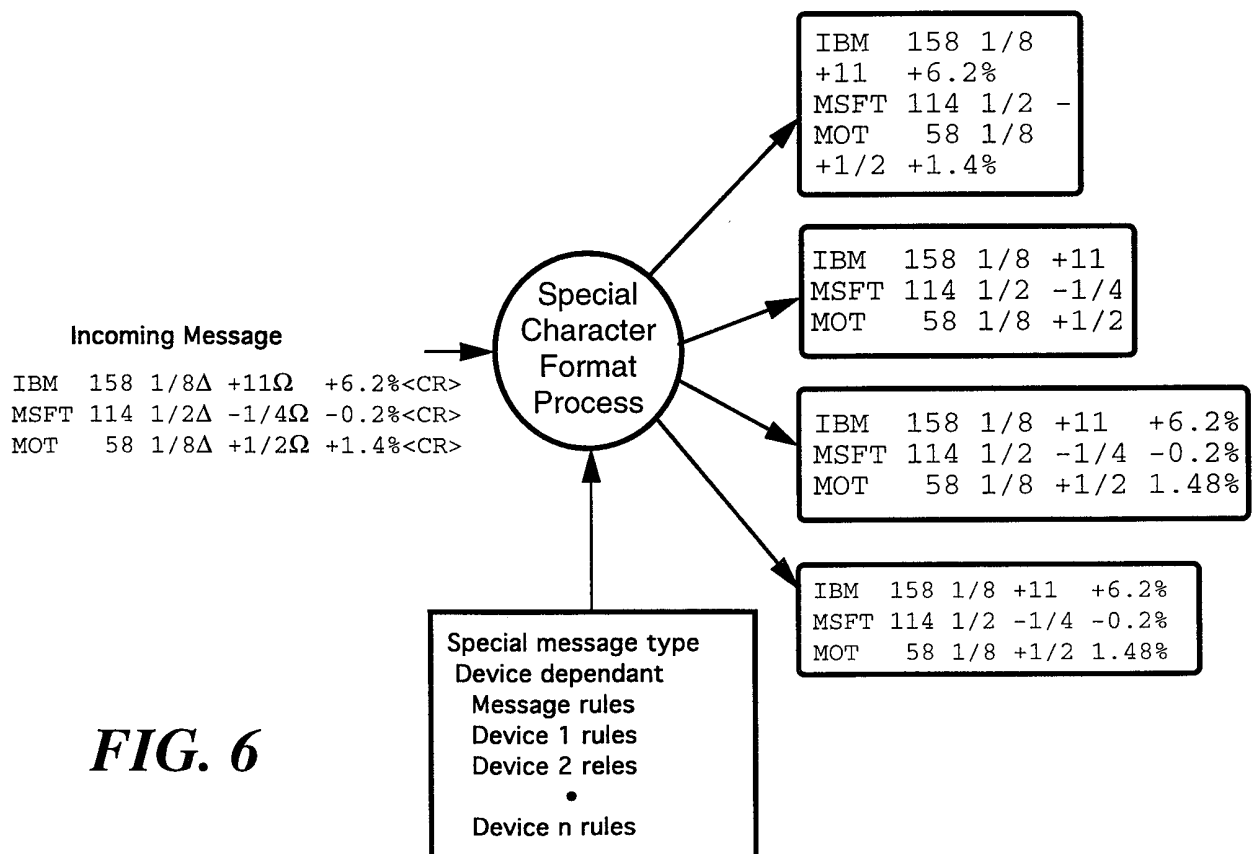
