

Description

Background of the invention

Prior art message systems generally function upon the detection of coded signals which are predestinated to correspond to an address of an individual receiver. Some prior art digital coding systems operate by having a plurality of receivers asynchronously come on a timed basis to look for the presence of a digital word to determine if they should remain on for the detection of a possible message. This constitutes a form of battery saving to the receiver population.

A limitation of such prior art systems is that there is not a convenient method of arranging group calls at the transmitter site or paging terminal so that an arbitrary plurality of pagers may be activated simultaneously. A further limitation with the prior art occurs for tone and voice systems in which the paging receiver provides an alert time after which a voice message may be detected. Each time an individual paging receiver is paged with a voice message the alert time interval during which the pager user is warned so that he may respond to the subsequent audio message is lost to the system since no other information can be transmitted during that interval. If for example, another tone and voice pager were addressed during the alert time for the first addressed tone and voice pager at the conclusion of the second addressed tone and voice pagers alert time its audio channel would be enabled to catch a substantial portion of the voice message for the first addressed tone and voice pager thereby possibly confusing the pager users with respect to the messages they receive.

From US Patent No. 4001772 there is known an encoding device for generating sequential code signals containing information which are to be transmitted to a plural population of receivers, in which a command is transmitted after an address code. However, with such a known encoding device each receiver must be addressed individually and an activation code must be transmitted following each individual addressing of each receiver.

Summary of the invention

It is an object of the present invention to provide an improved method of encoding and encoding device for information signals.

It is a further object of this invention to provide an encoding device which can designate the activation time of addressed receivers.

In accordance with a first aspect of the invention there is provided a method of encoding information signals including a receiver address and an activation code, for transmission of information to a plural population of receivers, characterised by the steps of:

- generating a preamble signal indicative of a single call or a batch call,
- generating a single receiver address after a preamble indicative of a single call and generating a plurality of receiver addresses after a preamble indicative of a batch call, and
- generating an activation code after said single address or plurality of addresses.

In accordance with a second aspect of the invention there is provided an encoding device for generating information signals for transmitting to a plural population of receivers characterized by:

- means for generating a preamble signal for designating a single call or a batch call,
- means for generating a single address signal for a single call and a plurality of address signals for a batch call, the address signals selecting at least one selected receiver of said plural receiver population, and
- means for generating an activation code after generation of the address signals for activating said at least one selected receiver.

One aspect of the present invention includes the positioning of an activation code signal within a broadcast message system such that all receivers which have been correctly addressed remain in a ready state until the detection of an activate code signal which then causes simultaneous activation of the operational routine. Although in a preferred embodiment the present invention is utilised within a digital paging system it is clear to those skilled in the art that it may have many other uses and formats. Moreover the use of such an activation control signal enables the interleaving of messages within a message alert time especially for a tone and voice pager which has been addressed and ensures that the second addressed tone and voice pager will not activate until it receives an activation code signal subsequent to its address. Thus there is no chance that the second address tone and voice pager could come on during the time period in which the first pager was receiving its variable length voice message. Another advantage of such a system is that it further allows interleaving of various types of messages including tone only, data and tone and voice into one signalling system thereby substantially enhancing the flexibility of the transmitted message system.

Brief description of the drawings

One system in accordance with the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

- Figures 1 A—G are timing diagrams for the encoded message system for the preferred embodiment;
- Figure 2 is a functional block diagram of a hardware embodiment of the preferred embodiment;
- Figure 3 is a state diagram representing the functions for the diagram of Figure 2;
- Figure 4 is a functional block diagram of the firmware embodiment of the preferred embodiment;

Figure 5 is an electrical schematic of a portion of Figure 4; and
Figure 6 is a flowchart for the firmware embodiment of the preferred embodiment.

Description of the preferred embodiment

Figure 1A is a timing diagram illustrating the use of the activation code signal in connection with addressing a receiver. Normally receivers detect their address and immediately respond by whatever function corresponds to the predetermined address which has been detected. While this is common in the prior art, it is distinctly advantageous to provide an additional activation code signal which controls the time at which the receiver will respond to the detection of its address. Thus the inclusion of the activation control signal allows the transmitter to determine precisely when any addressed receiver will become active.

As may be more clearly seen by referring to Figure 1B a plurality of receivers may be grouped by including a series of addresses in sequential fashion followed by an activation code signal at the conclusion of whatever arbitrary number of addresses may be chosen to form a batch. The advantage is that upon reception of the activation code all members of the arbitrarily designated batch of receivers will all respond simultaneously. Thus it may be seen that the terminal operator at the transmitter site can create an arbitrary grouping of receivers and cause their subsequent simultaneous activation. This can be a distinct advantage not only in message systems but in simultaneously controlling a plurality of operations at some remote site.

While it is clear that many types and formats of signal coding may be utilized for the present invention the preferred embodiment utilizes a digital signal system designated as the Golay Sequential code. The Golay Sequential Code (GSC) is a selective call paging protocol based largely on the current Golay binary paging format. A full description of the Golay code may be found in a paper entitled "Selective Signalling for Portable Applications" by Leonard E. Nelson, 28th IEEE Vehicular Technology Conference, Denver, Colorado, March 22-24, 1978. The Golay Sequential Code is a NRZ binary signalling format that has been greatly modified from an earlier format to accommodate intermixed tone only, tone and data, as well as tone and voice paging and now improved battery saving.

The GSC is an asynchronous paging format which allows pages to be transmitted individually or in batches. Maximum message throughput for tone only and tone and data pages is achieved in the batch transmission mode; while the individual call mode is useful in tone and voice paging.

The single call address format consists of a preamble, a control word, an address code, and for voice paging, an Activation Code (AC). The preamble serves to divide pagers within the system into groups for improved battery life, as well as to uniquely identify GSC transmissions from other coding schemes to facilitate channel sharing without sacrificing battery life or false call integrity. The control word delimits the end of the preamble and it supplies timing information for the batch mode decoding. The address uniquely identifies each pager and the AC is used to control the pager audio circuits in voice paging. The batch mode of operation allows a string of addresses to be transmitted following the control word.

A data message consists of an address followed by one or more data blocks. Data messages may be transmitted individually in the single call mode or intermixed with address only pages in the batch mode of transmission. Address and data blocks are exactly the same length. The address information is constructed from words selected from the Golay (23, 12) cyclic code while the data information is encoded using the (15, 7) BCH code. Address information is transmitted at 300 bits/second while data information is transmitted at 600 bits/second.

In addition to enabling pagers to operate in a battery saver mode, the polarity of the preamble identifies the transmission mode single call or batch. For instance, when the preamble words are transmitted with one predetermined bit polarity, the single call mode is identified; if the preamble bits are inverted, the batch mode is indicated.

The control word activation code and address code all use a two word format consisting of 28 bits of comma followed by two (23, 12) code words. The comma is a 1, 0 bit reversal pattern transmitted at 600 bits/second. The two Golay code words (Word 1 and Word 2) are separated by a 1/2 bit space. The polarity of the 1/2 bit space shall be opposite the first bit of the second word and the starting comma bit must be of the same polarity as the first bit of the first word. The control word and activation code are predetermined for the preferred system. Word 2 of the control word and activation code are the inverses of the fixed words.

The address format is identical to the control word and activation code formats regarding the number of bits, the rules for comma and the 1/2 bit space. The address Word 2 may be chosen from any word of the (23, 12) code set except the all 0's and all 1's combinations. Thus, there are 4094 potential second words made up of 12 information bits and 11 parity bits. The first words are chosen from a 100 word subset of the Golay code. To generate the binary bit patterns for the (23, 12) Golay code, the decimal representation of the code word is converted to binary. This binary representation is then shifted left.

Tone only pages are those pager addresses which don't involve voice message. Although the single call mode can be used, the batch mode of operation is the preferred method of address transmission for tone only and tone and data pages. The activation code is generally not used in tone only paging, but it may be and an extended batch mode is especially useful in the high traffic periods.

The batch transmission format begins with an inverted preamble followed by the control word and up

to 16 pager addresses or data blocks. The arriving page requests should be grouped as a function of preamble and transmitted on a time or traffic basis at the discretion of the terminal manufacturer and his customer.

It may be desirable to transmit more than 16 addresses within a single preamble batch. The extended batch mode is intended for these situations. The extended batch scheme extends the batch mode in multiples of 16 addresses without requiring the retransmission of the preamble. To accomplish this extension, the terminal need only send the control word. In theory, the batch could be extended indefinitely; however, a very slight degradation in pager sensitivity will occur with each extension.

The GSC format allows data pages to be intermixed with tone only or tone and voice pages. A data page consists of a pager address followed by one or more data blocks. A data block is identical in length to an address block and may be freely substituted for addresses in the batch operating mode. The single call mode can also be used by following the pager address with the data message. Data information is transmitted at 600 BPS to minimize the cross falsing probability between addresses and data.

Figure 1C shows for the preferred embodiment of the present invention the timing diagram the normal message signalling routine for a normal voice page format. Figure 1C shows that a preamble code signal is transmitted followed by a control word and the address of the individual pager. While this is normal for the operation of pagers generally, the address is followed by an activation code and it is preferably upon the reception and detection of the activation code that the individually addressed pager will commence its two second alert mode to warn the pager user of the presence of a subsequent voice message. At the conclusion of the variable length voice message the preferred embodiment shows the inclusion of a deactivation control word which for the preferred embodiment is the second detected occurrence of the activation control word and results in muting the audio channel.

Figure 1D is a signal timing diagram showing some of the advantages which may be achieved by the use of an activation control signal with respect to the terminal control of a batch formatted group call. Figure 1D shows that for the preferred embodiment a preamble inverted signal is broadcast followed by a control word and a series of up to 10 distinct addresses for various pagers. An inverse preamble is used as an indicator in the preferred embodiment of the presence of more than one address and the pager maintains the receive operation so that it will look for more than one address. This function will be described in greater detail in the description of the preferred embodiment in both its hardware and firmware equivalent embodiments.

Although each of the pagers has correctly detected its address none of them has caused any alert mode to initiate since the activation code has not been received. At the conclusion of the tenth address, the activation code signal is sent which causes the simultaneous actuation of all ten addressed pagers. For a voice paging message call in a tone and voice system, all ten pagers simultaneously go into their approximate two second alert times to alert all of the ten various users for the presence of a voice message which is to follow. At the conclusion of the alert time the broadcast voice message is simultaneously received by all ten address pagers. At the conclusion of the variable length voice message the second occurrence of the activation code is interpreted in the preferred embodiment as the deactivation control signal to cause muting of the audio channel for all ten addressed pagers and to enable the system to immediately broadcast additional addresses and other paging information. Thus it may be seen that the use of an activation control signal allows the terminal control of an arbitrary batch of pagers to achieve a simultaneous function. Moreover a message can be sent to a plurality of pagers arbitrarily selected at the terminal site into a batch simultaneously.

Figure 1E is a message timing diagram showing the advantages of the use of an activation code to utilize normal unusable alert time for an individually addressed and activated pager to increase the information throughput for the message system by additionally addressing without activation an additional pager. Figure 1E in sequence shows that a preamble signal is followed by the customary control word, address 1 and an activation code for a first pager. Upon receipt of the activation code the address 1 pager goes into an approximate two second alert time to warn the pager user that a voice message is to follow. Normally for such tone and voice systems or other similar systems, no utilization can be made of the alert time delay. Thus there is a two second loss of otherwise valuable broadcast time during which additional information could be transmitted. As may be seen in Figure 1E during the two second alert time the preamble control word and second address for a second pager can be transmitted without affecting either the operation of the first pager or the operation of the second pager. At the conclusion of the second address the transmitter then provides the variable length voice message for the first pager which is received by only the addressed and activated pager number 1.

At the conclusion of the variable length voice message for pager number 1 the activation code second detection operates as a deactivation code for the addressed and actuated pager 1. This also corresponds to the activation code for the second addressed but as yet not activated pager, thus the second transmission of the activation code positively terminates the operation of the first addressed and activated pager and establishes the normal sequence for operation for the second addressed and now actuated pager.

In normal operation there is a two second address two page alert time during which time a third preamble control word and third address may be transmitted to correctly address but not activate a third pager. As before at the conclusion of the third address the voice message for the second address pager commences and in a manner similar to the voice message for the first pager it will be concluded by the

second occurrence of the activation code which for the address and activated pager 2 will be interpreted as a deactivation control word while simultaneously being interpreted by the addressed but as yet unactivated pager 3 as the correct activation code for it to start its alert sequence. Thus it may be seen from Figure 1E that the overall message information system can be tightly packed with complete utilization of the normal two second alert time which ordinarily would be lost to a transmitter system operator and thus materially enhance the information throughput for the system.

Figure 1F shows the message timing diagram for an additional variant form of the use of the activation code for what may be referred to as a formatted terminal group call. While Figure 1D shows the operation of addressing a string of ten or more pagers, because of the construction of the code signal population for the preferred embodiment it was necessary to use the preamble bar designation to cause this system to go into a mode in which more than one address could be decoded. Of necessity this indicates that those addressed pagers must all be in the same proportion of the population so that they can respond to the same preamble. To demonstrate the greatly increased flexibility of an information system employing an activation control word, Figure 1F shows that the individual pagers which may be grouped do not have to be related by having a common preamble.

Figure 1F shows that the transmitter can provide preamble 1 followed by control word and address one which are followed by preamble two, a control word and address two, which is followed by preamble three, control word and a third address. The sequence is purely arbitrary and the length depends on how long the time period has been designated for the system to stay up and look for an activation code. The transmitter then provides an activation code signal which causes the simultaneous activation of all three addressed but not activated pagers from three completely arbitrary groupings of the possible receiver population. At the conclusion of the transmission of the activation code all three address paging receivers simultaneously go into the alert mode and at the conclusion of the alert mode all three pagers simultaneously respond to the then transmitted voice message which is terminated with the second occurrence of the activation code which for the three addressed and actuated pagers constitutes a deactivation control signal.

