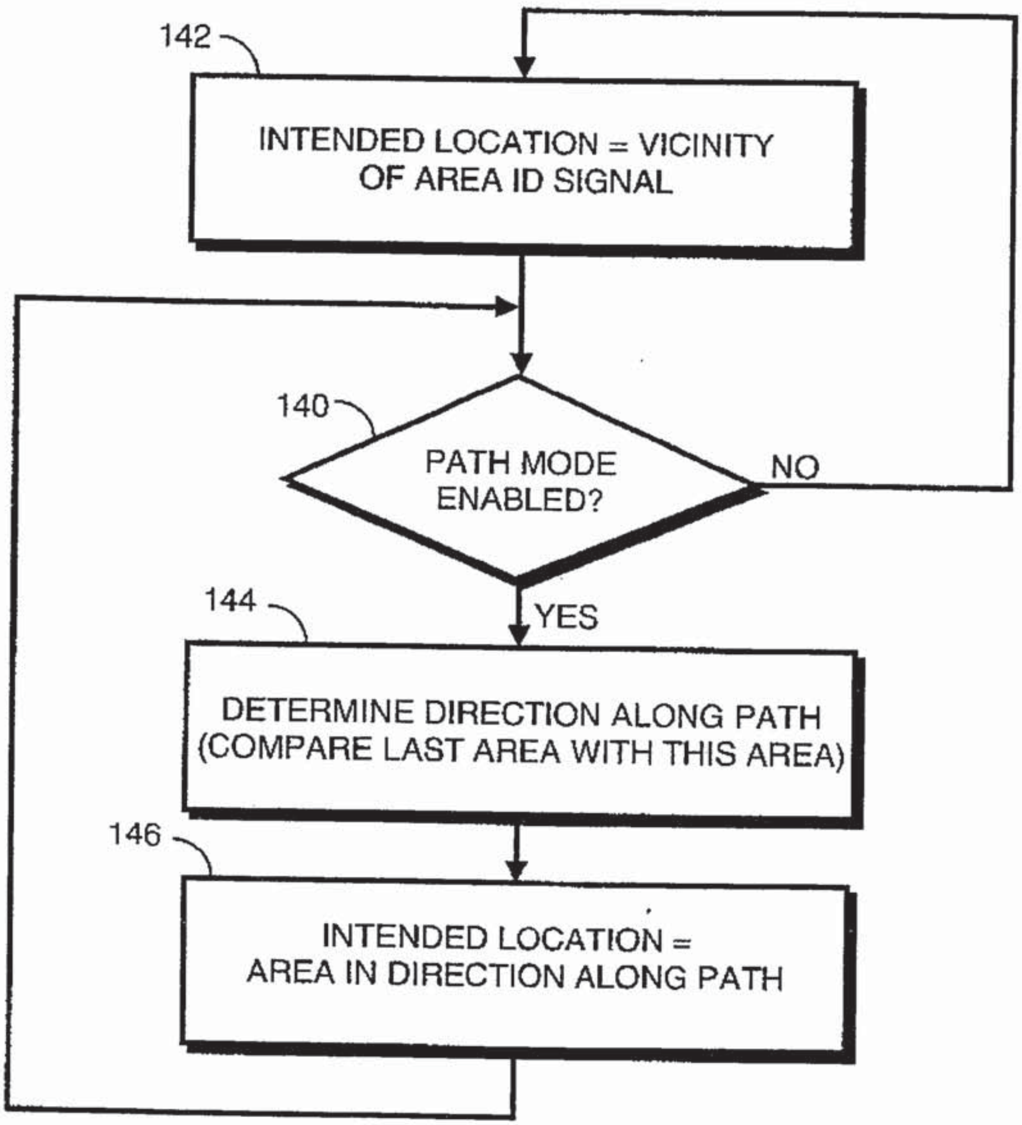

142
INTENDED LOCATION = VICINITY OF AREA ID SIGNAL
140
PATH MODE ENABLED?
NO
YES
144
DETERMINE DIRECTION ALONG PATH (COMPARE LAST AREA WITH THIS AREA)
146
INTENDED LOCATION = AREA IN DIRECTION ALONG PATH

FIG. 6

LOCATION DEPENDENT INFORMATION RECEIVING DEVICE AND METHOD

This is a continuation of application Ser. No. 08/143,966 filed Nov. 1, 1993, now abandoned.

FIELD OF THE INVENTION

This invention relates generally to the field of information receiving portable devices which use a determined location for presentation of information.

BACKGROUND OF THE INVENTION

With the advent of information services for portable receiving devices such as pagers, a user may carry an information device capable of receiving and accessing a large volume of data. Additionally, with improved memory capability of pagers, a large volume of messages may be stored in the pager. Sorting through such a large volume of messages to find information relevant to the user may pose a tedious task for the pager user.

Additionally, the recent introduction of information services provides a new method of communicating a large amount of information to a large number of people at a relatively low cost. However, information may be relevant only to a user who either has entered or is about to enter a certain location, and not relevant when the user is located elsewhere.

Thus, what is needed is a device and method for selecting relevant information from the large amount of communicated information on the basis of an intended location of the user.

SUMMARY OF THE INVENTION

A location dependent message presentation device comprises a first receiver for receiving a messaging signal transmitted by a first communication system to a multiplicity of areas. The messaging signal including a multiplicity of messages having a location signal associated therewith. The device further includes a location determining means for determining a location of the device and a control means coupled to the receiver and the location determining means for selecting a message from the multiplicity of messages, the message having a location signal corresponding to the location of the device.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a paging system having an information service which transmits a messaging signal within a coverage area divided into a multiplicity of areas by a second system in accordance with the preferred embodiment of the present invention.

FIG. 2 shows an example of a messaging signal transmitted by the paging system of the preferred embodiment of the present invention.

FIG. 3 shows a block diagram of a location dependent message display device operating in accordance with the preferred embodiment of the present invention.

FIG. 4 shows a flowchart of the device while receiving the messaging signal and the area identification signal in accordance with the preferred embodiment of the present invention.

FIG. 5 shows a flowchart for alerting messages stored in optional memory in response to a change in intended location in accordance with a second embodiment of the present invention.

FIG. 6 shows a flowchart for determining the intended location of the device in accordance with the preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 shows a paging system having information service which transmits a messaging signal within a coverage area divided into a multiplicity of areas by a second system in accordance with the preferred embodiment of the present invention. A paging system, **10**, comprises a number of transmitters for transmitting messages within a large coverage region or area **12**. A typical paging system may have a coverage area **12** which exceeds one thousand square miles or two thousand square kilometers. Also transmitting within the coverage area is a second system capable of identifying a multiplicity of areas **20**, **22**, **24**, **26** and **28** substantially smaller than the coverage area **12**. The second system may be any of a number of systems capable of indicating location in a particular area. Such systems include the global positioning system (GPS) capable of identifying a location within thirty yards or meters, portable telephone systems providing area identification signals such as the cellular telephone system or the personal communication system (PCS), or other highway location systems such as a system described in U.S. Pat. No. 5,133,081. In a preferred highway location system, each area **28** has a local base station **29** for transmitting an area identification signal within the area. FIG. **1** also shows an intersection of two streets, Northsouth street **32** and Eastwest street **34**. At the intersection of the two streets is a location of interest **36**. The location may correspond to a retail outlet, service center or residence of the user of the device.

FIG. **2** shows an example of a messaging signal transmitted by the paging system of the preferred embodiment of the present invention. A first message signal consists of a typical selective call message having an address **40** followed by first message information **42**. A second message signal consists of a location signal **44** followed by second message information **46**. A third message signal consists of an address **48** followed by a location signal **50** and third message information **52**. Note that the third message may have the location signal **50** and address **48** occur in reverse order. Furthermore, the address, **40** and **48**, may consist of more than one portion, there by allowing sub-addressing of paging receivers in a manner known to those familiar with the art. Also, the location signals **44** and **50** may indicate a plurality of locations in which the message is to be received. In the preferred embodiment, the messaging signal is carried upon the POCSAG protocol, a well known paging protocol which provides for Doth selective call messaging and information service messaging. Alternately, different paging protocols may be used, one such paging protocol providing for improved information services is the Motorola Flex™ paging protocol.

FIG. **3** shows a block diagram of a location dependent message display device **55** operating in accordance with the preferred embodiment of the present invention. The messaging signal of FIG. **2** is received at the device by an antenna **60**, demodulated by receiver **62**, and an address decoder **64** searches each message for a predetermined address 66 assigned to the receiver. Device 55 also has a second antenna 70, which may be common to antenna 60, for receiving an area identification signal transmitted by the second system. Antenna 70 is coupled to location receiver 72 which demodulates and processes the area identification signal. Receivers 72 and 62 may share elements and need not be independent of each other. Controller 75 receives the messaging signal and the results determined by the address decoder 64 as well as the area identification signals from the location receiver 72. The message signals may be stored in optional memory 80 for later retrieval. Upon reception of a message an alert may be generated on alert generator 82 which is preferably a combination of an audio speaker, a lamp and an icon on display 84 which can operate in any of a number alert modes known for use with paging receivers. Then, the message may be annunciated on a message annunciator, which is preferably a display 84 for displaying displayable message information. In alternate embodiments, the annunciating means may be a speaker for annunciating audible message information. User entry means 86 preferably consists of a plurality of buttons for controlling the operation of the device 55. Such operational control includes operating display 84, resetting an alert generated on alert means 82, inhibiting detection of a location detection mode and entry of a path upon which the user may travel.

FIG. 4 shows a flowchart of the device while receiving the messaging signal and the area identification signal in accordance with the preferred embodiment of the present invention. In step 100, the messaging signal is received by paging receiver 62, and the area identification signal is received by location receiver 72, then an intended location is derived from the area identification signal. Steps for deriving the intended location from the received area identification signal are described by FIG. 6. In step 102, each message is examined for the presence of a location signal such as location signals 44 and 50 of FIG. 2. If a location signal is present, then step 104 examines the received message for the presence of an address signal, such as addresses signals 40 and 48 of FIG. 2. If an address signal is present, then address decoder 64 determines if the address signal matches the predetermined device address 66. If there is no match, step 100 is returned to. However, if there is either a matching address or if there is location signal, then in step 108, the remainder of the message signal is received and the message signal is optionally stored in optional memory 80. After reception of the message, the location signal of the message (if any) is examined to determine if it matches the intended location at step 110. If there is a match, or if there is no location signal (but the address signal matches the address of the device from step 100), then the reception of the message is alerted and the message is displayed in step 112. If the location signal of the message is different from the intended location at step 110, then step 114 checks if the location mode is inhibited and the device's address is present. If true, step 114 causes the message to be alerted and displayed in step 112, otherwise, the message is ignored and step 100 is returned to.

FIG. 4 shows that messages of the messaging signal will be alerted and displayed if the location signal of the message matches the intended location of the device. This corresponds to the second message signal 44 and 46 of FIG. 2. This provides the user with the advantage of eliminating the need to sort through the reception of all of the location dependent messages transmitted by the paging system which may or may not be relevant to the user. Only messages relevant to the intended location of the user are alerted or displayed to the user. For example, if location of interest 36 was a one of a chain of retail department stores, and the user of the device was in the vicinity of the store 36, then device 55 could determine its proximity to the store 36 by receiving the area identification signal transmitted in area 20 and determining its intended area to include the location signal indicating store 36. The information portion of the message could contain advertising information relevant to the store. The device user would be alerted to the information while in the vicinity of the store 36 thereby making the purchase of the items convenient. Furthermore, with the advent of high speed paging protocols such as Motorola's Flex™ protocol providing for low cost communication of large amounts of information over a large area, the department store may avail itself of low cost advertising limited to potential customers in the vicinity of a store. Also, since the location signal may indicate several locations for reception of the message, if the store is a member of a chain of stores within the coverage area 12, all having identical advertising, the location signal 44 may indicate each store's location, and the information 46 may be received by devices located in the vicinity of each of the stores by a single transmission of the advertisement by the paging system. Thus, the invention also provides an advantageous form of message communication for the message sender.

FIG. 4 also shows that a message signal may only be alerted and displayed if both the intended location of the device matches the location signal and the address of the device matches the predetermined address of the device. This corresponds to the third message signal of FIG. 2 having an address signal 48, a location signal 50 as well as message information 52. This aspect realizes the advantage of further reducing the amount of sorting of information services messages of the message system by the user. For example, the address could be associated with a particular purchasing habit of the user. If the user owned a German manufactured automobile and regularly purchases automobile services, the address could be indicative of group of German automobiles owners, and store 36 could correspond to a company which services German automobiles. In this example, only users the vicinity of the German car repair store would receive advertising information regarding special service rates for German cars. This reduces the amount of information which the user sorts through in order to find information relevant to the user, because the information is specific to the user and related to the vicinity in which the user intends to be.