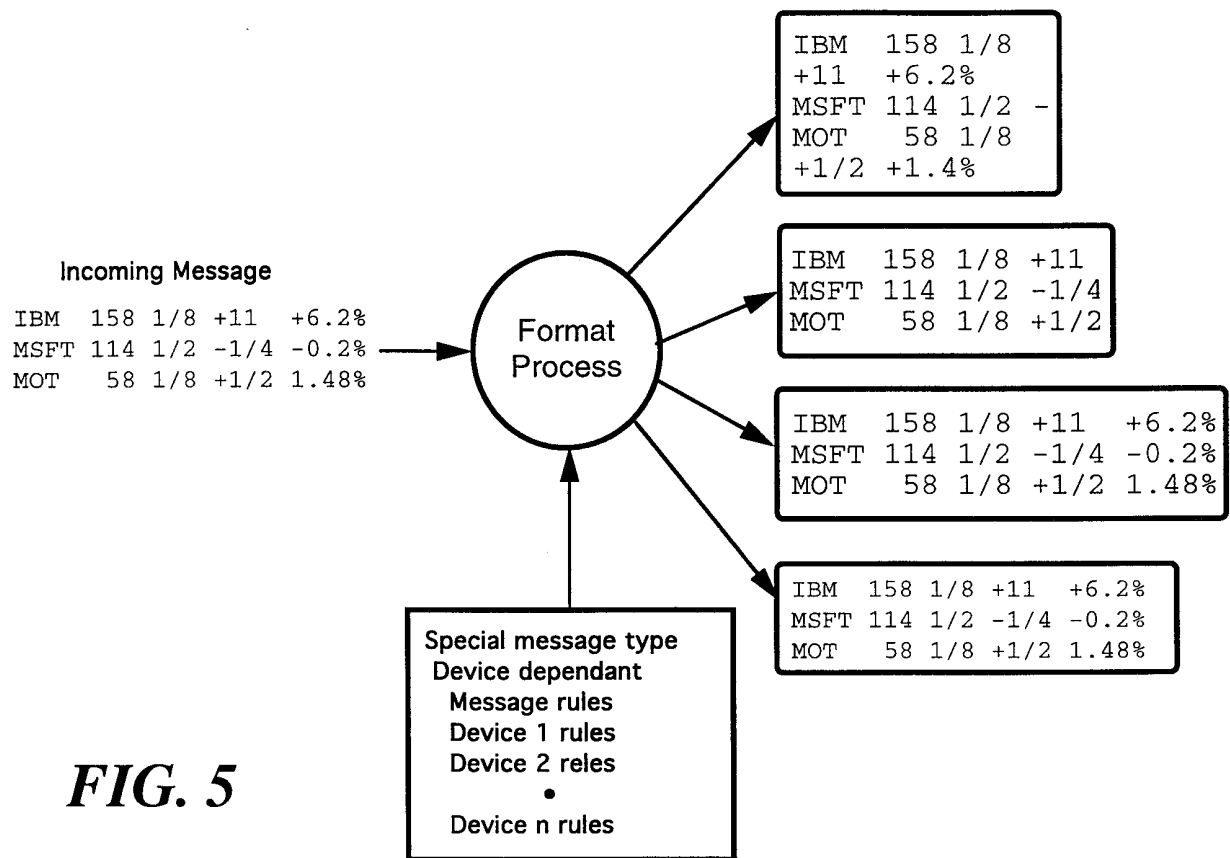