There are many other variant forms for combinations of the use of an activation control signal and such a message information system. Figure 1G shows a message timing diagram for a substantially mixed system operation in which a preamble bar signal followed by a control word, three normal addresses, a data address, data information, a voice address for a fifth receiver, all cause three tone only pagers, one data pager and one voice pager to be correctly addressed but not activated. Normally for the preferred embodiment, the activation code is utilized for tone only operation but may be easily modified. The voice address for the fifth pager is then followed by the activation code which causes the voice pager to go into its alert mode so that the pager user can be prepared to receive the voice message. Upon the reception of the activation code it will be appreciated that the first three tone only page carriers have received the signal that a page has been received and that the data page information and subsequent data information which can also be encoded in such systems are already received.

During the alert time for the voice addressed pager nine additional tone only addresses can be broadcast followed by a short time gap for the system of the preferred embodiment which is less than one equivalent word length. This is then followed by the variable length voice message. The variable length voice message is then supplied only to the fifth addressed voice pager which has been activated by the first reception of the activation code. At the conclusion of the variable length voice message the second activation code terminates the operation of the voice channel for the fifth activated voice pager and also causes activation of the nine additional address tone only pagers so that no time is lost in the system.

It will be appreciated by those familiar with such data information systems that normally tone only operation causes an alert signal to be provided to the pager user for a fixed timeout period thus it is not necessary in the case of tone only pages to send a deactivation code to terminate the message since the receiver itself provides an alert for a short fixed length of time. Moreover it may be seen that addressing a data pager and following it subsequently with the data information and then in sequence an activation code will cause first the addressing and detection of the data message and subsequently the activation of the pager to announce the detected message. Those skilled in the art will appreciate that there are many other variant forms of the use of an activation code to material enhance the throughput of information in such information transmission systems, especially for the interleaving of messages of mixed type and for the simultaneous activation of previously addressed receiver units. This simultaneous activation can cause functions to occur simultaneously at various remote locations as in combination with the activation code used for selectively and sequentially addressed pagers can cause time sequenced operations to occur at remote locations.

Figure 2 shows the encoder for transmission of the activation code in accordance with the invention. Control logic 101 comprises a PLA (programmable logic array) that is the sequential logic control for the encoder. The timing for the PLA is provided by timer 103. A word file which stores the digital address of a particular pager and also the digital word for the activation code is provided by a word file 105. A key pad 107 may be used by the operator to indicate to the encoder circuitry which pager the operator wishes to address. A keyboard decoder 109 decodes the keyboard number entered by the operator and outputs an address signal to the word file 105. Simultaneously the key board decoder 109 also notifies the control logic 101 that a keyboard number has been entered. Binary addresses from the word file 105 are loaded into a

shift register 111 thru a parallel data input. Shift register 111 serially clocks out the data entered from the word file 105. The serially outputted data is sent to a transmitter 113 thru a selector circuit 115.

A voice storage unit 117 records a spoken voice thru microphone 119 and amplifier 121 for playback thru the selector circuit 115 to transmitter 113 at an appropriate time. The appropriate time is determined by the sequential logic control circuit 101 as will be more fully explained in connection with Figure 3. A talk light 123 indicates to the speaker when the voice record unit 117 is in the record mode. An exclusive-OR gate 125 inverts the outputted data from shift register 111 when the sequential control logic 101 provides the exclusive-OR gate 125 with an appropriate input. A page button 127 signals the sequential logic control circuit 101 that the user is ready to send the address of the particular key on keyboard 107. A programmable timer 129 is loaded with appropriate time durations which serve to provide the maximum time durations for certain sequential operations to be described in connection with Figure 3.

The encoder shown in Figure 2 is used to transmit data which is intended for a pager utilizing a battery saver mode of operation. The battery saver mode of operation for a pager is a well known method of extending battery life. In a battery saver mode of operation, the total number of pagers in a system are divided into subgroups. Each subgroup has its own particular address usually referred to as a preamble.

The keyboard 107 shown in Figure 2 has for illustration purposes four pagers divided into two battery saver subgroups. The number of total pagers and subgroups can be much greater and still operate in the same manner. Pagers 1 and 2 belong to a first subgroup and are addressable as a group thru preamble 1 and pagers 3 and 4 belong to a second battery saver subgroup and are addressable thru preamble 2.

Figure 3 shows the state diagram for the encoder circuitry of Figure 2. Each state is identified by a rectangle containing a short descriptive phrase. Each state is numbered chronologically from 0 to 25. As is immediately apparent from an inspection of Figure 2, the operation of the encoder is best described in a time sequential manner from the perspective of the control logic 101.

The state diagram in Figure 3 is broken into three operational branches. The first is a group call operation. If the operator at the transmitter site wishes to simultaneously send a single voice message to a group of pagers, a plurality of key pads on keyboard 107 corresponding to the pager addresses are pressed before pressing the page key 127 to cause transmission of the information. The second operational branch is the single voice page operation. This is the simplest operation for the encoder as it involves only a single key pad depression corresponding to a pager address followed by a single page key depression. The third operational branch, labeled interleaving operation, utilizes the transmission time in a single voice page transmission that is usually "dead time" or alert time in which the particular pager being addressed cannot further operate on any transmitted signals. For this particular system, this "dead time" is during the period in which the pager sounds an audible alerting tone to its user after the pager has received its transmitted address from the encoder. The alert tone warns the user that a voice message is about to follow. Usually the alert lasts approximately two seconds. Correspondingly, after an encoder has transmitted the address of the pager there is a two second period during which the encoder must wait before it transmits the voice message. In one aspect of the present invention during this two second period, the encoder can utilize the "dead time" to transmit a preamble, control word and address to a second pager whose key pad and page key have been pressed.

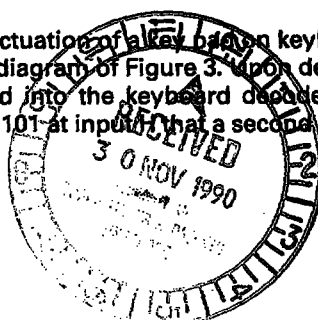
The state diagram in Figure 3 should be interpreted in conjunction with the circuit diagram of the encoder in Figure 2 and serves as the basis for the operation description of the encoder. State 0 is entered by turning on the encoder and the encoder is ready to receive the signal of a first key depression. The control logic 101 is responsive at input B for a signal from the keyboard decoder 109 indicating that a key on keyboard 107 has been depressed. The voice storage unit 117 is neither recording nor playing. The talk light 123 is off. The selector 115 is in an arbitrary state since the transmitter 113 is turned off. The inverter signal I from control logic 101 is also in an arbitrary state since the transmitter 113 is turned off.

In the preferred embodiment the clock CLC from timer 103 for controlling the internal timing of the control logic 101 is a 4.35 hertz clock and is continuously inputted to the load input of shift register 111 by way of the control logic 101. The address input of word file 105 is arbitrary in state 0. The page key 127 is also in an arbitrary state since the control logic 101 is inhibiting its B input. The shift register clock CK from timer 103 is set at 600 Hertz. When an individual page key of keyboard 107 is pressed, the keyboard decoder 109 latches the key number and sends a signal to the control logic 101 that a key has been depressed. The control logic 101 moves to a second state shown in Figure 3 as state number 1 (or the hit second key stage).

In state 1 the control logic 101 is responsive to a second key to be depressed. That key could either be a single key from the keyboard 107 or it could be the page key 127. The state of the control logic 101 and of the remainder of the encoder is the same as it was in state 0 except that now the control logic 101, in addition to keyboard 107, is responsive to a detection of the page key 127 at the B input of the control logic 101. The two events that may move the encoder out of state 1 have been mentioned before. They are either a page key depression or a second depression of a key pad on keyboard 107.

Group call

The event that will be discussed first is the second actuation of a key pad on keyboard 107. This event will cause a transition from state one to state two in the diagram of Figure 3. Upon depression of a second key pad, the key number from keyboard 107 is latched into the keyboard decoder 109. The keyboard decoder 109 again sends out a signal to the control logic 101 at input B that a second key number has been



pressed. The occurrence of the second depression of the key pad on keyboard 107 causes the keyboard decoder 109 to toggle and to establish an output of the first key pad output code on the address lines of word file 105. This concludes the transition and the encoder is in state 2 as shown in Figure 3.

The state of the circuitry of the encoder in State 2 is unchanged except the control logic is only looking for a page signal from page key 1. The encoder will move from State 2 to State 3 when it receives a signal from this page key. Immediately following depression of the page key, the control logic 101 will load a voice duration time into the programmable timer 129.

In State 3, the control logic 101 and the remainder of the encoder circuitry continues in the same state as it was in previously. Except now the T output of the control logic 101 actuates the talk light 123 and the record input (REC) on the voice storage unit 117. The operator, noticing that the talk light 123 is on, can now speak into microphone 119 and his voice will be recorded in voice storage unit 117 by way of amplifier 121. After the operator has completed his message the programmable counter 129 will time out the voice duration time and cause the encoder to change to State 4.

As the encoder enters State 4 the programmable counter 129 is again loaded but this time with the time duration corresponding to the preamble transmission. Simultaneously with the loading of the programmable timer 129, the control logic circuit sets both A0 and A1 output, which addresses word file 105, to 0 in anticipation of sending the preamble address. The preamble binary code is now present on the output of the word file 105. In State 4, the control logic 101 turns off the talk light 123 and turns off the record input to the voice storage unit 117. The control logic 101 enables the B input of selector 115. The inverting data output I of the control logic 101 activates the exclusive-OR circuit 125. Transmission of the preamble in an inverted format tells the group of pagers recognizing the preamble that a group call made transmission is to follow.

The load input-clock operation loads the binary word for the preamble into the shift register 111. The control logic 101 in State 4 inhibits reception of inputs from both the keyboard decoder 109 and from the page key 127. In State 4 the control logic 101 is unaffected by a pressing of the key pads of keyboard 107. Also in state 4, the control logic turns on the transmitter 113. The shift register 111, shifts out the binary code in a serial manner thru exclusive-OR gate 125. The data is shifted out at a 600 Hz rate as determined by the 600 Hertz clock inputted to the shift register 111 from timer 103.

As the data passes thru exclusive-OR circuit 125 it is inverted and then supplied to the B input of selector 115. The control logic 101 has told the selector to select the B input to be passed to the output of the selector 115. Since the transmitter 113 is on, the preamble binary code will be modulated and transmitted. After the programmable counter 129 has timed out the shift register 111 will have completed its serially output of preamble code. When the time out occurs the control logic 101 and the remainder of the encoder transfers from State 4 to State 5 as shown in the diagram in Figure 3.

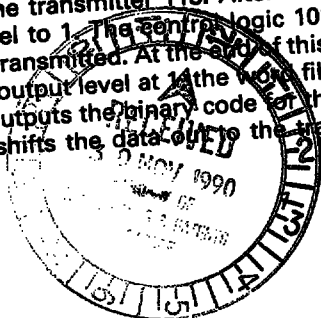
As the encoder enters State 5, the A0 and A1 outputs of the control logic 101 are both set to a 1 level. In State 5 the encoder sends the control word which serves to alert the group of pagers under the previously sent preamble that a message is about to follow. In state 5, the inverting output of control logic 101 which inputs to exclusive-OR gate 125 is deactivated. The binary code for the control word is outputted by word file 105. It is loaded into the shift register 111 by a load signal from the control logic 101 and serially clocked out of the shift register 111 and into the transmitter 113 by way of selector 115. In State 5 as in State 4 the control logic 101 is still actuating the B input of selector 115. Also the control logic 101 still has the transmitter 113 turned on. As in State 4, the control logic 101 in State 5 has deactivated inputs from the keyboard decoder 109 and its inputs from the pager key 127. The control logic 101 internally times the sending of the control word and moves to state 6 after the time period has timed out. In the transition to State 6, the A0A1 outputs of logic control circuit 101 changes to 0 for A1 and 1 for A0.

In state 6 as shown in Figure 3, the first pager address is transmitted. The pager address identifies a particular pager within the selected preamble group. In response to its input address the word file 105 supplies a binary code to the shift register 111. As before the shift register 111 loads the binary code and clocks it out thru the exclusive-OR circuit 125, the B input of selector 115 and finally out to the transmitter 113.

After the shift register 111 is loaded with the binary code for the first address and begins to serially output the data, the control logic 101 must toggle the latch toggle line, LA, to keyboard decoder 109. This causes the keyboard decoder 109 to present at its output the second pressed key pad number code. The encoder transfers from State 6 to State 7 in accordance with the internal timing scheme of control logic 101 when the internal control logic of control circuit 101 determines that the first address has been sent.

In the beginning of this state 7 the keyboard decoder 109 is providing the address corresponding to the second key pad depressed. The output of word file 105 is the binary code for the pager address identified with that particular key pad. The shift register 111 is loaded again, as before, but this time the data loaded is the binary code of the pager address of the second key pad pressed. Again the data is serially shifted out thru selector 115 and to the transmitter 113. After the shift register 111 is loaded, the control logic 101 changes the A0 output level to 1. The control logic 101 determines by internal timing when the second address has been serially transmitted. At the end of this time the encoder transfers from state 7 to state 8.

In State 8 with the A0 output level at 1 the word file 105 outputs the binary code for the control word again. The word file 105 outputs the binary code for the control word and the shift register 111 loads the binary code and serially shifts the data out to the transmitter 113. The programmable timer 129 is set



internally to time the tone alert or beep time duration which will occur at the pager when it receives the control word.