FIG. 4 also shows that in step 114, the vicinity restriction may be inhibited and all messages having the user's device address will be alerted and displayed. This allows all messages directed to the user to be received by the user independent of the location signal and thus the location of the user. Further, FIG. 4 also provides for operation of the device as a normal selective call receiver for receiving an individual message such as the first message 40 and 42 of FIG. 2.

From a second perspective, the location signals 44 and 50 of FIG. 2 may be considered as another form of a paging address or sub-address. From this perspective, the signals of the second system 20–28 operate to change the address of the pager 55. Thus, the pager 55 receives an area identification signal from a second radio frequency communication system, determines an address signal in response to the signal, receives either a single address portion 44, or a combination of addresses or address and a sub-address as shown by 48 combined with 50. Pager 55 then indicates the reception of the message if the address portion matches the address signal. Furthermore, the paging system 10 has a new way of communicating messages within a large area **12** for reception in individual smaller areas, such as predetermined area **20**. In this case, the communication system determines at least one predetermined location for reception of the information portion, the location may be indicated by the sender to be predetermined area **20** near point of interest **36**. The paging system then assigns a signal indicative of the predetermined location and transmits the message signal in area **12** which is substantially larger than the predetermined location **20**.

FIG. **5** shows a flowchart for alerting messages stored in optional memory **80** in response to a change in intended location in accordance with a second embodiment of the present invention. The operation of FIG. **5** is an optional operation because substantially more memory may be required than is currently marketable in a conventional paging device, but anticipates its future practicality. Step **120** determines if a new intended location has been determined. Determination of intended location is described by FIG. **6**. If the intended location remains unchanged, then step **122** determines if the location mode has been inhibited. If not inhibited, step **120** is returned to. If either a new intended location has been determined or the location mode inhibited, the memory **80** is examined for unalerted messages, that is messages that were received and stored in step **108** yet not alerted by step **112**. In alternate embodiments, the unalerted requirement of step **124** may be modified or eliminated. Then, step **126** determines which unalerted messages have a location signal matching the intended location or, if the location mode is inhibited, step **128** determines which unalerted messages have an address signal matching the device address. If the result of either step **126** or **128** is true, then each identified message is alerted and displayed in step **130**. Otherwise, step **130** is skipped and step **120** is returned to.

FIG. **5** shows alerting and displaying a message previously received by the device and stored in memory in response to the device having a new intended location. This aspect of the invention has the advantage of allowing for transmission of a message signal when the user in not in a desired vicinity and alerting and display of the message when the user enters the desired vicinity. For example, a user may pass through the vicinity of store **36** in a short time, two minutes for example. By first receiving and storing the message before the user enters the vicinity of the store and then alerting it when the user is in the vicinity, the message need not be transmitted during the two minutes while the user is physically in the vicinity of store **36**. This aspect has the advantage of allowing the message signal to be transmitted at any time prior to the user's entry to the vicinity of the store. This allows the message to be transmitted during times when the paging system is lightly loaded, at night time for example, and should further reduce the cost of the transmission of the message signal. Furthermore, the user is assured that the information will be alerted while the user is in the vicinity of the store, even though the message signal was not transmitted then.

FIG. **5** also allows for inhibiting the location signal and detection, alerting and displaying messages having an address matching the device address independent of the location signal. As previously discussed, this allows the user to examine all messages directed at the user with different location signals.

FIG. **6** shows a flowchart for determining the intended location of the device in accordance with the preferred embodiment of the present invention. Beginning at step **140**, if the path mode is not enabled, step **142** sets the intended location to the vicinity of the area identification signal received by location receiver **72**. This may be accomplished in a variety of ways. If the second location system is a global positioning system (GPS), then the latitude and longitude of the device can be ascertained from the GPS area identification signal and the intended location be a predetermined vicinity, such as any location within a quarter mile or a third of a kilometer of the device. In which case the location signals **44** and **50** could also contain latitude and longitude coordinates for analysis by controller **75**. If the cellular or PCS telephone or the highway location system were used, then the intended location could correspond to cell in which the area identification signal was received, or expanded to include a predetermined number of cells in the surrounding vicinity. In this case, the location signal of FIG. **2** could correspond to an address signal identifying a cell of the system.

If the path mode is enabled, step **140** proceeds to step **144** to determine the direction along the path. The path mode may be enabled or disabled by a user selection via switches **86**. As an example, if the user's normal path from employment at a location within area **24** along Eastwest street **34** to a residence located in area **26** off of Northsouth street **32**, then the intended path begins at area **24** and goes along Eastwest street **34** through areas **22** and **20**, to the intersection of Eastwest street **34** and Northsouth street **32**, and along Northsouth street to the residence in area **26**. The user may enter the above described path into the device using user entry switches **86**, or by down-loading data from a personal computer to the device through a data interface (not shown) to the controller. Step **144** determines the direction along the path by determining a change from area **24** to area **22**. Alternately, if the path mode was entered with the device at a path's end point, such as area **24**, then the direction may be automatically determined to be in the only possible direction along the path, areas **24**, **22**, **20** then **26**. After determining the direction, then step **146** determines the intended location to be the area in the determined direction along the path. In the above example, the direction was determined in area **22** and the direction of the path would include areas **22**, **20**, and **26**, thus the intended location would correspond to areas **22**, **20** and **26**. If the path were long, the intended location can be limited to number of areas along the path which the user is expected to encounter within a predetermined amount of time or distance. For example, the intended area could be limited to areas **22** and **20** while the device in located in area **22**. Since location of interest **36** is within the area of interest, the message corresponding to location **36** would be alerted and displayed as described with respect to FIGS. **4** and **5** before the device and its user are in the vicinity of location of interest **36**. This aspect of the invention allows the user to plan a response to the message signal regarding the area of interest **36** before arrival in its vicinity.

Furthermore, area **24**, while on the path is not a member of the intended location because it does not lie along the direction of the path from area **22** to area **26**. This has the advantage of sparing the user from sorting through messages intended for a location in area **24**, or locations which the user has already passed. An advantageous example of information for use in path mode is traffic conditions. This mode allows the user to be alerted to unusual traffic conditions along the predetermined path in advance of arrival of the traffic condition. If the message signal indicated the occurrence of a traffic accident blocking the intersection of Eastwest street and Northsouth street, then the user could plan an alternate route of travel in advance of encountering the accident. Other traffic information, even though transmitted by the paging system **10** and received and stored by the device **55**, would not be presented to the user because the device **55** is able to sort through and determine the relevancy of the information based upon the location or intended location of the user. Alternately, the intended location could correspond to both directions along the path, and may further be limited only to areas which the device may determine the user is likely to enter within a predetermined time or distance.

Thus, what is provided is a device and method for selecting from the large amount of information on the basis of an intended location of the user.

What is claimed is:

1. A location dependent message presentation device comprising:

a first receiver for receiving a messaging signal transmitted by a first communication system to a coverage region comprised of a multiplicity of substantially smaller areas, the messaging signal including a multiplicity of messages having a location signal associated therewith;

a location determining means for determining independently of the messaging signal a location of the device, said location determining means including a second receiver for receiving an area identification signal transmitted by a second communication system for transmitting area identification signals indicative of each of the multiplicity of areas; and

a control means coupled to said first receiver and said location determining means for selecting a message of the multiplicity of messages having a location signal corresponding to the location of the device.

2. The device according to claim **1** wherein the second communication system corresponds to a personal communication system.

3. The device according to claim **1** wherein the second communication system corresponds to a global positioning system.

4. The device according to claim **1** wherein each location signal corresponds to at least one of the areas.

5. The device according to claim **1** wherein the multiplicity of messages further includes a plurality of messages, each of the plurality of messages an having an address signal indicative of at least one selective call receiver, and the device comprises a selective call receiving device having a predetermined address, and the device further comprises:

an address decoding means for identifying the message from the plurality of messages if the message has an address signal matching the predetermined address; and wherein

said control means is further coupled to said address decoding means for selecting the message in response to both the location of the device signal corresponding to the intended location of the device and the address signal corresponding to the predetermined address.

6. The device according to claim **5** further comprising:

a manual input means for inhibiting operation of said location determining means; and wherein

said control means selects the message in response to the address signal matching the predetermined address of the device and not the location signal corresponding to the intended location.

7. The device according to claim **1** wherein said control means determines a path of movement of the device and the location of the device corresponds to a plurality of locations along the path of movement of the device.

8. The device according to claim **1** further comprising:

a manual input means for allowing a user to input the path of movement of the device, and wherein

said location determination means determines the location of the device to be substantially equal to a plurality of locations along the path of movement of the device in which the device anticipates to be located.

9. The device according to claim **1** further comprising:

a memory means coupled to said first receiver for storing the multiplicity of messages, and wherein

said control means, being further coupled to said memory means, selects the message from said memory means.

10. The device according to claim **1** further comprising an alerting means coupled to said control means for generating an alert in response to said control means selecting the message.

11. The device according to claim **1** further comprising an annunciating means coupled to said control means for annunciating the message.

12. The device according to claim **11** wherein the message includes displayable information, and said annunciating means includes a display for displaying the displayable information.

13. The device according to claim **11** wherein the message includes audible information, and said annunciating means includes a speaker for converting the audible information into sound.

14. A location dependent message presentation method comprising the steps of:

(a) receiving a messaging signal transmitted by a first communication system to a coverage region comprised of a multiplicity of substantially smaller areas, the messaging signal including a multiplicity of messages having a location signal associated therewith;

(b) determining independently of the messaging signal a location of the device including receiving an area identification signal transmitted by a second communication system for transmitting area identification signals indicative of each of the multiplicity of areas; and

(c) selecting a message of the multiplicity of messages having a location signal corresponding to the location of the device.

15. The method according to claim **14** further comprising the steps of:

(d) storing the multiplicity of messages in a memory; and

(e) selecting a message from the memory.

16. The method according to claim **14** wherein the multiplicity of messages include a plurality of messages, each of the plurality of messages having an address signal associated therewith, and the method further comprises the step of:

(f) identifying the message from the plurality of messages if the message has an address signal matching a predetermined address; and wherein

said step (c) of selecting further includes the step of selecting the message in response to both the location signal corresponding to the intended location and in response to said step (g) of identifying.

17. A location dependent message presentation device comprising:

a first receiver for receiving a messaging signal transmitted by a first communication system to a multiplicity of areas, the messaging signal including a multiplicity of messages having a location signal and an address signal associated therewith;

a location determining means for determining independently of the messaging signal a location of the device, said location determining means having a second receiver for receiving an area identification signal transmitted by a second communication system for transmitting a multiplicity of area identification signals within the multiplicity of areas, each of the multiplicity of area identification signals being indicative of a predetermined one of the areas wherein the location corresponds to one of the area identification signals;

a memory means for storing the multiplicity of messages;

an address decoder for identifying a message from the multiplicity of messages if the address signal of the message matches a predetermined address;

a control means coupled to said first receiver, said address decoder, and said location determining means for selecting the message if the location signal of the message corresponds to the location of the device and the address signal of the message corresponds to the predetermined address;

an alerting means coupled to said control means for generating an alert in response to said control means selecting the message; and

an annunciating means coupled to said control means for annunciating the message.

18. In a selective call receiver, a method of selectively receiving a message transmitted within a first area by a first radio frequency communication system, the message having an address portion indicative of a predetermined area within the first area, the method comprising the steps of:

(a) receiving a signal from a second radio frequency communication system, the signal indicative of a second area within the first area;

(b) determining an address signal in response to the signal, the address signal being indicative of a location of the device;

(c) receiving the address portion; and

(d) producing a reception signal indicative of a reception of the message if the address portion matches the address signal and the predetermined location is within the intended area.