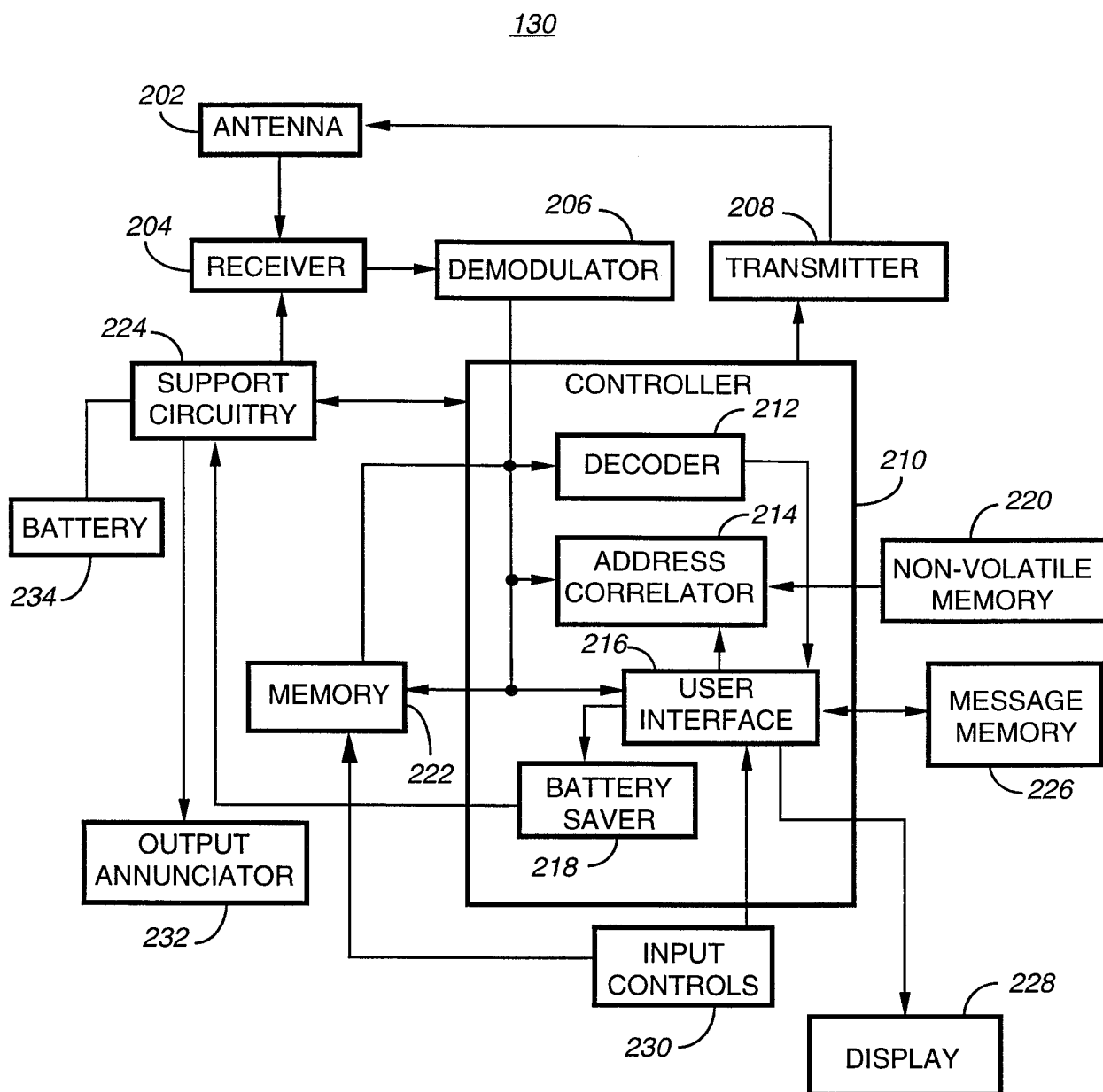
FIG. 1

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**FIG. 2****FIG. 3****FIG. 4**

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**FIG. 7**



## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US98/22892

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : H04Q 1/00, 7/00, 7/06, 7/14; H04B 7/00, 1/38; G06F 15/20

US CL : Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 455/343, 412, 414, 466, 31.2, 38.1, 38.2, 38.3, 38.34.  
340/825.21, 825.44.

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

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

APS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,555,183 A (WILLARD ET AL.) 10 SEPTEMBER 1996, COL. 9, LINE 35 TO COL. 11, LINE 51; COL. 14, LINES 26-67; COL. 16, LINE 45 TO COL. 17, LINE 30.	1-18
Y, P	US 5,694,120 A (INDEKEU ET AL.) 02 DECEMBER 1997, COL. 2, LINE 55 TO COL. 4, LINE 65.	1-18



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	*T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be of particular relevance	*X*	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*E* earlier document published on or after the international filing date	*Y*	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G*	document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means		
*P* document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

28 DECEMBER 1998

Date of mailing of the international search report

18 MAR 1999

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
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INTERNATIONAL SEARCH REPORT

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PCT/US98/22892

A. CLASSIFICATION OF SUBJECT MATTER:  
US CL :

455/343, 412, 414, 466, 31.2, 38.1, 38.2, 38.3, 38.34.  
340/825.21, 825.44.