The timing of the beep duration is done in state 9 after the control word in state 8 has been sent, the encoder moves to state 9 where the internal counter 129 times out the beep duration. The alert time duration represents the time period of which the pager unit sounds a tone to alert the user that a voice message will immediately follow.

In order to avoid transmitting during the time that the pager is beeping, the programmable timer 129 counts that beeping period as measured from the time of transmission of the second control word and ensures that no transmissions occur during that time (usually around 2 seconds). At the end of the beep duration, the timer 129 times out and the encoder moves to state 10 as shown in Figure 3.

As the encoder moves to state 10 the control logic 101 loads the programmable timer 129 again. This time with a binary code for the duration of the voice to be transmitted. This time duration is preferably constant, thereby allowing for a maximum stored message length. The time duration is determined by the running time of one complete loop of the voice storage unit 117.

In State 10, the control logic 101 activates the play input operation of the voice storage unit 117 and actuation of the A input of selector 115. The transmitter 113 is turned on. The recorded voice is transmitted over transmitter 113 and the encoder waits for the timing out of the voice duration time in programmable timer 129. At the end of the time out the encoder returns to state 0 as is shown in Figure 3.

20 Single page

Referring back to the second state transition option in State 1, a page key can be depressed in state 1 instead of a second address key. Depressing the page key transfers the encoder from state 1 to state 11. In the transition from state 1 to state 11 the programmable timer 129 is loaded with a voice duration time period. In state 11 everything in the encoder is as it was initialized in state 1. The talk light is turned on and the record input to the voice storage unit 117 is also turned on and begins to record. If while in State 11 a key pad on keyboard 107 is again depressed, its address will be latched into the keyboard decoder 109. By analogy State 11 is identical to state 3 discussed previously except that in state 11 the encoder is looking for a time out message from programmable timer 129 and a page key detection at input B of control logic 101.

Two possible transitions exist from state 11, the encoder can move to state 12 or to state 16. The transition from 11 to 16 will be described later in the discussion of interleaving. If no additional key address is pressed, then the encoder will move to state 12 when the programmable timer 129 times out. During the transition the programmable timer 129 is loaded with the time period required for the transmission of the preamble.

In State 12 the encoder outputs are in the same condition as they were in state 4 except the inverting output, I, of the control logic 101 is not activated. Also the control logic is now sensitive to a page signal at its B input as it was in State 11. The transition from state 12 can be to two different states. State 18 or from state 12 to state 13. If a new key address is pressed at the keyboard 107, the transition will be from state 12 to state 18. This transition will be described later. The transition from state 12 to state 13 is identical to the transition from state 4 to state 5.

State 13 is substantially the same as state 5 except the control logic 101 is looking for an input from the page key as it was in States 11 and 12. From state 13 if a page key is detected the transition is to state 19. This transition will be described later in connection with interleaving. Without a page key detection at the B input of control logic 101 the transition from State 13 is to State 14. This transition is identical to the transition from State 5 to State 6.

State 14 is substantially identical to state 7 except that the control logic 101 is still looking for a page key signal as it was in states 11, 12 and 13. If the control logic 101 receives a page key signal at its B input the encoder will experience a transition from stage 14 to 21. This transition will also be described later. Without a page key signal detection, the encoder will transfer state 14 to state 15. This transition is identical to the transition from state 7 to state 8.

State 15 is substantially identical to state 8 except that the control logic 101 is still responsive to a page key signal at its B inputs as it was in states 11—14. If the page key signal is detected by the control logic 101, the transition for the encoder is from state 15 to state 21 which will be described later in connection with interleaving. Without a page key detection the encoder transfers from state 15 to state 9 as shown in Figure 3. This transition is the same as the transition from state 8 to state 9.

55 Interleaving

The state transitions whose discussions have been deferred will be covered in the description of the interleaving operation. Returning back to state 11, if a page key is pressed while the encoder is in this state, the transition will be from state 11 to state 16. In this transition the programmable timer 129 continues counting from state 11 into state 16. State 16 is substantially similar to state 3 with the transition being caused by the timing out of the programmable timer 129. From state 16 the transition is to state 17. This transition is the same as the transition from state 3 to state 4 except that the inverting signal, I from the control logic 101 into exclusive-OR 125 is not activated.

State 17 is substantially similar to state 4. The transition from state 17 to State 18 is identical to the transition from state 4 to state 5. State 18 is substantially similar to state 5. The transition from state 18 to

state 19 is identical to the transition from state 5 to state 6. State 19 is substantially similar to state 7. The transition from state 19 to state 20 is identical to the transition from state 7 to state 8.

State 20 is similar to state 8, except that the control logic 101 toggles, through its LA output, the keyboard decoder 109 to cause the key decoder to output on lines A_2 and A_3 the most recently pressed key pad on keyboard 107. The control logic 101 sets both A_0 and A_1 to 0. The programmable timer 129 is loaded with a time duration sufficient for the transmission of the preamble in state 21. The transition from state 20 to state 21 is automatically timed in control logic 101.

In state 21 the encoder is in a state identical to state 4. The transition from state 21 to state 22 is identical the transition from state 4 to state 5. State 22 is identical to state 5. The transition from state 22 to state 23 is identical to the transition from state 5 to state 6. State 23 is substantially similar to state 7. The transition from state 23 to state 24 is identical to the transition from state 9 to state 10.

In state 24 the encoder is in a state substantially similar to state 10 except the control logic 101 is sensitive to a page key depression and the talk light 123 and voice storage unit 117 are turned on. The operator's message directed to the second keyed pager is now recorded into the voice storage unit 117. The second voice message is associated with the key pad and page key pressed and sensed in state 11. The transition from state 24 to state 15 is caused by the timing out of the control timer 129 without a page key being pressed.

From state 15 the sequence repeats its normal pattern to either state 9 or state 21. If a page key depression is sensed in state 24 the encoder will transfer from state 24 to state 25. This transition is identical to that from state 11 to state 16. State 25 is substantially similar to state 10 except that the control logic 101 holds the talk light 123 on and also continues to record the next voice message. After the completion of the second voice message, the encoder transfers from state 25 to state 21. From state 21, the encoder repeats the steps from state 21 thru state 24. At state 24 the encoder again looks for a page key depression. A detection of the page key hit determines whether the next state of the pager is state 15 or state 25 as was described earlier.

State transitions from single page operation into interleaving operation are caused by the encoder detecting a page key depression while in states 12, 13, 14 or 15. A page key depression detected in these states will result in the encoder transferring to an interleaving state. States 12, 13, 14 and 15 will transfer to states 18, 19, 20 and 21 respectively. If the encoder enters interleaving at state 21, the encoder must toggle the LA input to keyboard decoder 109 in addition to its normal operations in state 21.

It should be noted that if a squelch mechanism is used to terminate voice transmission, there would be a need for two voice storage units. The need arises since with a squelch mechanism the two voices stored in the voice storage units are no longer necessarily the same time length.

It should also be noted that the encoder of the invention can be incorporated into a telephone exchange system in a well known manner.

Table 1 on the following page is a time sequential logic table of the PLA comprising control logic 107 in accordance with the invention.

TABLE 1 LOGIC TABLE for PLA

Inputs		Present State					Outputs					Programmable Timer Count				
(O)	II B	Q ₄	Q ₃	Q ₂	Q ₁	Q ₀	D ₄	D ₃	D ₂	D ₁	D ₀	T, P, S, K, I, LA	A ₀	A ₁		
X	0	X	0	0	0	0	0	0	0	0	0	0	X	0	X	Voice Duration = 8 Sec.
X	1	X	0	0	0	0	0	0	0	1	0	0	X	0	X	
X	1	0	0	0	0	1	0	0	0	1	0	0	X	0	X	
X	0	0	0	0	0	1	0	0	0	1	0	0	X	0	X	
X	X	0	0	0	1	0	0	0	0	1	0	0	X	0	X	Voice Duration = 8 Sec.
X	X	1	0	0	1	0	0	0	1	1	0	0	X	0	X	
0	X	X	0	0	1	1	0	0	0	1	1	0	X	0	X	
1	X	X	0	0	1	1	0	0	1	0	0	1	0	0	X	
0	X	X	0	0	1	0	0	0	1	0	0	0	1	1	0	Preamble Duration = 1.68 Sec.
1	X	X	0	0	1	0	0	1	0	1	0	0	1	1	0	
X	X	X	0	0	1	0	1	0	1	1	0	0	1	0	1	
X	X	X	0	0	1	1	0	1	1	1	0	0	1	0	1	
X	X	X	0	1	0	0	0	1	0	0	1	0	0	1	0	Beep Time = 2 Sec.
0	X	X	0	1	0	0	1	0	0	1	0	0	1	0	1	
1	X	X	0	1	0	1	0	1	0	0	1	0	0	X	X	
0	X	X	0	1	0	1	0	1	0	0	0	0	0	X	X	
0	X	X	0	1	0	1	0	1	0	1	0	1	1	X	0	Voice Duration = 8 Sec.
1	X	X	0	1	0	1	0	0	0	0	0	1	1	X	0	
X	0	1	0	0	0	1	0	1	0	1	1	0	X	0	X	
0	X	0	0	1	0	1	0	1	1	1	1	0	X	0	X	
1	X	0	0	1	0	1	0	1	1	0	0	1	0	X	0	Preamble Duration
0	X	0	0	1	0	0	0	1	1	0	0	0	0	0	0	
1	X	0	0	1	1	0	0	1	1	0	1	0	0	0	0	
0	X	0	0	1	1	0	0	1	1	0	0	0	1	0	0	
1	X	0	0	1	1	0	0	1	1	1	0	0	1	0	1	Beep Time = 2 Sec.
X	X	0	0	1	1	1	0	1	0	0	1	0	0	1	X	
X	X	0	0	1	1	1	0	1	0	0	0	0	0	1	X	
0	X	1	0	1	0	1	1	0	0	0	1	0	0	X	X	

TABLE 1 (cont'd...)

-2-

(O) H B	Q ₄	Q ₃	Q ₂	Q ₁	Q ₀	D ₄	D ₃	D ₂	D ₁	D ₀	T, P, S, K, I, LA	A ₀	A ₁	Programmable Timer Count	Preamble Duration
0	X	X	1	0	0	0	1	0	0	0	0	0	X	X	
1	X	X	1	0	0	0	1	0	0	1	0	X	0	X	X
0	X	X	1	0	0	0	1	0	0	0	1	0	0	0	0
1	X	X	1	0	0	0	1	0	0	1	0	0	0	0	0
X	X	X	1	0	0	1	0	0	1	1	0	0	1	X	
X	X	X	1	0	0	1	1	0	1	0	0	1	0	0	1

Figure 4 shows the functional block diagram of the encoder for the preferred embodiment of the invention in which a microphone 200 is coupled through an audio amplifier 202 to a preemphasis circuit 204 which finally produces an audio signal. This audio signal is supplied to a pair of transmission gates 206 which, as will be described in detail later, allow for the selection of either audio or data information to be transferred to the modulating input of a transmitter 208. An antenna 209 is coupled to transmitter 208. The transmission gates 206 are preferably of the type manufactured by Motorola and designated MC14551. A keyboard 210 is coupled to a CRT 212. This combination is preferably a Lear Siegler Model ADM-3A. The RS232 output of the CRT is coupled to a 6800 base computer 214 which further includes the several additional modules which are: a MEX 6820 I/O module, a 68MM19 6809 monoboard, microcomputer, a MEX6812—1 2K static RAM, and a M68MMCC05 Card Cage for a micro module.

A PBO output of computer 214 is coupled to the data input of transmission gate 206, the input of an audio data select circuit 216 and the input of an audio/data detect circuit 218. The output of the audio/data select circuit 218 is coupled to the selection input of the transmission gate 206. A zero logic level at this selection input terminal indicates that the data transmission gate is activated and a 1 level indicates that the audio information gate is activated to supply the corresponding information to the modulating input of transmitter 208.

The output of audio data detect circuit 218 keys to transmitter so that the operation of audio data detect circuit 218 is similar to an OR function in that if either signal is detected as being present at its input the transmitter is keyed so that input may be modulated by the RF carrier. The combined signal is supplied to antenna 209 for broadcast.

Figure 5 shows the detailed circuitry for audio/data detect circuit 218 and audio data select circuit 216. The PBO output of computer 214 is coupled to the input terminal of audio data detector 218 which comprises a retriggerable monostable. The circuit operates to maintain a constant signal output so long as a signal edge is detected within a predetermined time period of every 100 milliseconds. The absence of a detected signal edge during that time period would indicate that neither data nor audio signals were present.

In the operation of the audio/data detector circuit 218, the PBO output terminal of computer 214 is coupled directly to a first input of an OR gate 230 and through an inverter 230 to the second input. The output of OR gate 230 is coupled to the trigger input of a monostable 234 which may be implemented using one-half of an IC designated MC14538. A timing network is provided for the monostable and VDD, the source of voltage, is applied to the clear input terminal of monostable 234. The VDD is also applied through a resistor 236 to a timing input of the monostable and through a capacitor 238 connected to ground. The combination of the resistor 236 and capacitor 238 provide a timing circuit for monostable device 234. The Q1 output of monostable 234 is coupled directly to transmitter 208 as shown in Figure 4 to provide the transmitter keying control signal.

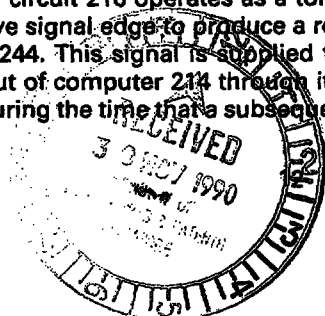
The function of the audio data detector 218 is to receive within every 100 millisecond interval an edge indicating that either a data or an audio signal is present on the line. As each edge is detected in the OR gate 230, it retriggers monostable 234 for its predetermined time. As long as pulses are received at an interval that is less than the normal time out for the monostable, a Q1 output of monostable 234 in audio data detector 218 will remain at a logic level thereby keying the transmitter.