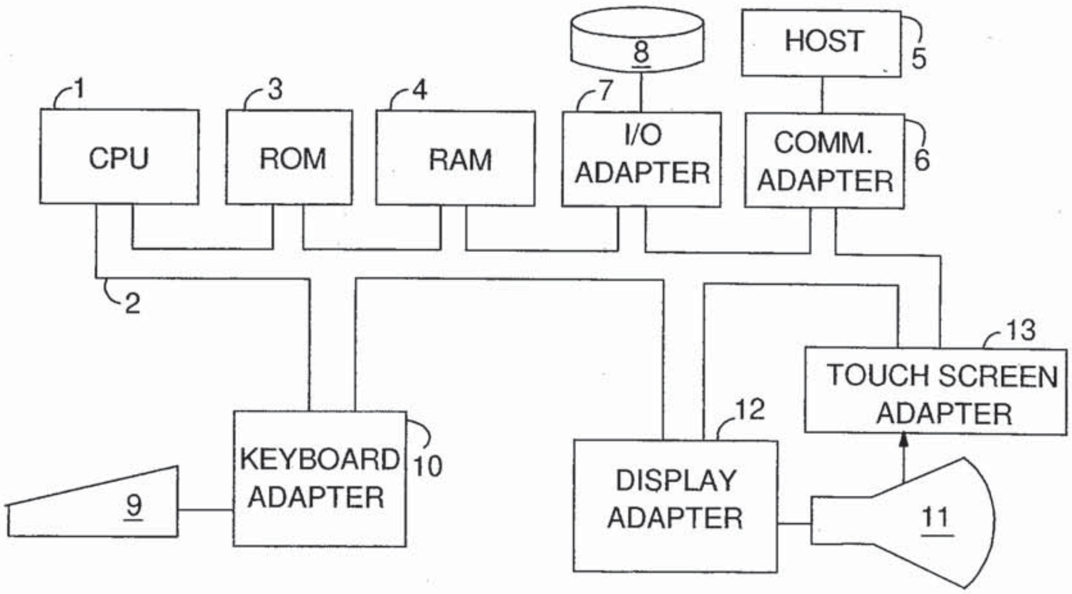
19. A selective call receiver for receiving messages within a coverage area, comprising:

a first receiver for receiving an area identification signal transmitted by a system for transmitting one of a multiplicity of area identification signals to each of a multiplicity of areas within the coverage region, each of the areas being relatively smaller than the coverage region;

a second receiver for receiving a messaging signal transmitted to the coverage region, the messaging signal carrying a multiplicity of messages, a location portion of at least one of the multiplicity of messages containing information associated with at least one of the multiplicity of areas; and

means coupled to the first receiver and to the second receiver for displaying at least one of the messages carried by the messaging signal in response to the location portion of the at least one of the messages and in response a received area identification signal.

* * * * *


8
HOST
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3
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ROM
RAM
I/O
ADAPTER
COMM.
ADAPTER
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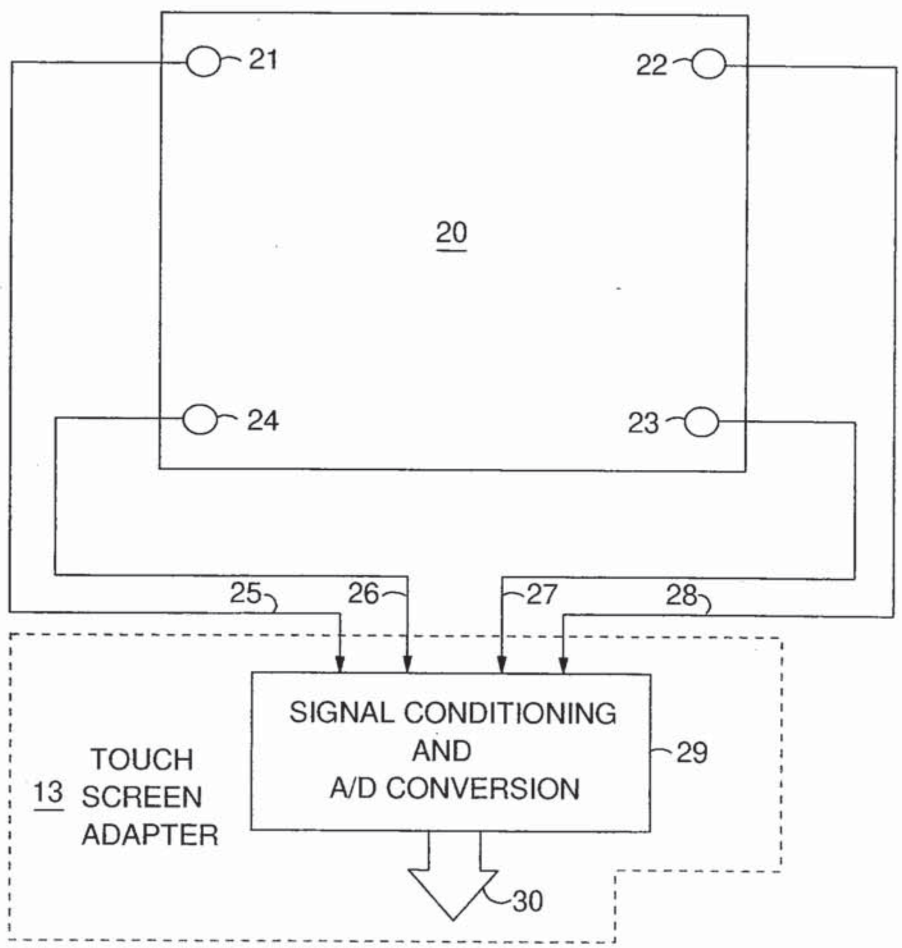
TOUCH SCREEN
ADAPTER
12
KEYBOARD
ADAPTER
10
9
DISPLAY
ADAPTER
11

FIG. 1


21
22
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24
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27
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SIGNAL CONDITIONING
AND
A/D CONVERSION
29
TOUCH
13 SCREEN
ADAPTER
30

FIG. 2

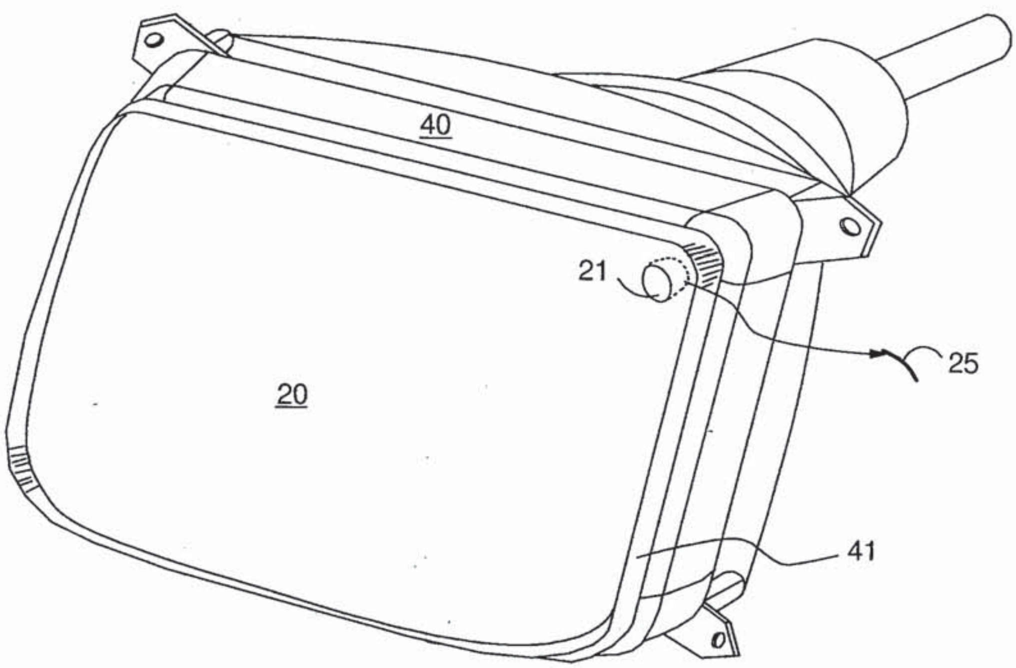

FIG. 3

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR		ATTORNEY DOCKET NO.
[illegible]	[illegible]/97	LOUIS BRIANCON	A	PF01297NA

LM32/0508

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ART UNIT	PAPER NUMBER
2735	

DATE MAILED: 05/08/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

PTO-90C (Rev. 2/95)
*U.S. GPO: 1997-422-196/60031

1- File Copy

Office Action Summary	Application No. 08/822,024	Applicant(s) Alain Charles
	Examiner Jean Jeanglaude	Group Art Unit 2735

☒ Responsive to communication(s) filed on *Mar 24, 1997*.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-21* is/are pending in the application.

Of the above, claim(s) ____ is/are withdrawn from consideration.

☐ Claim(s) ____ is/are allowed.

☒ Claim(s) *1-3, 6-8, 10-18, 20, and 21* is/are rejected.

☒ Claim(s) *4, 5, 9, and 19* is/are objected to.

☐ Claims ____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on ____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on ____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) ____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: ____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). *3*

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

1. This is a first office action in response to application number 08/822024 (attorney's docket number PF01297NA) on March 24, 1997 in which claims 1 - 21 are presented for examination.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 - 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeLuca (US Patent Number 5,254,986) in view of DeLuca et al. (US Patent Number 5,225,826) .

4. Regarding claims 1 - 3, DeLuca (5,254,986) teaches the method of processing spatially sensitive information at a selective call receiver (col 4 lines 23, 24) that comprises the steps of receiving the spatially sensitive information along with an associated identifier (col 2 lines 12 - 16; col 3 lines 24 - 32), detecting a change in the associated identifier as the selective call receiver roams from a first to a second area (col 3 lines 22 - 32); a valid

local area is detected (fig 5). DeLuca (5,254,986) is silent on teaching a messaging system that comprises a method that stores the spatially sensitive information if the associated identifier is valid (claim 1), a method wherein the method comprises the step of deleting at least portions of the spatially sensitive information (claim 2), a method wherein the method comprises the step of displaying portions of the spatially sensitive information (claim 3).

5. However, DeLuca et al. (5,225,826), in the same field of endeavor, teach a selective call receiver that comprises a method that comprises the steps of storing the spatially sensitive message (message information) (col 5 lines 48 - 53), deleting at least portions of the spatially sensitive information (stored messages) (col 3 lines 55 - 60), at least displaying portions of the spatially sensitive information (message information) (col 3 lines 43 - 46),

6. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a method that stores the spatially sensitive information if the associated identifier is valid, a method wherein the method comprises the step of deleting at least portions of the spatially sensitive information, a method wherein the method comprises the step of displaying portions of the spatially sensitive information in DeLuca (5,254,986) as evidenced by DeLuca et al. (5,225,826) because

DeLuca (5,254,986) teaches a communication system (messaging device) for the purpose of enabling local mode paging in a nation wide paging network and DeLuca et al. (5,225,826) teach a communication system (messaging device) including the aforementioned limitations for the purpose of determining the response of the receiver to a message in accordance with a status associated with that message.

7. Claims 6, 8, 10 - 15, 17, 18, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeLuca et al (US Patent Number 5,225,826) in view of DeLuca (US Patent Number 5,254,986).

8. Regarding claim 6, DeLuca et al (5,225,826) teach the method of processing a message among a plurality of messages received over the air at a selective call receiver (col 3 lines 27 - 60) that comprises the steps of receiving the plurality of messages (messages 1 - N, fig 1), at least a portion of the messages being received with a message status (address) that includes space/time indicator (fig 7), tagging the messages for processing when the space/time indicator changes (figs 2 , 3, 10) ; processing the messages that were tagged (col 3 lines 35 - 60), storing messages (col 5 lines 48 - 53).

9. Regarding claim 8, DeLuca et al (5,225,826) teach the method wherein the step of tagging further comprises the step of tagging the messages when the space/time indicator indicates a change in time beyond a threshold period (figs 2, 3, 10).

10. Regarding claim 10, DeLuca et al (5,225,826) teach the method wherein the step of processing further comprises the step of displaying at least portions of the messages that were tagged (col 3 lines 43 - 46).

11. Regarding claim 11, DeLuca et al. (5,225,826) teach a messaging device (fig 1) for receiving a plurality of messages (messages 1 - N, fig 1), the messaging device comprises a selective call receiver for receiving the plurality of messages (messages 1 - N, fig 1), a memory (34, fig 1) for storing at least a portion of the plurality of messages (messages 1 - N, fig 1), a processor (24, fig 1) for processing the portion of the plurality of messages (col 3 lines 35, 36).

12. Regarding claim 14, the messaging device of DeLuca et al. (5,225,826) comprises a real time clock (38, fig 1).

13. Regarding claim 17, DeLuca et al. (5,225,826) teach a messaging device (fig 1) for receiving a plurality of messages (messages 1 - N, fig 1); a selective call receiver for receiving the plurality of messages (messages 1 - N, fig 1).

14. Regarding claim 18, DeLuca et al. (5,225,826) teach the messaging device wherein the messaging device is a one-way selective call receiver and the processor stores a message and enable the display of the message (col 3 lines 44 - 60).

15. Regarding claim 20, DeLuca et al. (5,225,826) teach a messaging device wherein the messaging device is a one-way selective call (receiving plurality of messages) (col 2 lines 18 - 21) and the processor (24, fig 1) deletes an existing message from the second memory if a match is found between the existing messages (location identifiers) and the address (location identifier) associated with the message (col 3 lines 55 - 60; col 9 lines 51 - 54; paragraph bridging col 8 and 9) (the processor deletes an existing message in the memory if there is a match found in the memory; the existing message has a unique address that corresponds to the incoming message).