The PBO output of computer 214 is also connected directly to the first input of an OR gate 240 and through an inverter 242 to the second input of OR gate 240. The first input of OR gate 240 is coupled to ground. The output of OR gate 240 is coupled to the trigger input of a second retriggerable monostable 244. Monostable 244 is preferably half of the same IC package which was utilized to implement audio/data detector circuit 218. For monostable 244, VDD is applied in the same manner to produce a somewhat different timing characteristic for its operation. This new time is chosen by the value of a resistor 246 and capacitor 248 which are coupled to the timing inputs of monostable 244. VDD is also connected to the clear input terminal of monostable 244. The Q2 terminal of monostable 244 is coupled to the D input terminal of a data flip-flop 250.

The PBO output of computer 214 is also coupled to the clock input of D flip-flop 250. The set input of the data flip-flop 250 is connected to ground. Flip-flop 250 is preferably one-half of an IC designated MC14013. The Q output of flip-flop 250 provides the control signal output of audio/data select circuit 216 which is supplied to transmission gates 206 and causes the selective activation of one of the gates depending upon whether either the audio or data information is to be supplied to the modulating input of the transmitter.

When it is desired to transmit an audio signal, the encoder for the present embodiment is designed to respond to the presence of a 600 Hz signal so that the activation of an external microphone or other voice storage and forwarding device may be achieved to insert the voice message into the transmission at the appropriate time. There are several other reasons for using various squarewave signals at predetermined frequencies but with respect to the present invention only the presence of a 600 Hz signal is used for this specific purpose.

Audio data selection circuit 216 operates as a tone detector in which OR gate 240 is triggered on the detection of a squarewave signal edge to produce a relatively long duration output pulse at the Q2 output terminal of monostable 244. This signal is supplied to the D input of the flip-flop which is also coupled directly to the PBO output of computer 214 through its clock terminal. If the long duration pulse from the monostable continues during the time that a subsequent squarewave signal edge is detected from the PBO



output of the computer, data flip-flop 250 is either maintained at or is toggled to the 1 logic level output at its Q terminal. This indicates detection of the 600 Hz signal. Termination of the long duration pulse from the monostable before an edge occurs at the clock terminal of the data flip-flop would cause it to toggle to zero or maintain it at zero thus indicating that no 600 Hz audio signal had been selected and therefore no audio signal was to be transmitted.

Figure 6 represents the flowchart for the firmware operation of the encoder shown in Figures 4 and 5. When the encoder is activated, it goes through an initialization routine in which all registers are set so that the program can be loaded and executed. After initialization, control is transferred to a decision block at which time the operator selects control mode. There are three possible control modes; first is the selection of multiple queue transmissions; the second is the selection of single queue transmissions; and most importantly the third is the selection of the block number and type of information to be transmitted.

The block number allows the operator to select in a given message sequence exactly where information is to be inserted. The type of information refers directly to the coding system utilized and allows the operator to select the preamble number and the duration of the preamble signal and to select the first and second address words for the echo coding system of the preferred embodiment. Completion of this operation establishes the addresses of the pagers which can be paged. In normal operation, subscriber addresses would be maintained in a memory file status so that individual pagers could be correctly addressed.

The next operator choice is the selection of whether or not to specify numeric data information which produces a block of numeric data suitable for transmission to a numeric or data pager. The last operator selection is a frequency signal which for the preferred GSC coding embodiment is indicative of a tone and voice operation for pagers. This has already been described in detail.

At the conclusion of the selection of the four types of information, control is transferred to a decision block to determine whether or not all of the selections are completed. If not, the control of the operation is again returned to the select block of number and type operation at which time additional locations for blocks of information may be selected and additional types designated. The selection of the block number and type of information and whether or not the message is to be data tone only or tone and voice would be made for each block of information. After all of the decisions are made and the operator is finished with the block selection, control of the operation is returned to the select mode decision block at which time the operator can choose among the three possible mode operations including adding additional information to the assemblage of blocks and information.

The selection of multiple queue transmissions or single queue transmissions enable information of the designated blocks in sequences of information to be sent singly, that is in one transmission, or to be repeated a number of times. Normally, only the single queue transmission would be used, however for the purpose of sending extremely long messages, the use of a redundancy can be built in to ensure even greater reliability of the reception of long complex messages.

At the conclusion of the select queue operation for the transmission, control is transferred to the transmit decision block. If at this time the operator elects no transmission, operation of the program is again returned to the select control mode. If the operator chooses to transmit, control is transferred to the start timer operation.

The start timer operation takes the blocks of information and formats them into various transmission patterns. At regular intervals of 1200 times per second, the information storage buffers in which the information has been formatted are accessed by a timer interrupt routine which takes the output of a given buffer and provides one bit of information to a sequence control operation so that the transmission pattern may be sent out one bit at a time. At the end of each interruption, control of the program returns to the formatting operation at which time additional information may be loaded into the buffers.

In operation the format control takes the blocks of information as designated and selected and loads them into temporary storage buffers so that they may be emptied on a time interrupt bit by bit basis and provided to the transmitter. The output from the transmitter is digital logic signals superimposed on a carrier at the rate of 1200 bits per second.

As the various information storage buffers are emptied on a bit for bit basis, the formatting routine continues to load the additional selected information. The buffers may be drained serially to produce the message sequence. At the end of the information in the last stored buffer, the decision to end transmission is made. If it is not the end of the transmission, control is returned to the formatting block so that additional transmission patterns may be loaded into the information storage buffers so that they may be accessed to provide the information for the transmission. If the decision from the end of transmission decision block is to stop, then a stop timer routine is activated at which time control is transferred back to the select control mode operation.

Included with this primary flowchart is a separate secondary flowchart for the timer interrupt routine which on a regular 1200 times per second basis interrogates the information sequence stored in the storage buffers and provides an output to the transmitter. At the conclusion of the transfer of each bit of information control of the operation is transferred back to the formatting operation in the primary flowchart.

Table 2 shows the hexadecimal core dump of the entire firmware coding program consistent with the

language appropriate for the computer shown in Figure 4. Loading of this code into the ROM will provide the operation described by the flowchart in Figure 6.

5

TABLE 2

	3000	8E	F0	90	BD	D4	A7	8E	00	00	A6	0A	81	30	27	03	BD
	3010	D4	B4	A5	0B	BD	D4	B4	85	2E	BD	D4	B4	9E	11	A6	84
10	3020	84	F0	81	F0	27	09	8E	F0	6B	BD	D4	A7	7E	D3	93	9E
	3030	11	A6	84	84	0F	1F	89	4D	48	34	04	AB	E0	8E	D0	54
	3040	9F	18	D6	19	34	04	AB	E0	97	19	D6	19	C9	00	D7	18
	3050	9E	18	6E	84	7E	D1	4C	7E	D0	94	7E	D1	C0	7E	D1	FB
15	3060	7E	D0	D0	7E	D2	61	7E	D2	A7	7E	D2	CB	7E	D2	E2	7E
	3070	D3	14	7E	D0	26	7E	D0	26	7E	D0	26	7E	D0	26	7E	D0
	3080	26	7E	D0	26	8E	F0	89	BI	D4	A7	9E	11	A6	02	BD	D4
	3090	B4	A6	03	BD	D4	B4	A6	04	BD	D4	B4	A6	05	BD	D4	B4
20	30A0	A6	06	BD	D4	B4	A6	07	BI	D4	B4	86	2E	BD	D4	B4	A6
	30B0	01	85	01	26	0A	9E	11	A6	01	85	02	26	0A	20	0E	8E
	30C0	F0	A1	BD	D4	A7	20	EE	8E	F0	C0	BD	D4	A7	7E	D3	93
	30D0	8E	F0	E2	BD	D4	A7	9E	11	A6	02	84	0F	81	01	27	11
25	30E0	81	02	27	12	81	04	27	13	81	08	27	14	8E	F1	11	20
	30F0	12	8E	F0	F6	20	0D	8E	F0	FD	20	08	8E	F1	04	20	03
	3100	8E	F1	0B	BD	D4	A7	8E	F1	19	BD	D4	A7	8E	F1	25	BD
	3110	D4	A7	9E	11	A6	01	BD	D4	B4	86	2E	BD	D4	B4	8E	F1
30	3120	3E	BD	D4	A7	BD	D1	30	8E	F1	54	BD	D4	A7	7E	D3	93
	3130	0E	11	A6	03	BD	D4	B4	A6	04	BD	D4	B4	A6	05	BD	D4
	3140	B4	A6	06	BD	D4	B4	A6	07	BD	D4	B4	39	8E	F1	5E	BD
	3150	D4	A7	9E	11	A6	02	BD	D4	B4	A6	03	BD	D4	B4	A6	03
35	3160	85	01	26	07	86	2E	BD	D4	B4	20	06	8E	F1	6C	BD	D4
	3170	A7	9E	11	A6	01	85	01	27	06	8E	F1	77	BD	D4	A7	8E
	3180	F1	8C	BD	D4	A7	9E	11	A6	03	85	01	26	2A	A6	07	BD
	3190	D4	B4	9E	11	A6	06	85	02	26	07	86	2E	BD	D4	B4	20
40	31A0	06	8E	F1	6C	BD	D4	A7	9E	11	A6	01	85	02	27	0E	8E
	31B0	F1	77	BD	D4	A7	20	06	8E	F1	9C	BD	D4	A7	7E	D3	93
	31C0	8E	F1	A2	BD	D4	A7	9E	11	86	06	97	1A	A6	02	BD	D3
	31D0	3A	30	01	0A	1A	26	F5	86	2E	BD	D4	B4	9F	11	A6	01
	31E0	85	04	27	06	8E	F1	B6	BD	D4	A7	9E	11	A6	01	85	01
45	31F0	27	06	8E	F1	77	BD	D4	A7	7E	D3	93	8E	F1	DB	BD	D4
	3200	A7	8E	F1	A6	BD	D4	A7	8E	00	1B	9F	21	9E	11	9F	23
	3210	9E	23	A6	02	30	01	9F	23	9E	21	A7	84	30	01	9F	21
	3220	8C	00	21	26	EB	C6	08	8E	00	1B	4F	69	84	49	30	01
50	3230	8C	00	21	26	F6	8B	20	BD	D4	B4	5A	2E	EA	86	2E	BD
	3240	D4	B4	9E	11	A6	01	85	04	27	06	8E	F1	B6	BD	D4	A7
	3250	9E	11	A6	01	85	01	27	06	8E	F1	77	BD	D4	A7	7E	D3
	3260	93	8E	F1	E6	BD	D4	A7	8E	F2	02	BD	D4	A7	9E	11	6D
55	3270	01	27	11	86	24	BD	D4	B4	A6	01	BD	D3	3A	86	2E	BD
	3280	D4	B4	20	06	8E	F1	9C	BD	D4	A7	8E	F1	3E	BD	D4	A7
	3290	9E	11	C6	05	A6	03	BD	D4	B4	30	01	5A	2E	F6	8E	F1
	32A0	54	BD	D4	A7	7E	D3	93	8E	F2	13	BD	D4	A7	9E	11	A6
60	32B0	01	BD	D4	B4	86	2E	BD	D4	B4	8E	F1	3E	BD	D4	A7	BD
	32C0	D1	30	8E	F1	54	BD	D4	A7	7E	D3	93	8E	F2	26	BD	D4
	32D0	A7	8E	F1	3E	BD	D4	A7	BD	D3	81	86	2E	BD	D4	B4	7E
	32E0	D3	93	8E	F2	39	BD	D4	A7	9E	11	A6	03	BD	D4	B4	8E
65	32F0	F1	6C	BD	D4	A7	8E	F2	4F	BD	D4	A7	BD	D3	81	86	2E

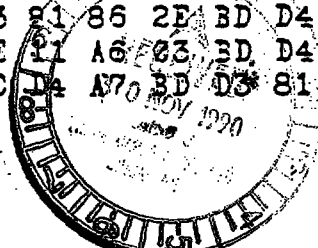
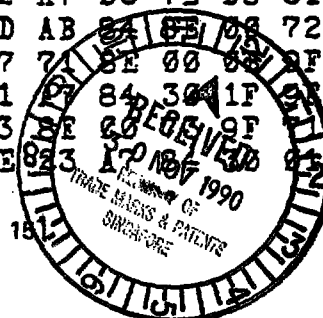


TABLE 2 (contd.)

5	3300	BD	D4	B4	9E	11	A6	01	E5	01	27	06	8E	F2	7A	BD	D4
	3310	A7	7E	D3	93	8E	F2	A5	BE	D4	A7	9E	11	A6	04	BD	D4
	3320	B4	BD	D3	81	86	2E	BD	D4	B4	9E	11	A6	01	85	01	27
	3330	06	8E	F1	77	BD	D4	A7	7E	D3	93	34	02	84	0F	BD	D3
	3340	43	35	02	44	44	44	44	BD	D3	4B	39	81	0D	27	18	81
10	3350	0E	27	18	81	0A	27	18	81	0B	27	18	81	00	27	18	81
	3360	0C	27	18	8A	30	20	16	86	20	20	12	86	2D	20	0E	86
	3370	30	20	0A	86	2F	20	06	86	45	20	02	86	00	BD	D4	B4
	3380	39	9E	11	A6	05	BD	D4	B4	A6	06	BD	D4	B4	A6	07	BD
15	3390	D4	B4	39	BD	D5	31	39	8E	00	84	6F	84	30	01	8C	01
	33A0	6B	26	F7	8E	00	90	9F	9C	9F	9E	86	0F	97	9B	8E	DE
	33B0	D4	9F	A0	86	98	97	7F	4C	97	7E	97	7D	7F	EC	18	B6
	33C0	EC	19	BE	EC	1C	12	1C	IF	96	80	9A	81	9A	82	26	15
20	33D0	96	90	9A	91	9A	92	9A	93	26	F6	12	1A	10	86	01	B7
	33E0	EC	18	7E	D5	31	8E	00	03	1A	01	A5	89	00	7F	A9	89
	33F0	00	7C	19	A7	89	00	7F	30	1F	26	EF	8E	E2	00	9F	11
	3400	9E	11	A6	84	84	F0	81	F0	26	BE	A6	84	8E	D4	24	9F
25	3410	86	84	0F	48	9B	87	97	87	96	86	89	00	97	86	9E	86
	3420	AE	84	6E	84	D4	38	DC	01	D9	69	D4	38	D7	9F	D4	38
	3430	D4	38	D4	38	D7	3A	D4	38	96	12	8B	08	97	12	96	11
	3440	89	00	97	11	7E	D4	00	12	1A	10	10	CE	E1	FF	8E	DE
30	3450	6A	EF	FF	F8	86	03	B7	90	02	86	04	B7	90	03	86	C1
	3460	B7	EC	19	8E	00	07	BF	EC	1C	86	03	B7	EC	14	86	91
	3470	B7	EC	14	86	00	97	83	8E	F8	34	9F	0C	AE	84	AD	84
	3480	20	FA	B6	EC	14	47	24	FA	B6	EC	15	84	7F	34	04	F6
35	3490	EC	14	57	57	24	F9	B7	EC	15	35	04	39	BD	D5	31	AE
	34A0	84	8D	04	BD	D5	31	39	A6	84	81	04	27	06	8D	05	30
	34B0	01	20	F4	39	D6	83	C5	40	27	1E	34	02	81	0A	27	09
	34C0	86	00	BD	D4	8D	35	02	20	0F	86	32	97	17	86	00	BD
40	34D0	D4	8D	0A	17	26	F9	35	02	BD	D4	8D	39	BD	D5	31	9F
	34E0	15	BD	D5	31	E6	64	C1	04	27	1B	BD	D4	82	97	0E	C1
	34F0	01	27	21	34	04	A1	E0	27	14	30	01	30	01	30	01	E6
45	3500	84	C1	04	26	EE	9E	15	BE	D5	3A	39	20	E6	BD	D5	35
	3510	BD	D5	3A	39	30	01	A1	84	25	0F	30	01	A1	84	22	D9
	3520	9F	0C	BD	D5	2D	BD	D5	3A	39	30	01	20	CC	9E	0C	20
	3530	04	9E	0C	30	01	30	01	9F	0C	39	AE	84	9F	0C	39	9E
	3540	0C	A6	09	34	02	A6	08	34	02	A6	07	34	02	A6	06	34
50	3550	02	A6	05	34	02	A6	04	34	02	30	01	30	01	BD	D5	3A
	3560	7E	D4	7C	1F	41	AE	02	20	0A	1F	41	AE	04	20	04	1F
	3570	41	AE	06	32	61	32	61	32	61	32	61	32	61	32	61	32
	3580	61	32	61	9F	0C	39	8E	00	73	6F	84	30	01	8C	00	7B
55	3590	26	F7	7E	D5	31	BE	D5	9D	9F	25	7E	D5	31	31	38	8E
	35A0	00	73	86	F0	A7	84	96	25	A7	02	BD	D4	B4	96	26	A7
	35B0	03	BD	D4	B4	BD	D5	31	85	01	27	03	7E	D5	3A	7E	D5
	35C0	31	86	F1	97	73	7E	D5	31	8E	00	73	A6	01	8A	01	A7
60	35D0	01	7E	D5	31	8E	00	73	A6	01	8A	02	A7	01	7E	D5	31
	35E0	8E	00	73	A6	06	8A	02	A7	06	7E	D5	31	BD	D5	31	A6
	35F0	84	1F	89	4D	BD	D5	2D	AB	84	0E	08	72	9F	71	99	72
65	3600	97	72	96	71	89	00	97	7A	8E	00	08	0F	7B	9E	7B	A6
	3610	84	30	1F	9F	7B	9E	71	8E	00	08	0F	7B	9E	7B	A6	ED
	3620	7E	D5	2D	9E	11	9F	23	8E	00	08	0F	7B	9E	7B	A6	ED
	3630	A6	84	30	01	9F	71	9E	8E	00	08	0F	7B	9E	7B	A6	ED



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TABLE 2 (contd.)

5	3640	ED	7E	D5	31	8E	00	73	86	04	AA	01	A7	01	7E	D5	31
	3650	8E	00	00	9F	7B	8E	00	73	9F	71	0F	1A	C6	0C	9E	7B
	3660	A6	84	5A	30	01	9F	7B	81	00	26	04	0C	1A	20	EF	81
	3670	20	26	04	86	0D	20	22	81	2D	26	04	86	0E	20	1A	81
10	3680	30	26	04	86	0A	20	12	81	2F	26	04	86	0B	20	0A	81
	3690	45	26	04	86	00	20	02	84	0F	9E	71	34	04	D0	1A	C5
	36A0	01	27	04	A7	02	20	0C	48	48	48	48	AA	02	A7	02	30
	36B0	01	9F	71	35	04	5D	2E	A6	D6	1A	5A	C5	01	27	06	86
	36C0	0C	A7	02	20	03	86	C0	AA	02	A7	02	30	01	5D	2E	EA
15	36D0	7E	D5	31	86	F2	97	73	7E	D5	31	8E	00	04	9F	7B	A6
	36E0	84	27	02	80	20	30	01	9F	7B	8E	00	75	48	48	49	69
	36F0	84	30	01	8C	00	7B	26	F6	9E	7B	8C	00	0C	26	E0	7E
	3700	D5	31	86	F3	97	73	7E	D5	31	3D	D5	31	A6	84	97	75
20	3710	7E	D5	2D	86	F4	97	73	7E	D5	31	96	0E	97	74	7E	D5
	3720	31	86	F3	97	73	7E	D5	31	96	0E	97	76	7E	D5	31	0F
	3730	80	0F	81	86	01	97	82	7E	D5	31	3D	DC	28	8D	16	8D
	3740	35	BD	DD	D1	BD	DC	D4	0A	1A	27	05	BD	DC	28	20	F1
25	3750	0F	85	7E	D4	38	9E	11	A6	03	84	0F	48	8E	D7	EB	9F
	3760	86	9B	87	97	87	96	86	89	00	97	86	9E	86	A6	84	97
	3770	30	A6	01	97	B4	39	9E	11	A6	06	84	0F	BD	D8	93	48
	3780	E6	07	C4	0F	34	04	AB	E0	97	1A	39	77	E0	88	10	E4
30	3790	10	70	A0	FD	00	CF	30	F1	70	37	90	18	60	98	80	BD
	37A0	DC	28	8D	05	0F	85	7E	D4	38	9E	11	86	40	E6	01	C5
	37B0	01	27	02	8A	80	E6	02	C4	0F	34	04	AB	E0	9E	9E	A7
	37C0	84	8E	00	B0	6F	84	30	01	8C	00	C0	26	F7	9E	11	A6
35	37D0	04	84	0F	8E	00	B0	A7	05	30	01	BD	DD	A3	BD	DD	A3
	37E0	BD	DD	AB	9E	11	A6	05	84	0F	8E	00	B0	A7	04	BD	DD
	37F0	AB	BD	DD	AB	BD	DD	9E	9E	11	A6	06	84	0F	8E	00	B0
	3800	A7	04	6F	84	BD	DD	AB	BD	DD	9E	9E	11	A6	07	84	0F
40	3810	8E	00	B0	AB	05	A7	05	A6	01	89	00	A7	01	9E	9E	96
	3820	B1	A7	04	96	B5	A7	08	39	8E	00	0C	C6	0C	86	00	30
	3830	1F	A7	84	5A	2E	F9	BD	D5	31	39	96	0E	81	0D	27	12
	3840	8E	00	00	A6	01	A7	84	30	01	8C	00	0B	26	F5	96	0E
45	3850	97	03	BD	D5	31	39	4F	97	0F	97	10	8E	00	00	A6	09
	3860	01	00	26	08	A6	0A	81	00	26	0E	27	15	80	30	8D	23
	3870	8D	21	48	48	97	10	A6	0A	80	30	8D	17	48	9B	10	97
	3880	10	A6	0B	80	30	99	10	97	10	96	0F	89	00	97	0F	BD
50	3890	D5	31	39	1F	89	4D	48	48	34	04	AB	E0	39	8E	E2	00
	38A0	86	F4	A7	84	30	01	86	30	A7	84	30	01	86	32	A7	84
	38B0	30	01	86	00	A7	84	30	01	A7	84	30	01	86	32	A7	84
	38C0	30	01	86	34	A7	84	30	01	86	32	A7	84	30	01	8C	E5
55	38D0	20	26	CD	8E	E2	00	9F	11	9F	13	6F	84	BD	D5	31	39
	38E0	96	10	D6	0F	48	48	59	48	59	8B	00	97	12	C9	E2	D7
	38F0	11	BD	D5	31	39	96	13	91	11	22	36	25	06	96	14	91
	3900	12	22	2E	86	F4	9E	13	A7	84	86	30	A7	01	86	32	A7
60	3910	02	86	00	A7	03	A7	04	86	32	A7	05	A7	07	86	34	A7
	3920	06	96	12	8B	08	97	14	96	11	89	00	97	13	9E	13	6F
	3930	84	BD	D5	31	39	0F	80	0F	01	8D	0F	97	81	30	01	30
	3940	06	8D	15	97	80	30	01	8D	0F	01	8D	0F	E6	01	C4	0F
65	3950	01	8D	05	97	82	7E	D5	0F	01	8D	0F	01	8D	0F	01	8D
	3960	48	48	48	48	34	04	A7	0F	01	8D	0F	01	8D	0F	01	8D

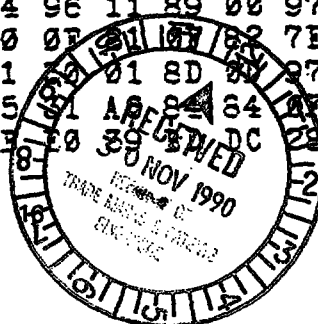


TABLE 2 (contd.)

	3970	DA	08	BD	DA	8D	BD	DA	A6	BD	DA	DF	BD	D9	C7	BD	DC
	3980	28	BD	D9	DC	BD	DB	74	0F	85	7E	D4	38	7F	01	60	8E
5	3990	01	54	EF	01	50	9E	11	30	01	BF	01	52	A6	84	81	04
	39A0	26	05	86	40	B7	01	60	BE	01	52	A6	01	BE	01	50	A7
	39B0	84	30	01	8C	01	5A	27	0E	BF	01	50	BE	01	52	30	01
	39C0	BF	01	52	7E	D9	A7	39	86	42	0D	B0	23	02	8A	80	9E
10	39D0	9E	A7	84	86	02	9B	85	A7	08	6F	04	39	8E	00	B0	BF
	39E0	01	40	9E	88	BF	01	42	BE	01	40	A6	84	BE	01	42	A7
	39F0	84	A7	01	7C	01	41	BE	01	40	8C	00	BF	27	09	7C	01
	3A00	43	7C	01	43	7E	D9	E7	39	8E	01	5A	6F	84	30	01	8C
15	3A10	01	60	26	F7	30	01	6F	84	8E	01	54	A6	84	A7	06	48
	3A20	69	07	30	01	A6	84	48	69	07	AB	06	A7	06	48	69	07
	3A30	30	01	A6	84	48	69	07	48	69	07	AB	06	A7	06	48	69
	3A40	07	30	01	A6	84	48	48	48	AB	06	A7	06	8E	01	59	A6
20	3A50	84	44	66	06	44	66	06	66	06	AB	07	A7	07	30	1F	A6
	3A60	84	44	66	06	44	66	06	44	66	06	66	06	AB	07	A7	07
	3A70	30	1F	A6	84	44	44	44	44	AB	07	A7	07	8E	01	5A	A6
	3A80	84	84	7F	A7	84	30	01	8C	01	5E	26	F3	39	5F	4F	8E
25	3A90	01	5B	A6	84	BB	01	5A	30	01	AB	84	5C	C1	06	26	F7
	3AA0	84	7F	B7	01	61	39	8E	01	5A	BF	01	46	7F	01	48	7F
	3AB0	01	49	5F	8E	DB	81	BF	01	48	BF	01	46	A6	84	BB	01
	3AC0	49	B7	01	49	F9	01	48	F7	01	48	BE	01	48	A6	84	BE
30	3AD0	01	46	A7	08	30	01	BF	01	46	8C	01	6A	26	D4	39	8E
	3AE0	00	B0	6F	84	30	01	8C	00	BF	26	F7	8E	00	B0	BF	01
	3AF0	4A	C6	01	F7	01	4C	8E	01	5A	C6	80	F7	01	4D	A6	84
	3B00	B4	01	4C	27	10	BF	01	4E	BE	01	4A	F6	01	4D	EB	84
35	3B10	E7	84	BE	01	4E	30	01	74	01	4D	7D	01	4D	26	DF	7D
	3B20	01	4C	23	0E	BE	01	4A	30	01	BF	01	4A	78	01	4C	7E
	3B30	DA	F6	86	01	B7	01	4C	8E	01	62	86	80	B7	01	4D	A6
	3B40	84	B4	01	4C	27	10	BF	01	4E	BE	01	4A	F6	01	4D	EB
	3B50	84	E7	84	BE	01	4E	30	01	74	01	4D	7D	01	4D	26	DF
40	3B60	7D	01	4C	23	0E	BE	01	4A	30	01	BF	01	4A	78	01	4C
	3B70	7E	DB	37	39	86	20	9E	9E	A7	84	86	F0	A7	09	6F	04
	3B80	39	00	17	2E	39	5C	4B	72	65	B8	AF	96	81	E4	F3	CA
	3B90	DD	67	70	49	5E	3B	2C	15	02	DF	C8	F1	E6	83	94	AD
45	3BA0	BA	CE	D9	E0	F7	92	85	BC	AB	76	61	58	4F	2A	3D	04
	3BB0	13	A9	BE	87	90	F5	E2	DB	CC	11	06	3F	28	4D	5A	63
	3BC0	74	8B	9C	A5	B2	D7	C0	F9	EE	33	24	1D	0A	6F	78	41
	3BD0	56	EC	FB	C2	D5	B0	A7	9E	89	54	43	7A	6D	08	1F	26
50	3BE0	31	45	52	6B	7C	19	0E	37	20	FD	EA	D3	C4	A1	B6	8F
	3BF0	98	22	35	0C	1B	7E	69	50	47	9A	8D	B4	A3	C6	D1	E8
	3C00	FF	8D	25	BD	DC	57	BD	DC	8D	8D	1D	BD	DC	A6	BD	DC
	3C10	D4	8D	15	BD	DD	1D	BD	DD	BE	8D	0D	BD	DD	D1	BD	DC
55	3C20	D4	86	00	97	85	7E	D4	38	9E	9E	30	01	8C	00	94	26
	3C30	03	8E	00	90	9F	9E	8E	00	C0	9F	88	96	9F	80	90	48
	3C40	48	49	48	48	9B	89	97	89	96	88	89	00	97	88	9E	9E
	3C50	A6	04	AA	08	26	FA	39	9E	11	A6	04	84	0F	BD	D8	93
60	3C60	48	E6	05	C4	0F	34	04	AB	E0	1F	89	4D	54	24	06	C6
	3C70	80	DA	83	20	04	C6	7F	D4	83	D7	83	8E	DE	06	9F	8E
	3C80	84	FE	9B	8F	97	8F	96	8E	89	00	97	8E	39	86	42	9E
	3C90	8E	E6	84	D8	83	2A	02	8A	80	9E	9E	A7	84	86	38	9B
65	3CA0	85	A7	08	6F	04	39	86	10	9E	9E	A7	84	86	5C	A7	08