16. DeLuca et al. (5,225,826) is silent on teaching a method that stored the messages if the relevancy status matches a stored relevancy status at the selective call receiver (claim 6), a messaging device for receiving at least a portion of the plurality of messages

for having a relevancy status (location identifier) for the portion of the plurality of messages and updates to the relevancy status, a memory for storing the updates to the relevancy status (claim 11). Moreover, DeLuca et al. (5,225,826) is silent on teaching a messaging device wherein the relevancy status is a location identifier (claim 12) and a messaging device for receiving at least a portion of the plurality of messages for receiving the location identifier for the portion of the plurality of messages and updates to the location identifier, a first memory for storing a list of existing location identifiers, a second memory location for storing the location identifier for the portion of the plurality of messages and the updates to the location identifiers, a processor for processing the portion of the plurality of messages that have a location identifier by comparing the first memory location with the second memory location (claim 17).

17. However, DeLuca (5,254,986) teaches, in the same field of endeavor, a messaging device for receiving at least a portion of the plurality of messages (messages A - N, fig 3) having a relevancy status (location identifier) (301, fig 3). The selective call receiver of DeLuca (5,254,986) also receives the relevancy status (location identifier) for the portion of the plurality of messages (fig 3, paragraph bridging col 3 and 4) and updates to the relevancy status (location identifier) (col 4 lines 37 - 41); a memory (407, fig 4) for storing the updates to the relevancy status (location identifier) (col 4 lines 37 - 41); a processor

(404, fig 4) for processing the portion of the plurality of messages that have received updates to the relevancy status.

18. The selective call receiver of DeLuca (5,254,986) also receives the location identifier (relevancy status) for the portion of the plurality of messages (fig 3, paragraph bridging col 3 and 4) and updates to the location identifier (relevancy status) (col 4 lines 37 - 41); a memory (407, fig 4) for storing a list of location identifiers and the location identifier for the portion of the plurality of messages (messages A - N) (see fig 4) and the updates to the location identifiers (col 4 lines 37 - 41), a processor (404, fig 4) for processing the portion of the plurality of messages that have a location identifier by comparing the first memory location with the second memory location [fig 3 has a list of location identifiers (301) and addressing field (302) and message fields (303) that are stored in the memory of the receivers, on upon receipt of the signals the receiver compares the received signals with the location identifiers, addressing and message fields that were stored in the memory of the receiver)]; if a valid local area identifier is detected the pager selects the appropriate local parameters (fig 5; col 5 lines 49 - 51) [the receiver of DeLuca (5,254,986) changes location from Miami to Chicago or New York].

19. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a messaging device that comprises a method that stored

the messages if the relevancy status matches a stored relevancy status at the selective call receiver, a messaging device for receiving at least a portion of the plurality of messages for having a relevancy status (location identifier) for the portion of the plurality of messages and updates to the relevancy status, a memory for storing the updates to the relevancy status, a messaging device for receiving at least a portion of the plurality of messages for receiving the location identifier for the portion of the plurality of messages and updates to the location identifier, a first memory for storing a list of existing location identifiers, a second memory location for storing the location identifier for the portion of the plurality of messages and the updates to the location identifiers, a processor for processing the portion of the plurality of messages that have a location identifier by comparing the first memory location with the second memory location in DeLuca et al. (5,225,826) as evidenced by DeLuca (5,254,986) because DeLuca et al. (5,225,826) teach a communication system (messaging device) for the purpose of determining the response of the receiver to a message in accordance with a status associated with that message and DeLuca (5,254,986) teaches a communication system (messaging device) including the aforementioned limitations for the purpose of enabling local mode paging in a nation wide paging network.

20. Regarding claims 13 and 15, the communication system (messaging device) of DeLuca (5,254,986) receives an address that includes the relevancy status (location identifier) (301; fig 3) [the messages received by the receiver comprises an address field (302; fig 3) that includes the location identifier (301; fig 3)]. DeLuca et al. (5,225,826), DeLuca (5,254,986) teach all the limitations of claims 13 and 15 but fail to specifically teach a messaging device wherein the location identifier is selected from the group consisting of Simulcast System Identifier (SSID), Network Identifier (NID), Service Provider Identifier (SPID), Zone Identifier, Subzone Identifier, market indicator, information identifier, transmitter color code and a prohibited location identifier (claim 13) and a messaging device wherein the relevancy status is selected from the group consisting of Simulcast System Identifier (SSID), Network Identifier (NID), Service Provider Identifier (SPID), Zone Identifier, Subzone Identifier, market indicator, information identifier, transmitter color code and a prohibited location identifier and timeout indicator (claim 15).

21. Such limitations would have been an obvious matter of choice of design to include a messaging device wherein the location identifier is selected from the group consisting of Simulcast System Identifier (SSID), Network Identifier (NID), Service Provider Identifier (SPID), Zone Identifier, Subzone Identifier, market indicator, information identifier, transmitter color code and a prohibited location identifier and a messaging device wherein the relevancy status is selected from the group consisting of Simulcast System Identifier

(SSID), Network Identifier (NID), Service Provider Identifier (SPID), Zone Identifier, Subzone Identifier, market indicator, information identifier, transmitter color code and a prohibited location identifier and timeout indicator in DeLuca et al. (5,225,826), DeLuca (5,254,986) and Willard et al's system since the Applicant has not disclosed that such a limitation solves any stated problem or critical for any particular purpose and it appears that the invention would perform equally well with or without such selections.

22. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeLuca et al (US Patent Number 5,225,826) in view of DeLuca (5,254,986) as applied to claim 6.

23. DeLuca et al (US Patent Number 5,225,826) teach all the limitations of claim 7 but fail to specifically teach a method wherein the step of tagging the messages when the space/time indicator indicates a change in location.

24. However, DeLuca (5,254,986) teaches a messaging device that comprises a method wherein the step of tagging comprises tagging the messages when the space/time indicator indicates a change in location (col 3 lines 3 - 21) [the receiver of DeLuca (5,254,986) changes location from Miami to Chicago or New York].

25. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a messaging device that comprises a method wherein the step of tagging the messages when the space/time indicator indicates a change in location in DeLuca et al (US Patent Number 5,225,826) 's communication system as evidenced by DeLuca (5,254,986) because DeLuca et al. (5,225,826) teach a communication system (messaging device) for the purpose of determining the response of the receiver to a message in accordance with a status associated with that message and DeLuca (5,254,986) teaches a communication system (messaging device) including the aforementioned limitations for the purpose of enabling local mode paging in a nation wide paging network.

26. Claims 16 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeLuca et al (US Patent Number 5,225,826) in view of DeLuca (US Patent Number 5,254,986) as applied to claims 11 and 17 above, and further in view of Willard et al (US Patent Number 5,600,312).

27. Both DeLuca et al. (5,225,826) and DeLuca (5,254,986) teach all the limitations of claims 16 and 21 but fail to specifically teach a messaging device that comprises a transmitter.

28. However, Willard et al, in the same field of endeavor, teach a messaging system that comprises a transmitter (508, fig 18) for transmitting group of messages throughout a network.

29. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a transmitter in both DeLuca et al. (5,225,826) and DeLuca (5,254,986) paging system as applied to claims 11 and 17 as evidenced by Willard et al because DeLuca et al. (5,225,826) teach a communication system (messaging device) for the purpose of determining the response of the receiver to a message in accordance with a status associated with that message and DeLuca (5,254,986) teaches a communication system (messaging device) for the purpose of enabling local mode paging in a nation wide paging network and Willard et al teach a messaging system including the above limitations for the purpose of transmitting group messages throughout a network.

Allowable Subject Matter

30. Claims 4, 5 , 9, 19 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

31. The following is a statement of reasons for the indication of allowable subject matter: the prior art made of record fails to suggest the method wherein the method further comprises the step of deleting at least portions of the spatially sensitive information when the user prompts the selective call receiver to display at least portions of the spatially sensitive information.

32. The prior art made of record fails to suggest the method wherein the step of processing further comprises the step of deleting messages that have an invalid space/time indicator.

33. The prior art made of record fails to suggest the messaging device wherein the messaging device is a one way selective call receiver and the processor does not store a message if a match is found between the existing location identifiers and the location identifier associated with the message.

Contact Information

34. An inquiry concerning this communication or earlier communications from the examiner should be directed to Jean Jeanglaude whose telephone number is (703) 305-2701. The examiner can normally be reached on Monday through Friday from 8:00 A.M. to 4:00 P.M..

35. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Michael Horabik, can be reached on (703) 305 - 4704. The fax phone number for this Group is (703) 305 - 3988.

36. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305 -8576.

Jean Jeanglaude

April 28, 1998

MICHAEL HORABIK
SUPERVISORY PATENT EXAMINER
GROUP 2700

Notice of References Cited

Application No.	Applicant(s)
08/822,024	Alain Charles

Examiner	Group Art Unit	
Jean Jeanglaude	2735	Page 1 of 1

U.S. PATENT DOCUMENTS

	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS
A	5,600,312	02-04-97	Willard et al.	340	825.47
B					
C					
D					
E					
F					
G					
H					
I					
J					
K					
L					
M					

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS
N						
O						
P						
Q						
R						
S						
T						

NON-PATENT DOCUMENTS

	DOCUMENT (Including Author, Title, Source, and Pertinent Pages)	DATE
U		
V		
W		
X		

US005600312A

United States Patent [19]

Willard et al.

[11] Patent Number: 5,600,312

[45] Date of Patent: Feb. 4, 1997

[54] MESSAGING SYSTEM AND METHOD HAVING ROAMING CAPABILITY AND CONTROLLED GROUP MESSAGING

[75] Inventors: **David F. Willard**, Plantation; **Robert J. Schwendeman**, Pompano Beach; **Eric T. Eaton**, Lake Worth; **Barbara D. Laflin**, Ocean Ridge, all of Fla.

[73] Assignee: **Motorola, Inc.**, Schaumburg, Ill.

[21] Appl. No.: **401,317**

[22] Filed: **Mar. 9, 1995**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 378,136, Jan. 24, 1995.

[51] **Int. Cl.**[6] **H04Q 7/18**

[52] **U.S. Cl.** **340/825.47**; 340/311.1; 340/825.44; 379/56; 455/57.1

[58] **Field of Search** 455/186.1, 38.2, 455/57.1; 340/22, 37, 311.1, 825.44, 825.47, 825.52, 825.68, 825.69; 379/56, 57

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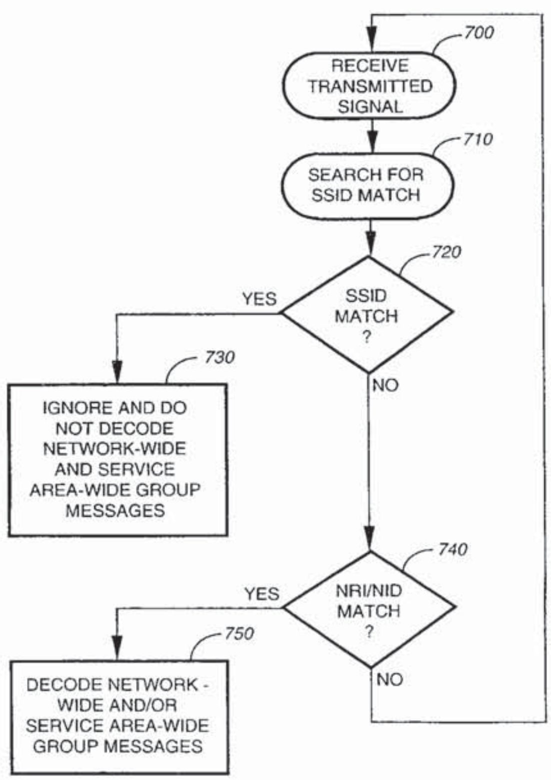
Primary Examiner—Michael Horabik
Assistant Examiner—William H. Wilson, Jr.
Attorney, Agent, or Firm—D. Andrew Floam

[57] **ABSTRACT**

A messaging system and method capable of transmitting group messages throughout a Network (**200**) such that receivers which are outside of a "local" or "home" area of coverage receive such group messages, whereas receivers which are in a "local" area of coverage over ride and do not receive the group message as a result of decoding system identifiers and ignoring those messages having network roaming identification.