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TABLE 2 (contd.)

5	3CB0	6F	04	9E	8E	A6	84	9E	88	0D	83	2A	01	43	A7	84	A7
	3CC0	01	9E	8E	A6	01	9E	88	0D	83	2A	02	83	F0	A7	04	A7
	3CD0	05	6F	09	39	C6	0C	8E	DD	EE	9F	86	9E	88	68	04	69
	3CE0	84	24	14	9E	86	A6	84	9F	82	A8	05	A7	05	9E	86	A6
	3CF0	01	9E	88	A8	09	A7	09	9E	86	30	01	30	01	9F	86	5A
10	3D00	2E	D9	9E	88	A6	01	A7	84	A7	02	A7	03	A6	05	A7	04
	3D10	A7	06	A7	07	A6	09	A7	08	A7	0A	A7	03	39	8E	00	B0
	3D20	6F	84	30	01	8C	00	C0	26	F7	9E	11	A6	02	84	0F	8E
	3D30	00	B0	A7	05	30	01	BD	DD	AB	BD	DD	AB	BD	DD	AB	9E
15	3D40	11	A6	03	84	0F	8E	00	B0	A7	04	8D	5F	8D	5D	8D	4E
	3D50	9E	11	A6	06	84	0F	8E	00	B0	A7	04	6F	84	8D	4C	8D
	3D60	3D	9E	11	A6	07	84	0F	8E	00	B0	AB	05	A7	05	A6	01
	3D70	89	00	A7	01	68	05	69	01	68	05	69	01	68	05	69	01
20	3D80	A6	05	85	08	27	04	63	01	88	F0	84	F0	A7	05	C6	0C
	3D90	6F	84	69	05	69	01	66	84	66	04	5A	2E	F5	39	A6	04
	3DA0	AB	05	A7	05	A6	84	A9	01	A7	01	39	A6	04	E6	84	48
	3DB0	59	48	59	AB	04	E9	84	48	59	A7	04	E7	84	39	86	42
25	3DC0	0D	B0	2B	02	8A	80	9E	9E	A7	84	86	02	A7	08	6F	04
	3DD0	39	9E	9E	86	10	A7	84	86	5C	A7	03	6F	04	9E	88	96
	3DE0	B0	A7	84	A7	01	96	B4	A7	04	A7	05	6F	09	39	0A	E2
	3DF0	0F	92	0D	2A	0C	76	0C	D8	06	6C	03	36	0B	78	05	BC
30	3E00	02	DE	0B	8C	05	C6	93	40	C0	50	11	D0	D6	A0	54	60
	3E10	35	60	5A	50	C3	60	28	50	06	A0	21	50	1D	40	C1	60
	3E20	1B	70	07	30	06	B0	16	A0	D0	70	36	C0	2C	30	B7	10
	3E30	0C	50	C1	C0	26	70	9C	30	32	10	E0	A0	1C	50	F6	60
35	3E40	09	30	EE	80	0B	20	10	D0	0C	E0	19	80	EC	30	DC	E0
	3E50	4E	C0	31	B0	C3	30	E4	60	E1	B0	0A	30	30	50	27	20
	3E60	04	50	08	60	C2	C0	05	A0	05	00	36	90	02	84	FE	8A
	3E70	02	D6	84	C4	01	34	04	AE	E0	D6	83	C5	20	27	02	88
40	3E80	01	F7	90	02	F6	EC	19	BE	EC	1C	9E	9C	F6	08	C0	01
	3E90	F7	08	E6	04	C2	00	E7	04	84	FD	B7	90	02	EA	08	27
	3EA0	07	9E	A0	AE	88	10	6E	84	86	00	A7	84	30	01	8C	00
	3EB0	94	26	03	8E	00	90	9F	9C	A6	84	84	70	44	44	44	8E
45	3EC0	DE	D4	9F	A0	9B	A1	97	A1	96	A0	89	00	97	A0	9E	A0
	3ED0	AE	84	6E	84	DE	F4	DE	F5	DF	14	DF	14	DF	37	00	00
	3EE0	00	00	00	00	DE	F4	DF	4B	DF	69	DF	69	DF	99	00	00
	3EF0	00	00	00	00	3B	8E	00	C0	9F	8A	96	9D	80	90	48	48
50	3F00	48	48	48	9B	8B	97	8B	97	8D	96	8A	89	00	97	8A	97
	3F10	8C	7E	DE	A1	8E	00	C0	9F	8A	96	9D	80	90	48	48	48
	3F20	48	48	9B	8B	97	8B	96	8A	89	00	97	8A	86	80	B7	01
	3F30	44	7F	01	45	7E	DE	A1	9E	9C	A6	84	84	0F	97	A2	97
	3F40	A3	A6	84	84	80	40	09	84	7E	DE	A1	9E	8A	68	08	69
55	3F50	04	69	84	09	84	30	01	96	8D	8B	04	D6	8B	5C	34	04
	3F60	A1	E0	26	02	9E	8C	9F	8A	3B	9E	8A	7D	01	44	2B	0C
	3F70	69	01	09	84	86	80	B7	01	44	7E	DF	83	68	84	09	84
	3F80	7F	01	44	7C	01	45	36	01	45	81	10	26	0B	7F	01	45
60	3F90	9E	8A	30	01	30	01	9F	8A	3B	0D	A3	26	06	96	A2	97
	3FA0	A3	03	84	0A	A3	3B	00	00	00	00	00	00	00	00	00	00
	3FB0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	3FC0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
65	3FD0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

TABLE 2 (contd.)

	3FE0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
5	3FF0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	4000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	4010	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	4020	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
10	4030	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	4040	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	4050	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	4060	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
15	4070	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	4080	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	4090	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	40A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	40B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	40C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	40D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	40E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
25	40F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	4100	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	4110	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30	5000	0D	0A	0A	0A	45	43	48	4F	20	54	45	53	54	20	45	4E
	5010	43	4F	44	45	52	0D	0A	4D	4F	54	4F	52	4F	4C	41	20
	5020	20	20	4A	41	4E	20	31	39	38	31	04	0D	0A	0A	55	4E
	5030	46	4F	52	4D	41	54	54	45	44	20	53	59	53	54	45	4D
	5040	2E	04	0D	0A	0A	45	4E	54	45	52	20	41	20	42	4C	4F
35	5050	43	43	20	50	4F	53	49	54	49	4F	4E	20	46	52	4F	4D
	5060	20	30	20	54	4F	20	39	39	3A	20	04	0D	0A	20	20	42
	5070	4C	4F	43	4B	20	55	4E	44	45	46	49	4E	45	44	2E	04
	5080	0D	0A	42	4C	4F	43	43	20	04	0D	0A	20	20	41	44	44
	5090	52	45	53	53	20	43	41	50	20	43	4F	44	45	20	3D	20
40	50A0	04	0D	0A	20	20	45	52	52	4F	52	53	20	49	4E	43	4C
	50B0	55	44	45	44	20	49	4E	20	57	4F	52	44	20	31	2E	04
	50C0	0D	0A	20	20	45	52	52	4F	52	53	20	49	4E	43	4C	55
	50D0	44	45	44	20	49	4E	20	57	4F	52	44	20	32	2E	04	0D
45	50E0	0A	04	0D	0A	20	20	53	51	55	41	52	45	20	57	41	56
	50F0	45	20	4F	46	20	04	36	30	30	20	48	5A	04	33	30	30
	5100	20	48	5A	04	31	35	30	20	48	5A	04	37	35	20	48	5A
	5110	04	49	4C	4C	45	47	41	4C	04	20	45	52	45	51	55	45
50	5120	4E	43	59	2E	04	0D	0A	20	20	53	54	41	52	54	49	4E
	5130	47	20	50	4F	4C	41	52	49	54	59	20	3D	20	04	0D	0A
	5140	20	20	42	4C	4F	43	4B	20	44	55	52	41	54	49	4F	4E
	5150	20	3D	20	04	20	53	41	4D	50	4C	45	53	2E	04	0D	0A
55	5160	20	20	53	59	4E	43	20	3D	20	04	20	20	20	49	4E	56
	5170	45	52	54	45	44	2E	04	0D	0A	20	20	45	52	52	4F	52
	5180	53	20	49	4E	43	4C	55	44	45	44	2E	04	0D	0A	20	20
	5190	47	52	4F	55	50	20	49	44	20	3D	20	04	4E	4F	4E	45
60	51A0	2E	04	0D	0A	20	20	4E	55	4D	45	52	49	43	20	44	41
	51B0	54	41	20	3D	20	04	0D	0A	20	20	4D	45	53	53	41	47
	51C0	45	20	43	4F	4E	54	49	4E	55	45	44	20	49	4E	20	4E
	51D0	45	58	54	20	42	4C	4F	43	4B	2E	04	0D	0A	20	20	41
	51E0	4C	50	48	41	2D	04	0D	0A	20	20	50	53	45	55	44	4F
65	51F0	2D	52	41	4E	44	4F	4D	20	53	45	51	55	45	4E	43	45

TABLE 2 (contd.)

5	5200	2E	04	0D	0A	20	20	53	45	45	44	20	42	59	54	45	20
	5210	3D	20	04	0D	0A	20	20	4C	4F	47	49	43	20	4C	45	56
	5220	45	4C	20	3D	20	04	0D	0A	20	20	53	41	4D	50	4C	45
	5230	20	53	54	52	49	4E	47	2E	04	0D	0A	20	20	50	52	45
10	5240	41	4D	42	4C	45	20	57	4F	52	44	20	3D	20	20	04	0D
	5250	0A	20	20	4E	55	4D	42	45	52	20	4F	46	20	53	45	51
	5260	55	45	4E	54	49	41	4C	20	50	52	45	41	4D	42	4C	45
	5270	20	57	4F	52	44	53	20	3D	20	04	0D	0A	20	20	45	52
	5280	52	4F	52	53	20	49	4E	43	4C	55	44	45	44	20	49	4E
15	5290	20	45	41	43	48	20	50	52	45	41	4D	42	4C	45	20	57
	52A0	4F	52	44	2E	04	0D	0A	20	20	53	49	4E	47	4C	45	20
	52B0	45	43	48	4F	20	57	4F	52	44	20	3D	20	04	0D	0A	20
	52C0	20	43	48	41	4E	47	45	20	28	59	2F	4E	29	3F	20	04
20	52D0	0D	0A	0A	20	20	53	45	4C	45	43	54	3A	0D	0A	20	20
	52E0	20	31	20	2D	20	41	44	44	52	45	53	53	20	43	45	4C
	52F0	4C	2E	0D	0A	20	20	20	32	20	2D	20	4E	55	4D	45	52
	5300	49	43	20	44	41	54	41	20	43	45	4C	4C	2E	0D	0A	20
25	5310	20	20	33	20	2D	20	50	52	45	41	4D	42	4C	45	2E	0D
	5320	0A	20	20	20	34	20	2D	20	53	51	55	41	52	45	20	57
	5330	41	55	45	2E	0D	0A	04	0D	0A	20	20	20	3F	20	04	0D
	5340	0A	0A	20	20	53	59	4E	43	20	57	4F	52	44	20	3D	20
30	5350	04	2E	04	0D	0A	20	20	49	4E	43	4C	55	44	45	20	45
	5360	52	52	4F	52	53	20	28	59	2F	4E	29	3F	20	04	0D	0A
	5370	20	20	45	4E	54	45	52	20	47	52	4F	55	50	20	49	44
	5380	20	57	4F	52	44	20	28	31	20	44	49	47	49	54	29	3A
35	5390	20	04	0D	0A	20	20	49	4E	56	45	52	54	20	28	59	2F
	53A0	4E	29	3F	20	04	0D	0A	20	20	45	4E	54	45	52	20	41
	53B0	44	44	52	45	53	53	20	43	41	50	20	43	4F	44	45	20
	53C0	28	36	20	44	49	47	49	54	53	29	3A	20	04	0D	0A	20
40	53D0	20	49	4E	43	4C	55	44	45	20	45	52	52	4F	52	53	20
	53E0	49	4E	20	45	43	48	4F	20	57	4F	52	44	20	31	20	28
	53F0	59	2F	4E	29	3F	20	04	0D	0A	20	20	49	4E	43	4C	55
	5400	44	45	20	45	52	52	4F	52	53	20	49	4E	20	45	43	48
45	5410	4F	20	57	4F	52	44	20	32	20	28	59	2F	4E	29	3F	20
	5420	04	0D	0A	20	20	45	4E	54	45	52	20	4E	55	4D	45	52
	5430	49	43	20	44	41	54	41	20	4D	45	53	53	41	47	45	20
	5440	28	55	50	20	54	4F	20	31	32	20	44	49	47	49	54	53
	5450	2C	20	53	50	41	43	45	53	2C	20	2D	27	53	2C	20	45
50	5460	27	53	2C	20	41	4E	44	20	2F	27	53	29	3A	20	0D	0A
	5470	20	20	20	20	20	04	0D	0A	20	20	49	53	20	4D	45	53
	5480	53	41	47	45	20	43	4F	4E	54	49	4E	55	45	44	20	49
	5490	4E	20	4E	45	58	54	20	42	4C	4F	43	4B	20	28	59	2F
55	54A0	4E	29	3F	20	04	0D	0A	20	20	4D	45	53	53	41	47	45
	54B0	20	43	4F	4E	54	49	4E	55	45	44	20	49	4E	20	4E	45
	54C0	58	54	20	42	4C	4F	43	4B	2E	04	0D	0A	20	20	45	4E
	54D0	54	45	52	20	41	4C	50	48	41	2D	4E	55	4D	45	52	49
60	54E0	43	20	44	41	52	4F	20	38	20	43	48	41	52	41	43	54
	54F0	55	50	20	52	4F	20	38	20	43	48	41	52	41	43	54	45
	5500	52	53	20	3A	20	4D	0A	20	20	20	20	20	04	0D	0A	20
	5510	20	45	54	53	05	05	1990	20	53	51	55	41	52	45	20	57
65	5520	56	45	52	54	49	4E	47	20	50	4F	4C	41				