12 Claims, 11 Drawing Sheets



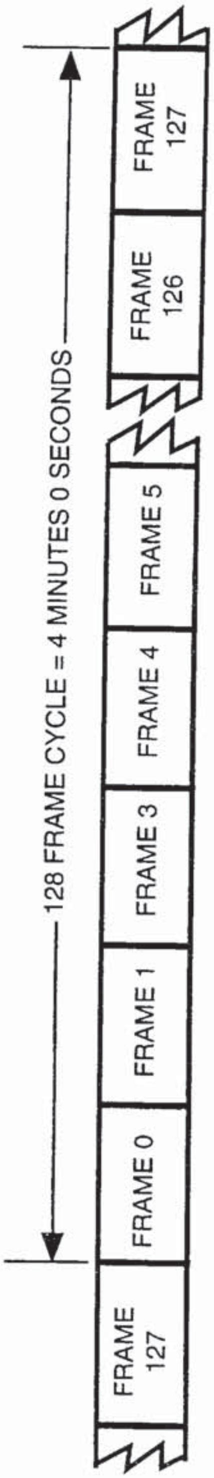


FIG.1

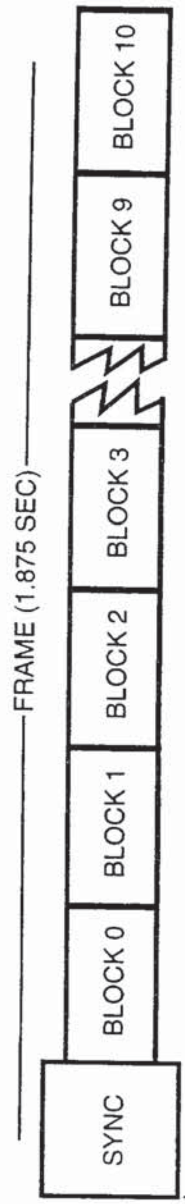


FIG.2

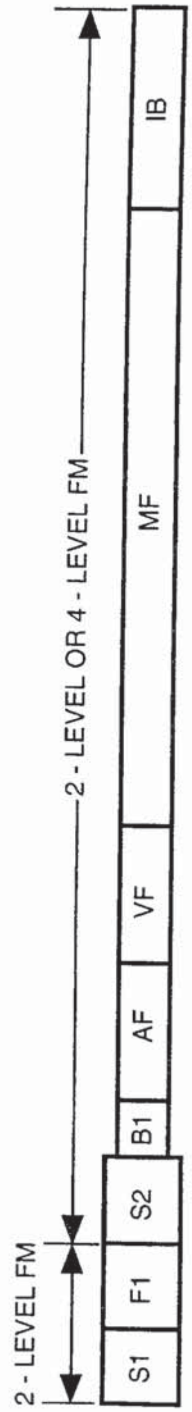


FIG.3

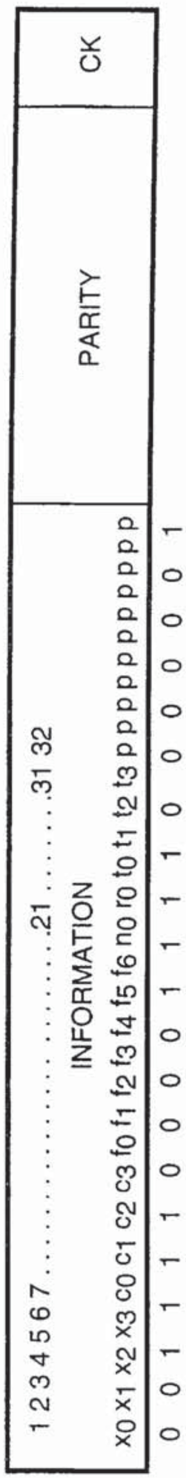


FIG. 4

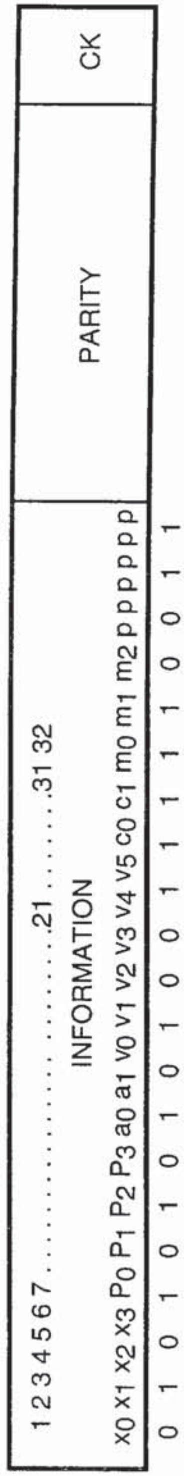


FIG. 5

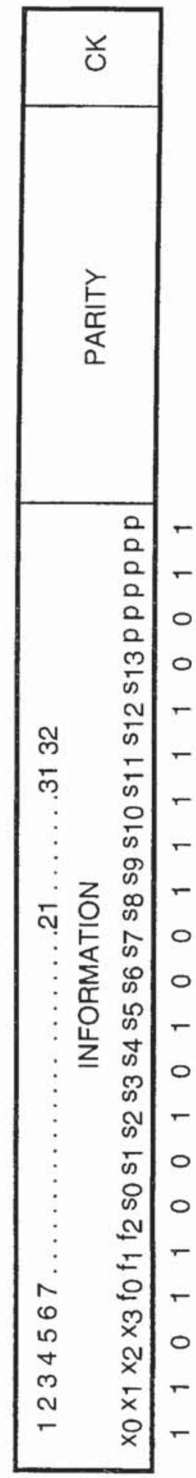


FIG. 6

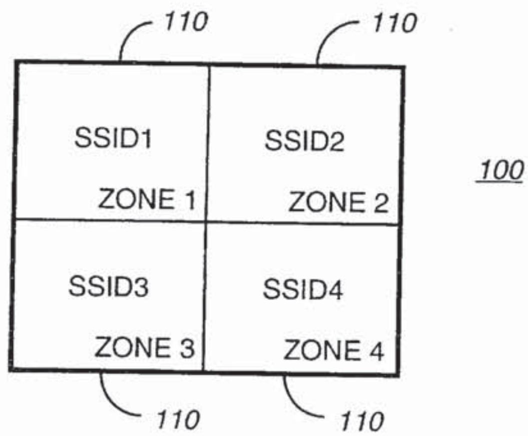

110
110
SSID1
ZONE 1
SSID2
ZONE 2
SSID3
ZONE 3
SSID4
ZONE 4
110
110
100

FIG. 7

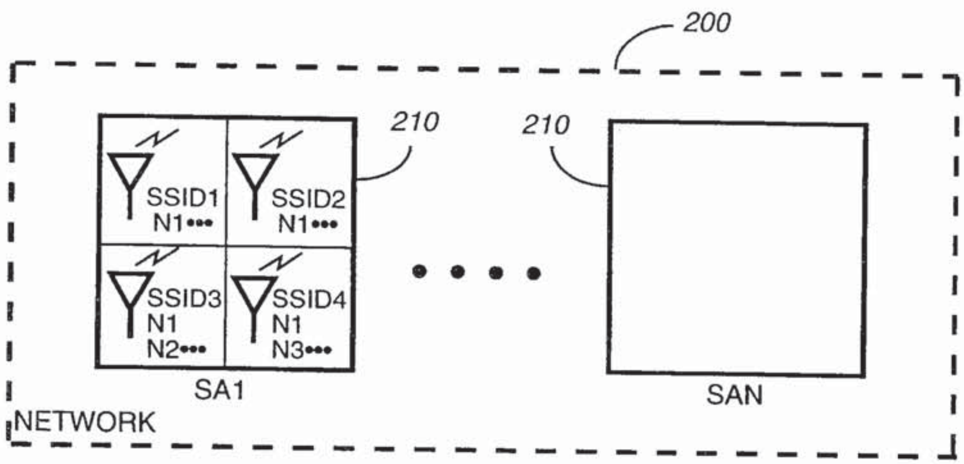

200
210
210
SSID1
N1•••
SSID2
N1•••
SSID3
N1
N2•••
SSID4
N1
N3•••
SA1
SAN
NETWORK

FIG. 8

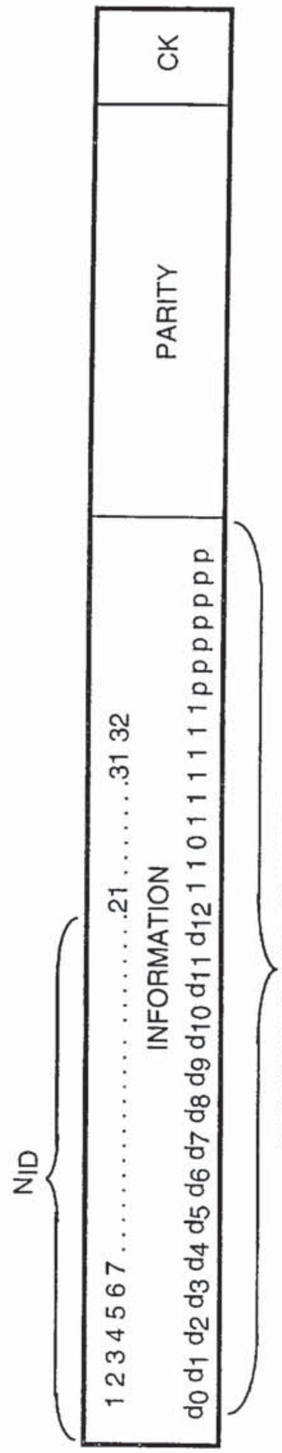

CK
PARITY
1 2 3 4 5 6 7 .... 21 .... 31 32
INFORMATION
d0 d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11 d12 1 1 0 1 1 1 1 1 1 p p p p p p
NID
RECEIVER ADDRESS WORD

FIG. 9

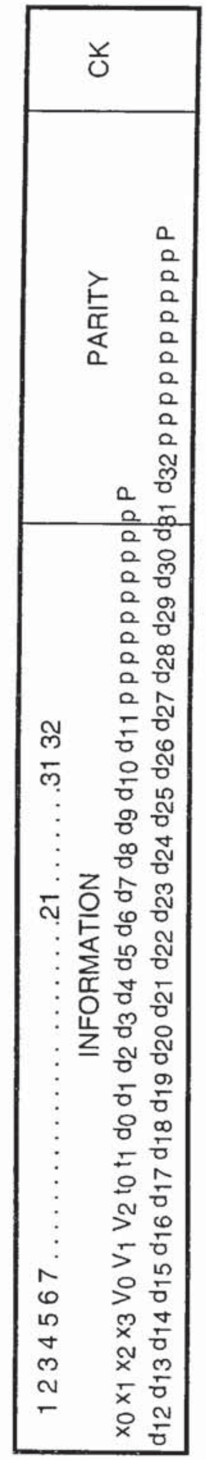

CK
PARITY
1 2 3 4 5 6 7 .... 21 .... 31 32
INFORMATION
x0 x1 x2 x3 V0 V1 V2 t0 t1 d0 d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11 p p p p p p p p p P
d12 d13 d14 d15 d16 d17 d18 d19 d20 d21 d22 d23 d24 d25 d26 d27 d28 d29 d30 d31 d32 p p p p p p p p p p P

FIG. 10

FRAME	A	B	C	D
0	LID1 T LID2	T	T	T
1		LID1 LID2		
2			LID1 LID2	
3				LID1 LID2
4	LID1			
5		LID1		
6			LID1	
7				LID1
8	LID1			
9		LID1		
10			LID1	
11				LID1
12	LID1			
13		LID1		
14			LID1	
15				LID1
16	LID1			
17		LID1		
18			LID1	
19				LID1
20	LID1			
• • • 127				LID1

FIG. 11

FRAME	A	B	C	D
0	LID1 LID2 N1	T T	T	T
1		LID1 LID2		
2			LID1 LID2	
3				LID1 LID2 N4
4	LID1 N5			
5		LID1 N7 N6		
6			LID1	
7				LID1 N8
8	LID1 N9			
9		LID1 N10		
10			LID1	
11				LID1
12	LID1			
13		LID1 N2		
14			LID1	
15				LID1 N3
16	LID1			
17		LID1		
18			LID1	
19				LID1
•	LID1			
•				
•				
•				
127				LID1

FIG. 13

FRAME	A	B	C	D	
0	LID1 LID2 N1	T T2	T1 T2	T1 T2	T1
1		LID1 LID2 N2			
2			LID1 LID2 N3		
3				LID1 LID2 N4	
4	LID1 N5				
5		LID1 N6			
6			LID1 N7		
7				LID1 N8	
8	LID1 N9				
9		LID1 N10			
10			LID1 N1		
11				LID1 N2	
12	LID1 N3				
13		LID1 N4			
14			LID1 N5		
15				LID1 N6	
16	LID1 N7				
17		LID1 N8			
18			LID1 N9		
19				LID1 N10	
• • • 127	LID1 N1			LID1	

FIG. 12

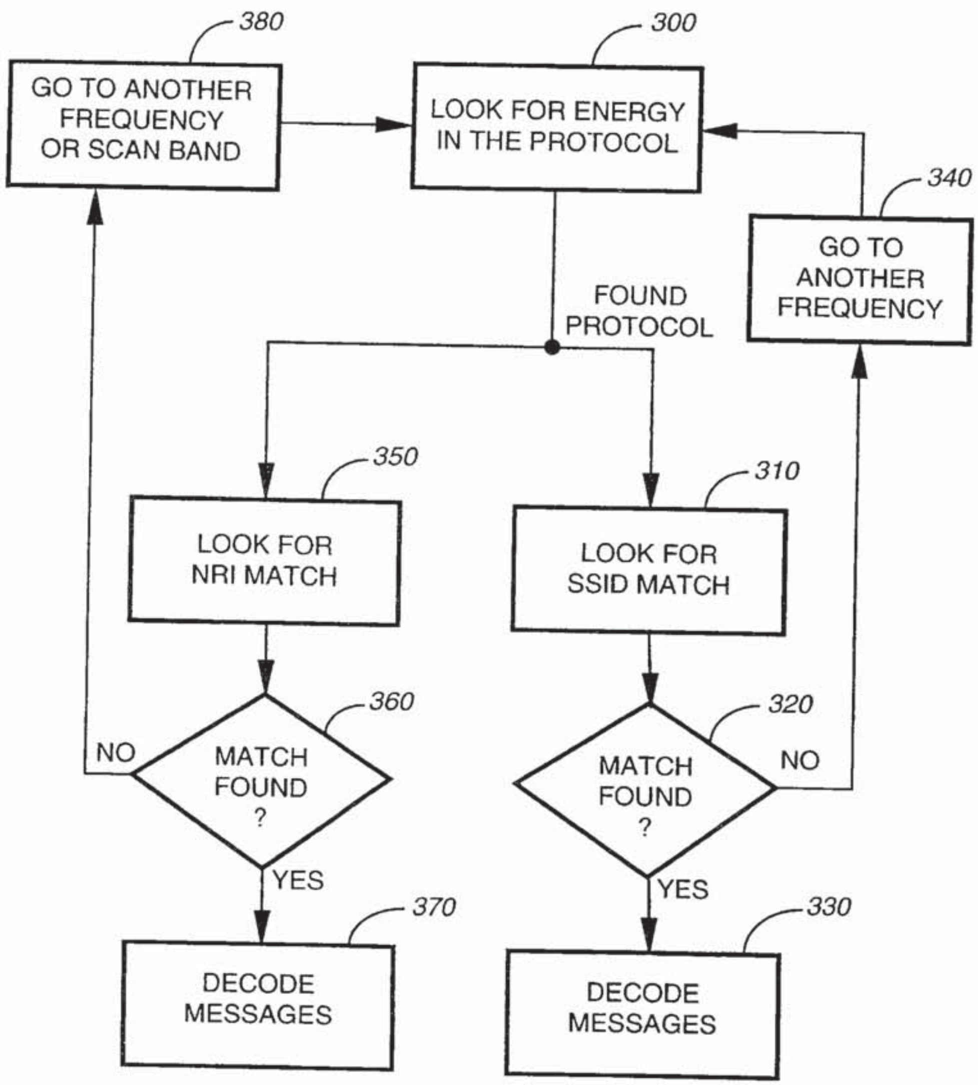

380
GO TO ANOTHER FREQUENCY OR SCAN BAND
300
LOOK FOR ENERGY IN THE PROTOCOL
340
GO TO ANOTHER FREQUENCY
FOUND PROTOCOL
350
LOOK FOR NRI MATCH
310
LOOK FOR SSID MATCH
360
MATCH FOUND ?
NO
YES
320
MATCH FOUND ?
NO
YES
370
DECODE MESSAGES
330
DECODE MESSAGES

FIG. 14

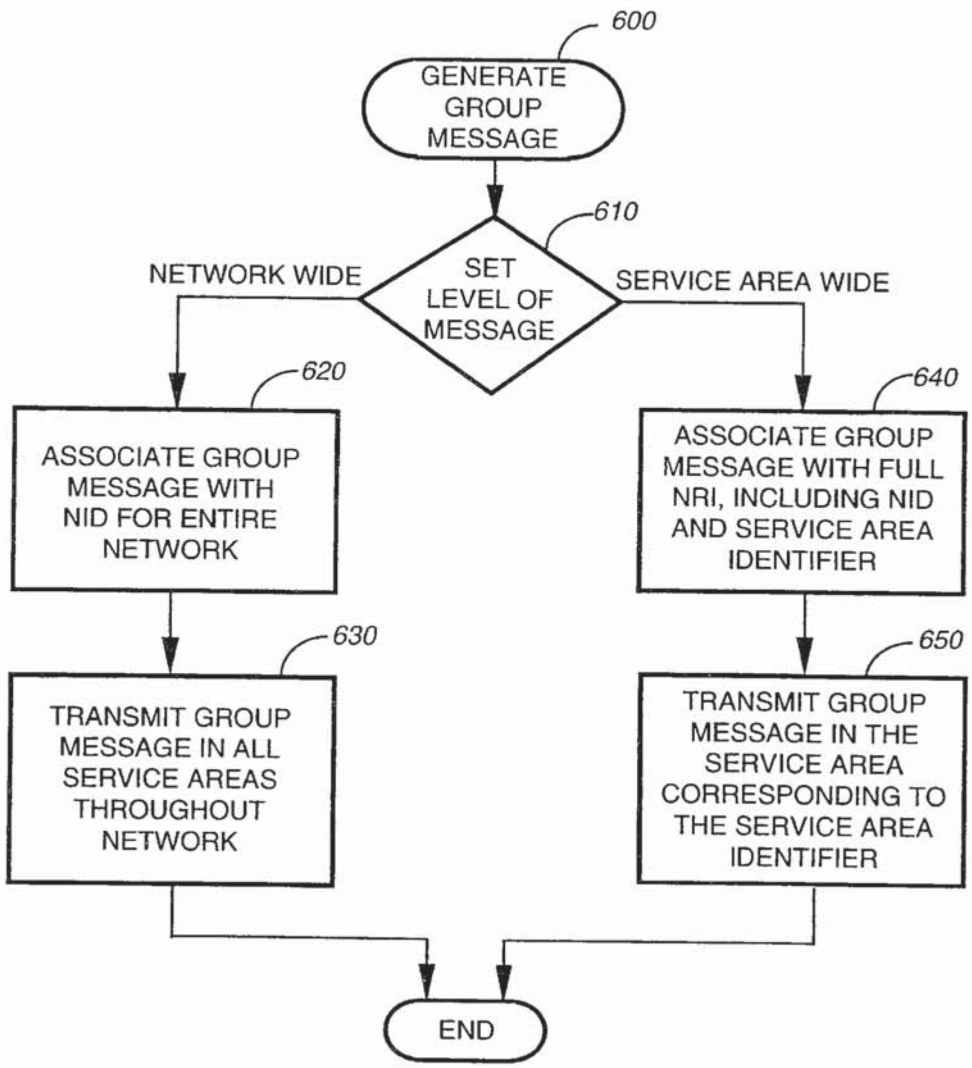

600
GENERATE GROUP MESSAGE
610
SET LEVEL OF MESSAGE
NETWORK WIDE
SERVICE AREA WIDE
620
ASSOCIATE GROUP MESSAGE WITH NID FOR ENTIRE NETWORK
630
TRANSMIT GROUP MESSAGE IN ALL SERVICE AREAS THROUGHOUT NETWORK
640
ASSOCIATE GROUP MESSAGE WITH FULL NRI, INCLUDING NID AND SERVICE AREA IDENTIFIER
650
TRANSMIT GROUP MESSAGE IN THE SERVICE AREA CORRESPONDING TO THE SERVICE AREA IDENTIFIER
END

FIG. 15

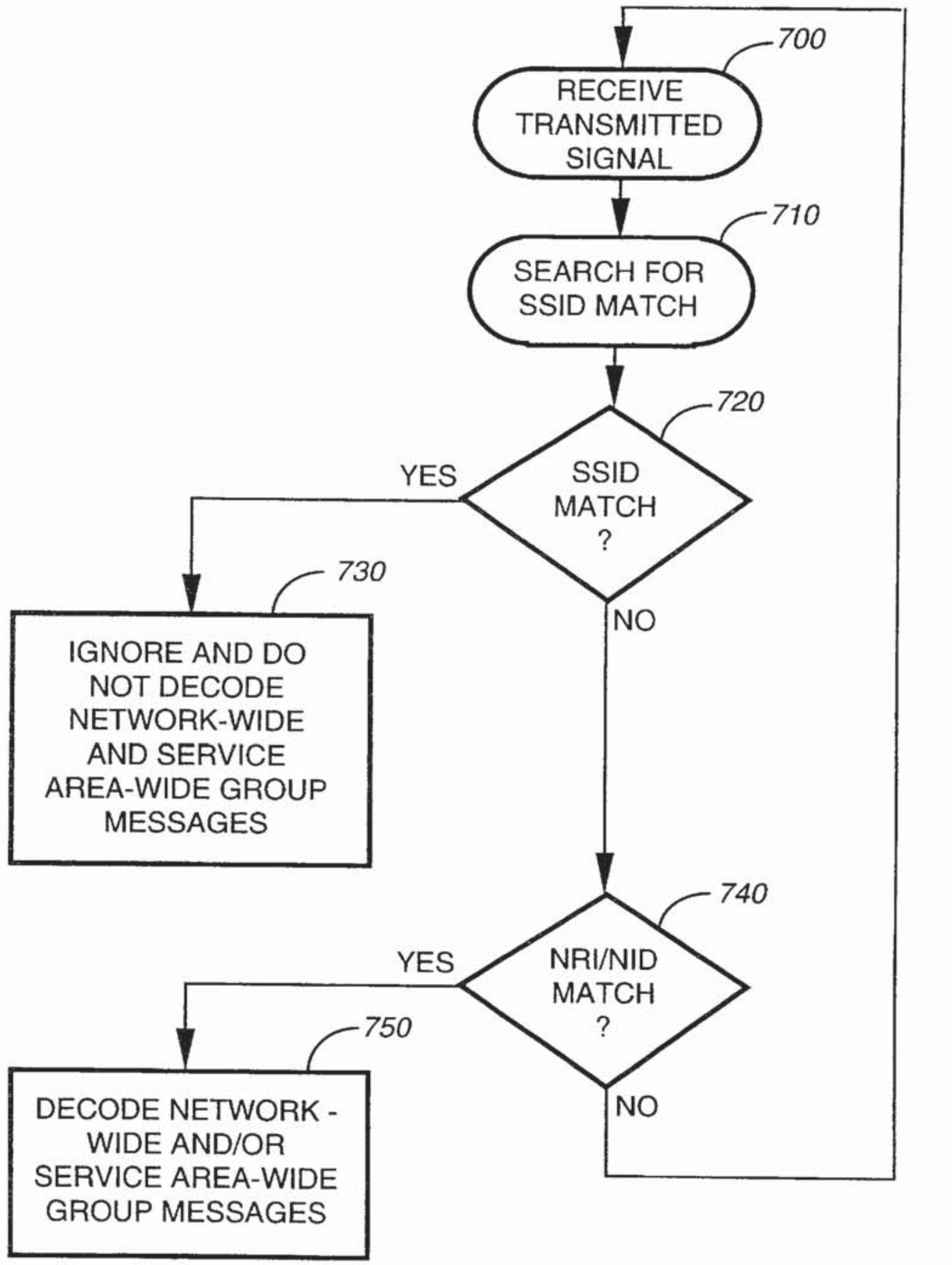

700
RECEIVE TRANSMITTED SIGNAL
710
SEARCH FOR SSID MATCH
720
SSID MATCH ?
YES
NO
730
IGNORE AND DO NOT DECODE NETWORK-WIDE AND SERVICE AREA-WIDE GROUP MESSAGES
740
NRI/NID MATCH ?
YES
NO
750
DECODE NETWORK - WIDE AND/OR SERVICE AREA-WIDE GROUP MESSAGES