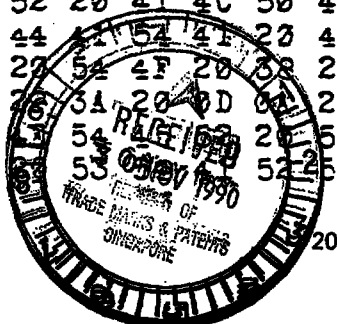


TABLE 2 (contd.)

5	5530	52	49	54	59	20	28	30	20	4F	52	20	31	29	3A	20	04
	5540	0D	0A	20	20	53	54	41	52	54	49	4E	47	20	50	4F	4C
	5550	41	52	49	54	59	20	45	4E	54	45	52	45	44	2E	04	0D
	5560	0A	20	20	53	45	4C	45	43	54	20	53	51	55	41	52	45
	5570	20	57	41	55	45	20	46	52	45	51	55	45	4E	43	59	3A
10	5580	20	0D	0A	20	20	20	31	20	2D	20	35	30	30	20	48	5A
	5590	2E	0D	0A	20	20	20	32	20	2D	20	33	30	30	20	48	5A
	55A0	2E	0D	0A	20	20	20	33	20	2D	20	31	35	30	20	48	5A
	55B0	2E	0D	0A	20	20	20	34	20	2D	20	20	37	35	20	48	5A
15	55C0	2E	0D	0A	04	0D	0A	20	20	46	52	45	51	55	45	4E	43
	55D0	59	20	45	4E	54	45	52	45	44	2E	04	0D	0A	20	45	4E
	55E0	54	45	52	20	53	51	55	41	52	45	20	57	41	56	45	20
	55F0	44	55	52	41	54	49	4F	4E	20	49	4E	20	20	53	41	4D
20	5600	50	4C	45	53	20	28	31	2D	36	35	35	33	35	29	3A	0D
	5610	0A	20	20	20	20	20	04	0D	0A	20	20	45	4E	54	45	52
	5620	20	50	52	45	41	4D	42	4C	45	20	45	43	48	4F	20	57
	5630	4F	52	44	20	28	31	20	44	49	47	49	54	29	3A	20	04
25	5640	0D	0A	20	20	50	52	45	41	4D	42	4C	45	20	57	4F	52
	5650	44	20	45	4E	54	45	52	45	44	2E	04	0D	0A	20	20	45
	5660	4E	54	45	52	20	4E	55	4D	42	45	52	20	4F	46	20	50
	5670	52	45	41	4D	42	4C	45	20	45	43	48	4F	20	57	4F	52
30	5680	44	53	20	44	45	53	49	52	45	44	0D	0A	20	20	28	31
	5690	2D	32	35	35	29	3A	20	04	0D	0A	20	20	4E	55	4D	42
	56A0	45	52	20	4F	46	20	50	52	45	41	4D	42	4C	45	20	57
	56B0	4F	52	44	53	20	45	4E	54	45	52	45	44	2E	04	0D	0A
35	56C0	20	20	49	4E	43	4C	55	44	45	20	45	52	52	4F	52	53
	56D0	20	49	4E	20	45	41	43	48	20	45	43	48	4F	20	57	4F
	56E0	52	44	20	28	59	2F	4E	29	3F	20	04	0D	0A	20	20	45
	56F0	52	52	4F	52	53	20	49	4E	43	4C	55	44	45	44	20	49
40	5700	4E	20	45	41	43	48	20	50	52	45	41	4D	42	4C	45	20
	5710	45	43	48	4F	20	57	4F	52	44	2E	24	0D	0A	0A	20	53
	5720	45	4C	45	43	54	3A	0D	0A	20	20	30	20	2D	20	43	4F
	5730	4E	54	52	4F	4C	20	4D	55	4C	54	49	50	4C	45	20	54
45	5740	52	41	4E	53	4D	49	53	53	49	4F	4E	53	2E	0D	0A	20
	5750	20	31	20	2D	20	54	52	41	4E	53	4D	49	54	20	31	20
	5760	51	55	45	55	45	2E	0D	0A	20	20	32	20	2D	20	50	52
	5770	4F	47	52	41	4D	20	51	55	45	55	45	20	42	4C	4F	43
	5780	43	53	2E	0D	0A	04	0D	0A	0A	20	45	4E	54	45	52	20
50	5790	4E	55	4D	42	45	52	20	4F	46	20	54	49	4D	45	53	20
	57A0	51	55	45	55	45	20	49	53	20	54	4F	20	42	45	20	54
	57B0	52	41	4E	53	4D	49	54	54	45	44	0D	0A	20	28	31	2D
	57C0	39	39	39	39	39	39	29	3A	20	04	0D	0A	0A	20	57	48
55	57D0	45	4E	20	52	45	41	44	59	20	54	4F	20	54	52	41	4E
	57E0	53	4D	49	54	2C	20	54	59	50	45	20	27	47	27	2E	0D
	57F0	0A	20	57	41	49	54	49	4E	47	3A	20	04	0D	0A	0A	20
	5800	54	52	41	4E	53	4D	49	53	53	49	4F	4E	20	43	4F	4D
60	5810	50	4C	45	54	45	2E	0D	0A	04	0D	0A	0A	20	20	2A	20
	5820	4D	45	4E	55	20	49	4E	43	4F	4D	50	4C	45	54	45	20
	5830	2A	0D	0A	04	D4	9C	F0	02	44	DC	38	43	04	D5	63	D5
	5840	69	D5	6F	D4	9C	F0	2B	95	DB	0D	D4	9C	F7	1B	D4	
65	5850	9C	F3	37	D4	DC	F8	4B	63	FB	27	31	B	87	32	F8	61

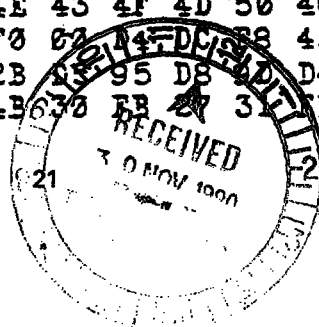


TABLE 2 (contd.)

5	5860	04	D4	9C	F0	42	D8	28	D4	DC	F8	61	01	30	39	F8	74
	5870	0D	F8	4B	04	D8	3A	D4	DC	F8	61	01	30	39	F8	83	0D
	5880	F8	83	04	D8	3A	D8	56	D8	E0	D8	F5	D0	00	D4	9C	F2
	5890	2D	D4	DC	F8	8D	59	F8	9C	4E	F8	61	04	D4	9C	F2	D0
10	58A0	D4	9C	F3	37	D4	DC	F8	9C	31	F8	B5	32	F8	BF	33	F8
	58B0	C9	34	F8	D3	04	D5	3F	F8	E1	00	00	F8	61	F8	9C	D5
	58C0	3F	F9	41	00	00	F8	61	F8	9C	D5	3F	FA	69	00	00	F8
	58D0	61	F8	9C	D5	3F	FA	05	00	00	F8	61	F8	9C	D6	23	D5
15	58E0	69	D5	3F	F8	EB	F8	E1	F9	04	F8	41	D4	9C	F3	A5	D8
	58F0	28	D5	56	D4	DC	F8	3D	01	30	39	F9	00	0D	F8	41	04
	5900	D8	3A	D5	69	D5	3F	F8	F3	F8	E1	F9	0E	F8	E1	D5	3F
	5910	F8	F3	F8	E1	F9	18	F8	E1	D5	3F	F8	F3	F8	E1	F9	22
	5920	F8	E1	D5	3F	F8	F3	F8	E1	F9	2C	F8	E1	D5	3F	F8	F3
20	5930	F8	E1	F9	36	F8	E1	D5	EC	06	02	D5	C1	D4	DC	F8	DD
	5940	04	D5	3F	F9	4B	F9	41	F9	6C	F8	41	D4	9C	F4	21	D8
	5950	28	D5	85	D4	DC	F8	3D	01	30	39	F9	00	20	F9	00	2D
	5960	F9	00	45	F9	00	2F	F9	00	0D	F8	41	04	D5	3F	F9	53
25	5970	F9	41	F9	76	F9	DA	D5	3F	F9	53	F9	41	F9	80	F9	DA
	5980	D5	3F	F9	53	F9	41	F9	8A	F9	DA	D5	3F	F9	53	F9	41
	5990	F9	04	F9	DA	D5	3F	F9	53	F9	41	F9	9E	F9	DA	D5	3F
	59A0	F9	53	F9	41	F9	A8	F9	DA	D5	3F	F9	53	F9	41	F9	B2
30	59B0	F9	FA	D5	3F	F9	53	F9	41	F9	BC	F9	DA	D5	3F	F9	53
	59C0	F9	41	F9	C6	F9	DA	D5	3F	F9	53	F9	41	F9	D0	F9	DA
	59D0	D5	3F	F9	53	F9	41	F9	DA	F9	DA	D6	50	D6	D3	D5	3F
	59E0	F9	E8	00	00	F8	3F	F9	41	D4	9C	F4	76	D4	DC	F9	E8
35	59F0	59	F9	FA	4E	F8	DD	0D	F8	41	04	D6	44	D4	9C	F4	A5
	5A00	D4	DC	F8	DD	24	D4	9C	F5	0D	D4	DC	FA	05	01	30	31
	5A10	FA	16	0D	F8	41	04	D7	13	D7	1A	D4	9C	F5	40	D4	9C
	5A20	F5	5F	D4	9C	F3	37	D4	DC	FA	1E	31	FA	3A	32	FA	42
40	5A30	33	FA	4A	34	FA	52	0D	F8	41	04	D7	09	31	D4	DC	FA
	5A40	55	04	D7	09	32	D4	DC	FA	55	04	D7	09	34	D4	DC	FA
	5A50	55	04	D7	09	38	D4	9C	F5	C4	D4	9C	F5	DB	D8	28	D5
	5A60	3F	FA	A6	FA	59	F8	DD	00	00	D8	28	D5	86	D4	9C	F6
45	5A70	17	D4	DC	FA	69	01	30	39	FA	7E	0D	F8	41	04	D7	21
	5A80	D7	28	D4	9C	F6	40	D4	9C	F6	5B	D5	3F	FA	E8	FA	86
	5A90	FA	94	FA	69	D4	9C	F6	98	D4	DC	F8	DD	04	D4	9C	F8
	5AA0	19	D4	DC	F8	43	04	D5	3F	FA	B0	F8	3D	F8	3F	00	00
	5AB0	D5	3F	FB	16	F8	3D	FA	BA	FA	E2	D5	3F	FB	16	F8	3D
50	5AC0	FA	C4	FA	E2	D5	3F	FB	16	F8	3D	FA	CE	FA	E2	D5	3F
	5AD0	FB	16	F8	3D	FA	D8	FA	E2	D5	3F	FB	16	F8	3D	FA	E2
	5AE0	FA	E2	D5	EC	05	03	D5	69	D5	3F	FA	F2	F8	3D	F8	3F
	5AF0	00	00	F5	3F	FB	16	F8	3D	FA	FC	FB	10	D5	3F	FB	16
55	5B00	F8	3D	FB	06	FB	10	D5	3F	FB	16	F8	3D	FB	10	FB	10
	5B10	D5	EC	03	05	D5	69	D4	DC	F8	3D	01	30	39	FB	23	0D
	5B20	F8	41	04	D8	3A	D5	69	D8	28	D9	35	D4	9C	F7	86	D4
	5B30	DC	FB	27	01	30	39	FB	3C	0D	F8	43	04	D8	3A	D4	DC
60	5B40	FB	27	01	30	39	FB	43	0D	FB	90	04	D8	3A	D4	DC	FB
	5B50	27	01	30	39	FB	5A	0D	FB	90	04	D8	3A	D4	DC	FB	27
	5B60	01	30	39	FB	69	0D	FB	90	04	D8	3A	D4	DC	FB	27	01
	5B70	30	39	FB	78	0D	FB	90	04	D8	3A	D4	DC	FB	27	01	30
65	5B80	39	FB	8E	0D	FB	90	04	D7	2F	D4	DC	FB	92	04	D8	3A

TABLE 2 (contd.)