FIG. 16

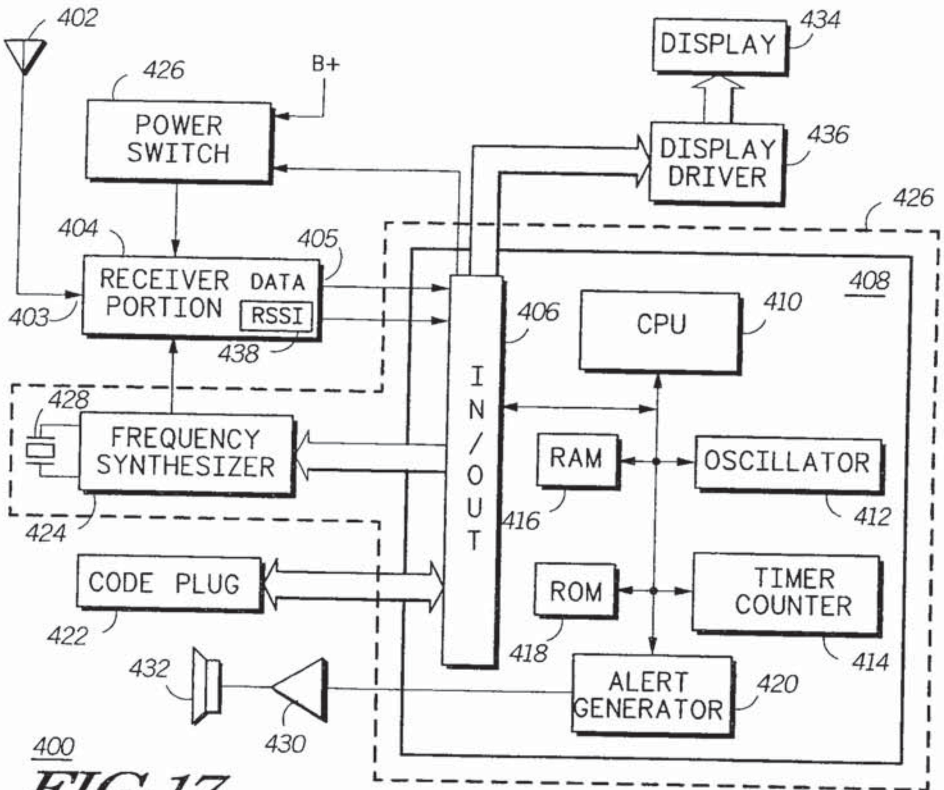

402
426
B+
POWER SWITCH
DISPLAY
434
DISPLAY DRIVER
436
426
404
405
RECEIVER PORTION
DATA
RSSI
403
438
408
406
CPU
410
I N / O U T
428
FREQUENCY SYNTHESIZER
RAM
OSCILLATOR
424
416
412
CODE PLUG
ROM
TIMER COUNTER
422
418
414
432
ALERT GENERATOR
420
430
400

FIG.17

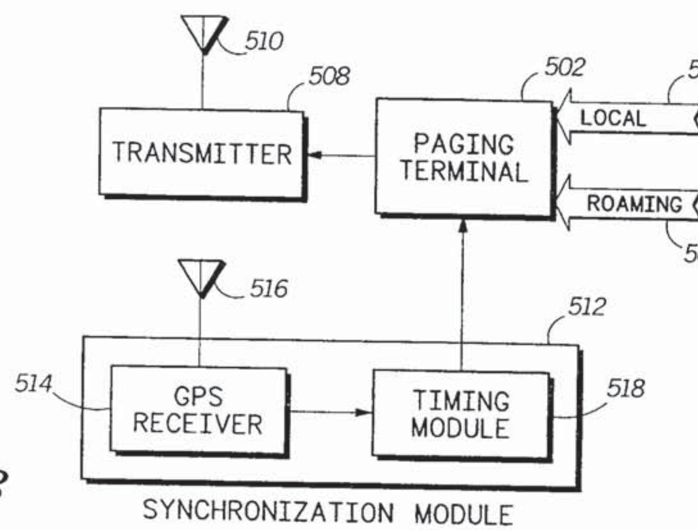

510
508
502
504
TRANSMITTER
PAGING TERMINAL
LOCAL
ROAMING
506
500
516
512
514
GPS RECEIVER
TIMING MODULE
518
SYNCHRONIZATION MODULE

FIG.18

MESSAGING SYSTEM AND METHOD HAVING ROAMING CAPABILITY AND CONTROLLED GROUP MESSAGING

RELATED APPLICATION

The present application is a continuation-in-part of commonly assigned application entitled "Messaging System Having Roaming Capability", Ser. No. 08/378,136 filed on Jan. 24, 1995, to Willard et al. our Docket No. PT01917U.

FIELD OF THE INVENTION

The present invention relates to messaging systems, and more particularly to a messaging system having the capability for a receiver to roam and receive messages across a multitude of coverage areas.

BACKGROUND OF THE INVENTION

In today's mobile society, it is desirable to be reachable, such as, by a selective call receiver (pager), everywhere one travels, both locally close to home, as well as in more distant locations in the same country or across the world.

A messaging method and system that is capable of accommodating roaming portable communication receivers, such as pagers, between coverage areas of the same service provider and across coverage areas of different service providers is extremely useful. It is additionally desirable to transmit group messages to those receivers which are roaming outside of "home" areas, while preventing the delivery of group messages to those receivers which are in their "home" areas.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a signaling protocol suitable for message transmission to a plurality of addressable receivers which is capable of accommodating message transmission to receivers which roam between service coverage areas.

It is a further object of the present invention to provide a signaling protocol suitable for message transmission to a plurality of addressable receivers which is capable of accommodating roaming receivers and maintaining battery saving performance in the receivers.

It is another object of the present invention to provide a signaling protocol suitable for message transmission to a plurality of addressable receivers which is capable of accommodating roaming receivers have frequency scanning capability.

It is a further object of the present invention to provide a signaling protocol suitable for message transmission to a plurality of addressable receivers which is capable of accommodating roaming receivers, and in which channel selection and roaming information comparisons made in the receiver are simplified.

It is still a further object of the present invention to provide a signaling protocol suitable for message transmission to a plurality of addressable receivers which is capable of accommodating roaming receivers and to provide a receiver with a confirmation of its roaming status.

It is yet another object of the present invention to accommodate multiple protocols on the same channel as well as roaming operation on a radio frequency channel shared by two or more service providers.

It is even a further object of the present invention to provide an efficient process to combine and redirect roaming traffic in a messaging system.

Still another object is to provide controlled group messaging to receivers such that receivers which are outside of a "local" or "home" area of coverage receiver group messages, whereas receivers which are in a "local" area of coverage over ride and to not receive the group message.

The above and other objects and advantages will become more readily apparent when reference is made to the following description, taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. **1–3** are timing diagrams illustrating a signaling protocol in accordance with the present invention.

FIG. **4** illustrates a structure of a frame information word according to the present invention.

FIGS. **5** and **6** illustrate structures of block information words in which single simulcast identification (SSID) information is coded.

FIG. **7** illustrates a coverage area and zone divisions in accordance with the present invention.

FIG. **8** illustrates a network and service area divisions in a network according to the present invention.

FIG. **9** and **10** illustrate structures of an address word and a vector word, respectively, in which network roaming identification (NRI) information is coded in accordance with the present invention.

FIG. **11** is frame diagram illustrating the placement of the SSID and time information in accordance with the present invention.

FIG. **12** is a frame diagram illustrating a first placement configuration of the NRI information in accordance with the present invention.

FIG. **13** is a frame diagram illustrating a second placement configuration of the NRI information in accordance with the present invention.

FIG. **14** is a flow chart generally illustrating how a receiver detects SSID and NRI information.

FIG. **15** is a flow chart illustrating how a group message is generated and transmitted according to the present invention.

FIG. **16** is a flow chart illustrating how a group message is received or not received by a receiver, according to the present invention.

FIG. **17** is an electrical block diagram of a selective call receiver in accordance with the present invention.

FIG. **18** is an electrical block diagram of a transmitter station in a paging system according to the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

The present invention is directed to a selective call communication system capable of servicing or transmitting messages to receivers roaming between coverage areas. An example of a selective call signaling system to which the present invention relates is disclosed in commonly assigned U.S. Pat. No. 5,128,665. The entire text and drawings of U.S. Pat. No. 5,128,665 are herein incorporated by reference. The present invention, however, is not in any way limited to a particular type of signaling protocol, and has utility in many types of communication systems, a paging or messaging system being only an example.

The present invention is directed to an enhancement to a messaging system, such as the one disclosed in the aforementioned co-pending applications. In this regard, FIGS. **1–14** and **17** and **18** are duplicates of drawings found in the co-pending application. A description of each of these drawings is provided herein for the sake of completeness. FIGS. **8**, **15** and **16** particularly illustrate the enhancement.

Referring to FIGS. **1–3**, an example of a selective call communication system to which the present invention pertains is shown. The signaling system shown comprises 128 frames, with each frame numbered 0 to 127. The frames are transmitted at 32 frames per minute, and thus a full 128 frame cycle lasts 4 minutes. One hour is divided into 15 cycles numbered 0 through 14. It is a synchronous time slot protocol tied to a universal time reference. Frame **0** is synchronized to the start of each hour so that the receiver can derive real time from the current frame and cycle number, thus providing the receiver accurate time within the hour with no need for adjustment.

Moreover, the protocol supports multiple time division multiplexed "phases", wherein for example, a 6400 bits per second (bps) data stream is time division multiplexed into four data streams of 1600 bps. Such a signaling structure is disclosed in commonly assigned U.S. Pat. No. 5,168,493, the entire text and drawings of which is herein incorporated by reference. Thus, the general frame structure shown in FIG. **1** for the single phase shown in FIG. **1** is the same throughout each of four phases.

Each frame comprises a sync portion and several blocks. The sync portion further comprises a Sync **1** portion (S**1**), a frame information (FI) word and a Sync **2** portion (S**2**).

Each receiver is assigned a base frame in the set of 128 frames appearing on an radio frequency (RF) channel. A receiver can trade battery life for the more frequent delivery of messages by being assigned to monitor more than one frame per cycle. Once a receiver acquires synchronization to the RF channel, it expects to find its assigned frame within a very tight time window. The use of 4-level FM doubles the data transmission rate per symbol (as compared to 2-level FM) which helps to reduce the effect of simulcast distribution errors and the effect of propagation timing differences between multiple signals within the capture range of the receiver.

As shown in FIG. **3**, the Sync **1** (S**1**) portion of each frame provides for frame timing, symbol timing and indicates the speed of the remainder of the frame. The frame information (FI) word carries 11 bits for the frame and cycle numbers, 5 bits for indication of the time division multiplexed phase of low traffic, 1 bit called a Network Roaming Channel Bit to indicate the presence of a frequency supporting Network-wide roaming service, and other information. The Network Roaming Channel Bit is used to trigger recognition of certain network roaming information which will be described in conjunction with FIG. **4**.

The Sync **2** (S**2**) portion provides for synchronization at the frame's block speed to allow for proper de-multiplexing and decoding of the blocks.

The Block Information (BI) field is the first **1–4** words, called block information worlds, of the first interleaved block and contains frame and system structure information, some of which is pertinent to the present invention and is explained in greater detail hereinafter.

The address field (AF) starts directly after the block information words and consists of short addresses and long addresses. The vector field (VF) maintains a 1 to 1 relationship with the address field. The vector word points to the start word of the associated message. The message field (MF) contains the message words specified by the vector field. IB represents idle blocks which are unused and are filled with appropriate bit patterns. FIG. **4** illustrates the structure of the frame information word in greater detail. The various parameters in the frame information word are defined as follows:

C Cycle Number (0–14) c3c2c1c0 15/hour
f Frame Number (0–127) f6f5f4f3f2f1f0 128/cycle
n Network Roaming Channel Bit n=1 indicates network support for roaming and n=0 indicates no network support for roaming
r Repeat Paging Indicator
If r=1, t3t2t1t0 are reserved to indicate a repeat format exists
If r=0, tt3t2t1t0 are Low Traffic flags for each phase in a frame
t Definition dependent on value of "r"
At 3200 bits/sec t3=t2 and t1=to representing two phases in the frame
At 1600 bits/sec t3=t2=t1=tO representing one phase in the frame
t=1 Indicates address field contained in block 0
t=0 Indicates address field extends past block 0
These flags give early indication that the traffic is light and all addresses are contained within block 0.
x Standard 4 bit Check Character

FIG. **5** illustrates an example of block information word **1**. Block information word **1** has 2 "a" bits, **a0a1**, which indicate the start of the address field, 6 "v" bits **v5v4v3v2v1v0** which define the start of the vector field, 2 "c" bits **c1c0** which indicate traffic overflow into the next frame(s), 3 "m" bits **m0m1m2** which indicate the number of high order frame number bits to be masked and 4 "P" bits **P3P2P1P0**, which indicate the number of priority addresses at the beginning of the address field.

FIG. **6** illustrates an example of block information words **2**, **3** and **4**. Word Format Type is represented by format bits **f2f1f0**, s represents the data and x again is the standard 4 bit Check Character.

Below is a table which illustrates the bit pattern definitions for the f and s bits shown in FIG. **6**. Depending on the values of bits **f2f1f0**, the data bits **s13**-**s0** have a particular meaning or application. When **f2f1f0** is set to (**000**), bits **s13**-**s0** represent a 9 bit local identification (LID) number (**i8**-**i0**) which identifies 512 possible LID's, and a 5 bit Zone number **C4C3C2C1C0**, which represents 32 possible coverage Zones associated with a particular LID.