5B90	D9	3E	D4	9C	F7	CA	D4	DC	FB	8E	47	FB	9E	04	D3	97
53A0	D4	9C	F7	FC	D4	DC	FB	4B	04	00	00	00	00	00	00	00
53B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
5PC0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
5PD0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
5PE0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
5PF0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Claims

1. A method of encoding information signals including a receiver address (ADR) and an activation code (AC), for transmission of information to a plural population of receivers, characterised by the steps of: generating a preamble signal indicative of a single call or a batch call, generating a single receiver address after a preamble indicative of a single call and generating a plurality of receiver addresses after a preamble indicative of a batch call, and generating an activation code after said single address or plurality of addresses.

2. A method of encoding, according to claim 1, wherein said step of generating a preamble includes the steps of:

generating one of a preamble signal and an inverted preamble signal thereby selecting said single and batch calls.

3. An encoding device for generating information signals for transmitting to a plural population of receivers, characterised by:

means (101) for generating a preamble signal for designating a single call or a batch call,

means (101) for generating a single address signal for a single call and a plurality of address signals for a batch call, the address signals selecting at least one selected receiver of said plural receiver population, and

means (101) for generating an activation code after generation of the address signals for activating said at least one selected receiver.

4. An encoding device, according to claim 3, wherein:

said means (101) for generating a preamble generates one of a preamble and an inverted preamble to select said single call or said batch call.

5. An encoding device according to claim 3, further comprising:

said means (101) including selecting means (101) for storing and selecting the information signals to be transmitted,

transmitter means (113), connected to said selecting means, for transmitting said selected information signals, and

control circuit means (101), connected to said selecting means and said transmitter means, for enabling said selecting means to generate said preamble signal, said address signal and said activation code.

6. An encoding device, according to claim 5, further comprising:

a voice receiving means (119, 117), connected to said transmitter means and said control circuit means, for receiving and storing a voice message;

said control circuit means (101) further controlling the sequence of transmission of said voice message and said information signals.

7. An encoding device, according to claim 6, wherein said control circuit means further comprises: processing means (101) for generating the information signals to be transmitted and for controlling the duration of preselected portions of said information signals and the duration of transmission of said voice message;

audio data select means (101), connected to said processing means (101), for generating an output indicating which one of said voice messages and said information signals should be transmitted;

audio data detection means (101), connected to said processing means and said transmitter means for generating an output indication that one of said voice signal and said information signal should be transmitted; and

switching means (115), connected to said processing means, said audio data select means, said voice receiving means and said transmitter means, for switching from the transmission by said transmitter means of said information signals to said voice messages and vice versa.

Patentansprüche

1. Verfahren zum Kodieren von Informationssignalen, die eine Empfängeradresse (ADR) und einen

TABLE 2 (contd.)

5390	D9	3E	D4	9C	F7	CA	D4	DC	FB	8E	47	FB	9E	04	D3	97
53A0	D4	9C	F7	FC	D4	DC	F8	4B	04	00	00	00	00	00	00	00
53B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
53C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
53D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
53E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
53F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Claims

- 15 1. A method of encoding information signals including a receiver address (ADR) and an activation code (AC), for transmission of information to a plural population of receivers, characterised by the steps of:
generating a preamble signal indicative of a single call or a batch call,
generating a single receiver address after a preamble indicative of a single call and generating a
20 plurality of receiver addresses after a preamble indicative of a batch call, and
generating an activation code after said single address or plurality of addresses.
2. A method of encoding, according to claim 1, wherein said step of generating a preamble includes the steps of:
generating one of a preamble signal and an inverted preamble signal thereby selecting said single and
25 batch calls.
3. An encoding device for generating information signals for transmitting to a plural population of receivers, characterised by:
means (101) for generating a preamble signal for designating a single call or a batch call,
means (101) for generating a single address signal for a single call and a plurality of address signals for
30 a batch call, the address signals selecting at least one selected receiver of said plural receiver population, and
means (101) for generating an activation code after generation of the address signals for activating said at least one selected receiver.
4. An encoding device, according to claim 3, wherein:
35 said means (101) for generating a preamble generates one of a preamble and an inverted preamble to select said single call or said batch call.
5. An encoding device according to claim 3, further comprising:
said means (101) including selecting means (101) for storing and selecting the information signals to be transmitted,
40 transmitter means (113), connected to said selecting means, for transmitting said selected information signals, and
control circuit means (101), connected to said selecting means and said transmitter means, for enabling said selecting means to generate said preamble signal, said address signal and said activation code.
6. An encoding device, according to claim 5, further comprising:
45 a voice receiving means (119, 117), connected to said transmitter means and said control circuit means, for receiving and storing a voice message;
said control circuit means (101) further controlling the sequence of transmission of said voice message and said information signals.
7. An encoding device, according to claim 6, wherein said control circuit means further comprises:
50 processing means (101) for generating the information signals to be transmitted and for controlling the duration of preselected portions of said information signals and the duration of transmission of said voice message;
audio data select means (101), connected to said processing means (101), for generating an output
55 indicating which one of said voice messages and said information signals should be transmitted;
audio data detection means (101), connected to said processing means and said transmitter means for generating an output indication that one of said voice signal and said information signal should be transmitted; and
switching means (115), connected to said processing means, said audio data select means, said voice
60 receiving means and said transmitter means, for switching from the transmission by said transmitter means of said information signals to said voice messages and vice versa.

Patentansprüche

- 65 1. Verfahren zum Kodieren von Informationssignalen, die eine Empfängeradresse (ADR) und einen



Aktivierungskode (AC) enthalten, zur Aussendung von Informationen an eine Vielzahl von Empfängern, gekennzeichnet durch die folgenden Schritte:

- Erzeugen eines Einleitungssignals, das für einen Einzelruf oder für einen Sammelruf kennzeichnend ist,
- Erzeugen einer einzelnen Empfängeradresse nach einer Einleitung, die für einen Einzelruf kennzeichnend ist, und Erzeugen mehrerer Empfängeradressen nach einer Einleitung, die für einen Sammelruf kennzeichnend ist, und
- Erzeugen eines Aktivierungskodes nach der Einzeladresse oder nach den mehreren Adressen.
2. Kodiervorrichtung nach Anspruch 1, bei dem die Erzeugung der Einleitung folgende Schritte umfaßt: Erzeugen eines Einleitungssignals und eines invertierten Einleitungssignals, um dadurch den Einzelruf und den Sammelruf auszuwählen.
3. Kodiervorrichtung zur Erzeugung von Informationssignalen zur Aussendung an eine Vielzahl von Empfängern, gekennzeichnet durch:
 - eine Einrichtung (101) zum Erzeugen eines Einleitungssignals für die Bestimmung eines Einzelrufs oder eines Sammelrufs,
 - eine Einrichtung (101) zur Erzeugung eines Einzeladressesignals für einen Einzelruf und mehrerer Adresssignale für einen Sammelruf, wobei die Adresssignale wenigstens einen ausgewählten Empfänger aus der Vielzahl der Empfänger auswählen, und
 - eine Einrichtung (101) zum Erzeugen eines Aktivierungskodes nach der Erzeugung der Adresssignale zur Aktivierung des genannten wenigstens einen ausgewählten Empfängers.
4. Kodiervorrichtung nach Anspruch 3, bei der die Einrichtung (101) zur Erzeugung einer Einleitung eine Einleitung oder eine invertierte Einleitung erzeugt, um den genannten Einzelruf oder den genannten Sammelruf auszuwählen.
5. Kodiervorrichtung nach Anspruch 3, weiterhin enthaltend die folgenden Merkmale:
 - die Einrichtung (101) enthält eine Wähleinrichtung (101) zum Speichern und Auswählen der auszusendenden Informationssignale,
 - eine Sendeeinrichtung (113), die mit der Wähleinrichtung verbunden ist, zur Aussendung von ausgewählten Informationssignalen, und
 - eine Steuerschaltung (101), die mit der Wähleinrichtung und der Sendeeinrichtung verbunden ist, um es der Wähleinrichtung zu ermöglichen, das Einleitungssignal, das Adresssignal und den Aktivierungskode zu erzeugen.
6. Kodiervorrichtung nach Anspruch 5, weiterhin enthaltend:
 - eine Stimmempfangseinrichtung (119, 117), die mit der Sendeeinrichtung und der Steuerschaltung verbunden ist, um eine Stimmeldung zu empfangen und zu speichern;
 - wobei die Steuerschaltung (101) weiterhin die Sendefolge der Stimmeldung und der Informationssignale steuert.
7. Kodiervorrichtung nach Anspruch 6, bei der die Steuerschaltung weiterhin enthält:
 - eine Verarbeitungseinrichtung (101) zum Erzeugen der auszusendenden Informationssignale und zum Steuern der Dauer vorgewählter Abschnitte der Informationssignale und der Dauer der Aussendung der Stimmeldung;
 - eine Audiodatenwähleinrichtung (101), die mit der Verarbeitungseinrichtung (101) verbunden ist, um einen Ausgang zu erzeugen, der anzeigt, welche der Stimmeldungen und der Informationssignale ausgesendet werden sollten;
 - eine Audiodatenermittlungseinrichtung (101), die mit der Verarbeitungseinrichtung und der Sendeeinrichtung verbunden ist, um eine Ausgangsangabe zu erzeugen, daß das Stimmsignal oder das Informationssignal ausgesendet werden sollte; und
 - eine Schaltereinrichtung (115), die mit der Verarbeitungseinrichtung, der Audiodatenwähleinrichtung, der Stimmempfangseinrichtung und der Sendeeinrichtung verbunden ist, um die durch die Sendeeinrichtung bewirkte Aussendung von den Informationssignalen auf die Stimmeldungen und umgekehrt umzuschalten.

Revendications

1. Procédé de codage de signaux d'information incluant une adresse de récepteur (ADR) et un code d'activation (AC), pour transmettre les informations à un nombre multiple de récepteurs, caractérisé en ce qu'il consiste à:
 - engendrer un signal de préambule indiquant un simple appel ou un appel groupé,
 - générer une seule adresse de récepteur après un préambule indiquant un simple appel et générer un ensemble d'adresses de récepteurs après un préambule indiquant un appel groupé, et à générer un code d'activation après l'adresse unique ou l'ensemble d'adresses.
2. Procédé de codage selon la revendication 1, dans lequel l'opération de génération d'un préambule consiste à:
 - engendrer un signal parmi un signal de préambule et un signal de préambule inversé pour sélectionner ainsi les appels simple et groupé.
3. Dispositif de codage pour engendrer des signaux d'information pour une transmission à un nombre multiple de récepteurs, caractérisé par:



un moyen (101) pour engendrer un signal de préambule afin d'indiquer un simple appel ou un appel groupé,

un moyen (101) pour générer un seul signal d'adresse pour un simple appel et un ensemble de signaux d'adresse pour un appel groupé, les signaux d'adresse sélectionnant au moins un récepteur sélectionné du nombre multiple de récepteurs, et

un moyen (101) pour générer un code d'activation après génération des signaux d'adresse afin de rendre actif au moins un récepteur sélectionné.

4. Dispositif de codage selon la revendication 3, dans lequel:

le moyen (101) pour engendrer un préambule engendre un signal parmi un préambule et un préambule inversé pour sélectionner le simple appel ou l'appel groupé.

5. Dispositif de codage selon la revendication 3, comprenant en outre:

le moyen (101) incluant le moyen de sélection (101) pour mémoriser et sélectionner les signaux d'information à transmettre,

un moyen émetteur (113), connecté au moyen de sélection, pour émettre les signaux d'information sélectionnés, et

un moyen à circuit de commande (101), connecté au moyen de sélection et au moyen émetteur, pour valider le moyen de sélection pour la génération du signal de préambule, du signal d'adresse et du code d'activation.

6. Dispositif de codage selon la revendication 5, comprenant en outre:

un moyen de réception vocale (119, 117), connecté au moyen émetteur et au moyen à circuit de commande, pour recevoir et mémoriser un message vocal;

le moyen à circuit de commande (101) contrôlant en outre la séquence de transmission du message vocal et des signaux d'information.

7. Dispositif de codage selon la revendication 6, dans lequel le moyen à circuit de commande comprend en outre:

un moyen de traitement (101) pour engendrer les signaux d'information à transmettre et pour contrôler la durée de parties sélectionnées des signaux d'information et la durée de transmission du message vocal;

un moyen de sélection audio/de données (101), connecté au moyen de traitement (101), pour engendrer un signal de sortie indiquant lesquels des messages vocaux et des signaux d'information doivent être transmis;

un moyen de détection audio/de données (101), connecté au moyen de traitement et au moyen émetteur, pour engendrer une indication de sortie qu'un signal parmi le signal vocal et le signal d'information doit être transmis; et

un moyen de commutation (115), connecté au moyen de traitement, au moyen de sélection audio/de données, au moyen de réception vocale et au moyen émetteur, pour passer de la transmission par le moyen émetteur des signaux d'information aux messages vocaux et vice versa.