$f_2\ f_1\ f_0$	$s_{13}\ s_{12}\ s_{11}\ s_{10}\ s_9\ s_8\ s_7\ s_6\ s_5\ s_4\ s_3\ s_2\ s_1\ s_0$	
000	$i_8\ i_7\ i_6\ i_5\ i_4\ i_3\ i_2\ i_1\ i_0\ C_4\ C_3\ C_2\ C_1\ C_0$	512 Local IDs, 32 Coverage Zones
001	$m_3\ m_2\ m_1\ m_0\ d_4\ d_3\ d_2\ d_1\ d_0\ Y_4\ Y_3\ Y_2\ Y_1\ Y_0$	Month, Day, Year
010	$S_2\ S_1\ S_0\ M_5\ M_4\ M_3\ M_2\ M_1\ M_0\ H_4\ H_3\ H_2\ H_1\ H_0$	Sec., Min., Hr.
011	Reserved for Future Use	
100	Reserved for Future Use	
101	$z_9\ z_8\ z_7\ z_6\ z_5\ z_4\ z_3\ z_2\ z_1\ z_0\ A_3\ A_2\ A_1\ A_0$	Data, System Message
110	Reserved for Future Use	
111	$C_9\ C_8\ C_7\ C_6\ C_5\ C_4\ C_3\ C_2\ C_1\ C_0\ T_3\ T_2\ T_1\ T_0$	Country Code, Traffic Splitting Flags

When f2f1f0 is set to (**001**) and (**010**), the data bit pattern s**13**-s**0** represents month, day, year, second minute and hour information as shown in FIG. **7**. The **f2f1f0** bit pattern (**101**) designates spare data bits s**13**-s**9**, a system message A**3**-A**0** and time zone information Z**3**-Z**0**.

Finally, of importance is the **f2f1f0** bit pattern (**111**), which indicates a 10 bit Country Code c**9**-c**0** and 4 bits called Traffic Splitting Flags, both of which will be described in more detail hereinafter.

The Country Codes follow, for example, the CCITT Standard which is well known in the art. The 10-bit Country Code is provided to permit reuse of LID's in different countries, following the CCITT standard assignment rules. Country Code information is useful by the non-subscribing receiver to facilitate a more efficient scan search by first identifying in what country the receiver is located.

With reference to FIG. **7**, the smallest division of a coverage area **100** is defined by a simulcast system identification (SSID), which is also referred to hereinafter as a "system identifier". An SSID consists of and is uniquely identified by several identifiers: an local service provider identifier or "LID", Zone, Country Code, Traffic Splitting Flags (TSF's) and Frequency. Each Zone **110** has a unique SSID. Thus, if a user desires to receive messages in more than one Zone, the receiver carried by that user would store each of the corresponding SSID's. The Zones shown in FIG. **7** need not be geographically adjacent one another.

In the example shown in FIG. **7**, there are 512 possible LID's, each with 32 possible Zones. A "Zone" is a single simulcast area which may be associated with other simulcast areas in a coverage area through a common LID. For example, a service provider is given LID **123456789**XXXXX. The service provider has the option to assign this LID to **32** different divisions of a coverage area or Zone. The northern part of a service provider's coverage area may be Zone **1** and would transmit **12345678900001**, whereas a southern part is Zone **2** and transmits **12345678900010**.

The Traffic Splitting Flags indicate the assignment of 4 groups of roaming traffic to a frequency (channel). Each roaming receiver which finds a frequency to carry a valid LID responds to only one of the 4 Traffic Splitting Flags. When a receiver's assigned flag is equal to 0, the receiver searches for another frequency with the same LID and the assigned flag set equal to 1.

1st Word (000)	9 bits = 512 LID's 5 bits = 32 Zones
2nd Word (111)	10 bits = 1024 Country Codes 4 bits = Traffic Splitting Flags

The 1st Word, called LID**1** hereinafter, corresponds to the first Block information word (**000**) referred to in FIG. **3**, and the 2nd Word, called LID2, corresponds to Block information word (**111**).

Time and calendar information (block information words **f2f1f0=001**, **010** and **101**) when transmitted, are defined to occur in frame **0**, or otherwise in the first valid frame following frame **0**. In a roaming capable system, the LID together with the Zone, Country Code and Traffic Splitting Flags occupy the second and third block information words in frame **0**. The fourth block information word carries the three available time and calendar information words and are sent in the fourth block information word position in frame **0** in a rotating sequence one block information word at a time over 3 consecutive cycles. This allows the block information words in **001**, **010** and **101** to be updated 5 times each hour.

An advantage of this scheme is that these messages are delivered without addresses. System information is used to attach a vector and message to it.

Bits A**3**-A**0** define the type of message and a class of receiver for which it is intended, as shown in the table below. As an example, all receivers should look at this message, receivers which are using SSID frequency information should only look at this message, and/or only receivers which are using network roaming information (NRI) (to be described hereinafter) to lock to this channel should look at this message. Also instructions on which frequency to go to when a Traffic Splitting Flag is changed, and time zone information can be sent.

A3	A2	A1	A0	
0	0	0	0	All message
0	0	0	1	Local message
0	0	1	0	Roam message
0	0	1	1	Roam Instruction
0	1	0	0	Time Zone
****				
1	1	1	1	Reserved for future use

When a system message is indicated, an additional vector is added to the end of the vector field. A receiver decodes block information **4** and determines instruction type and which receivers should look at the message associated with this block information word. After the receiver has determined that it should look at the message it processes the address field and vector field as normal but there will be an additional vector at the end of the vector field. Only the receivers which are instructed to look for a message will look at this vector because all the address/vector combinations will point at message words that are located after this vector which is actually in the location of the first message word for the message field. Up to this point, a certain group of receivers have been informed that there is a message, what type of message to expect, and where to look for this message. Once the receiver enters the message field it decodes the message and handles it according to the message type.

An example of a system message is a greeting message transmitted to a receiver which is roaming into a coverage area outside of its home coverage area.

Another example of the utility of a system message is in connection with the Traffic Splitting Flags. When a service provider has two systems which have the same coverage area (i.e., redundant systems) or overlapping portions of coverage areas, and would like to move traffic from one of the systems to another, the following process is performed.

A system message as described above is sent out informing the receiver of there is going to be a traffic change and the traffic change information is a new frequency XXXXXX. The receiver adds this new frequency to its scan list. The receiver should move to XXXXXX frequency and look for an assigned SSID or NRI on this other frequency. In a later transmission, which could be one month later or it could be 1 minute later, the Traffic Splitting Flag is unset on one frequency and set on the other redundant coverage area system. The receiver detects that roaming traffic is no longer supported on this channel and moves to the frequency it was instructed to go to by the message. Once there, the receiver determines if the SSID or NRI and Traffic Splitting Flag is set correctly. When the SSID or NRI information stored in the receiver match the corresponding transmitted information, the receiver stays on the frequency (and adds this frequency to its scan list). When a match is not made, the receiver will go back to the frequency it was originally on to make sure that it was not a mistake. When that frequency no longer supports the receiver's roaming traffic, the receiver will start looking on its own (scanning the band) for an SSID or NRI match.

identifier (SA) Traffic Splitting Flags, and a 3-bit NID multiplier to expand the number of unique Networks.

A Network may be formed by an agreement between several otherwise separate service providers, or may be a single large service provider. In a Network, there is a plurality of Service Areas, and in the example described herein, there are 32 possible Service Areas within a Network, identified by a 5 bit pattern, but a Network may be defined to consist of many more or less Service Areas.

As shown in FIG. **8**, in each Zone of a Service Area, one SSID is transmitted and at least one, by possibly several, NRI's are transmitted, as indicated by **N1**, **N2**, etc. Thus, one Zone is potentially affiliated with multiple Networks or Service Areas, and would be required to transmit corresponding NRI's. The boundaries shown FIG. **8** depict functional boundaries, and not necessarily geographical boundaries. However, no matter where geographically located, all Service Areas within a common Network are required to transmit the same NID sequence or Network identifier. Individual Service Areas within a Network are specified by the Service Area identifier.

FIGS. **9** and **10** illustrate the manner in which the NRI is encoded in the signal transmitted in each Service Zone. FIG. **10** illustrates a conventional **32-21** binary coded hexadecimal (BCH) address word, which is well known in the art. The first, 21 bits, d**0**–d**20** of this word are used to define an NID, 12 bits of which are used to uniquely identify 4096 networks, as an example.

FIG. **10** illustrates the vector word structure associated with the address word of FIG. **9**. The table below gives the bit definitions associated with the vector word of FIG. **10**.

t_1t_0	$d_{11}d_{10}d_9d_8\ d_7d_6d_5d_4\ d_3d_2d_1d_0$	
00	$c_3c_2c_1c_0b_3b_2b_1b_0a_3a_2a_1a_0$	- 3 Numeric Characters with Short Address or 8 Numeric Characters with Long Add.
	$a_{11}a_{10}a_9 \ldots a_0$	or 12 bits usable for Roaming Networks
01	$s_8s_7s_6s_5s_4s_3s_2s_1s_0S_2S_1S_0$ -·	8 Sources plus 9 or 30 Unused Bits
10	$s_1s_0R_0N_5N_4N_3N_2N_1N_0S_2S_1S_0$	8 Sources, 0–63 Message Number, Message Retrieval Flag, and 2 or 23 Unused bits
11		Spare Message Type

Another way to handle traffic splitting is for the system to unset the Traffic Splitting Flag and let the receiver find a new system transmitting that receiver's SSID or NRI.

It should be understood from the foregoing that the same LID and Zone values may be used by the same provider or other providers on other channels.

Stored in each receiver is a list called a scan list, which contains at least one SSID. In each Zone, an SSID is transmitted in a predetermined number of frames, as will be explained hereinafter in conjunction with FIG. **13**.

Turning now to FIG. **8**, in the case where a receiver desires coverage over a larger region, or to receive messages on multiple frequencies, which would otherwise be defined by multiple SSID's, a single piece of identification information is used, rather than multiple SSID's. This is called network roaming identification information (NRI). A "Network" **200** is defined as a collection of many Service Areas **210** and a Service Area **210** is a coverage area which would otherwise be defined by a plurality of SSID's. Thus, a Service Area **210** comprises multiple zones **110**. An NRI consists of a Network identifier (NID), a Service Area

Bits **V0V1V2** are used to specify the vector type, such an numeric, tone-only, etc. When the **V0V1V2** are set to a value corresponding to a particular type, such as short message/tone only, this signifies that the 12 bits d**0**–d**11** specify a Service Area, Traffic Splitting Flags and Network multiplier. For example, a**0**–a**4** define the Service Area (**32** possible) a**5**–a**8** are the Traffic Splitting Flags and a**9**–a**11** are Network multiplier bits. The Network multiplier bits allow for 8 times 4096 more unique NID's.

Similar to the case of a Coverage Area **110**, it is desirable to transmit group ("system") messages within a Network **200**. Furthermore, it is desirable to designate certain levels of group messages. Specifically, a Network-wide group message is designated to be transmitted throughout an entire Network. Examples of a Network-wide group message include advertisements of services offered by the Network, periodic greetings and service updates to receivers that are roaming outside of a home Service Area or possibly outside of a home Network. A Network-wide group message needs to be associated with a Network identifier or NID, which is common throughout a Network. A Service Area-wide group message is designated to be transmitted in a particular

Service Area(s) of a Network. Examples of Service Area-wide group messages are weather updates, special event updates, etc.

According to the present invention, it is desired that when a receiver is within its home area, one or more Zones, for example each of which are designated by an SSID (FIG. 8), then Network-wide and Service Area-wide group messages are not decoded by the receiver. This prevents unnecessary disturbances to the home or local receiver/user, such as a "Welcome to London" message transmitted every day or hour, if the user of that receiver resides in London. On the other hand, when a receiver is outside of its home area, then the group messages (Network-wide or Service Area-wide) are decodable by that receiver.

A mechanism to enable a receiver in its local or home area to over ride reception of a group message is shown in FIGS. 15 and 16, which will be described hereinafter.

In terms of incorporating the group message into the protocol of FIGS. 1–3, there are two ways in which the group message is transmitted. First, an NID is transmitted as it normally would be in the address field. The remainder of the NRI, those portions of the NRI other than the NID (traffic spliting flags, 3-bit multiplier and Service Area identifier), is placed in the message field. Specifically, a vector associated with the NID points to the remainder of the NRI in the message field. The group message associated with the NRI resides in the message field after the remainder of the NRI information. Thus, the group message is decoded by a receiver that has a stored NRI that matches the transmitted NRI.

Another way to alert a receiver of the presence of a group message is by transmitting the NRI related information twice in an address field within a frame. The first occurrence is the full NRI, including the NID, traffic splitting flags, 3-bit multiplier and Service Area identifier. The second occurrence is only the NID portion of the NRI, which has an associated vector that points to the message field where the group message is located. A receiver detects and correlates the first occurrence, the NRI and locks to the channel. The second occurrence, the NID, triggers the receiver to decode the group message associated with the address (NID). The NRI or NID may occur many times over an hour and possibly many times in a cycle, without having a message.

In either method, a Network-wide group message is achieved by associating the group message with an NID so that the group message is included for all Service Areas that are common to that NID. On the other hand, for Service-Area-wide group messages, the group message is associated with a particular full NRI. Thus, only receivers which correlate that particular full NRI will decode the (Service Area-wide) group message.

It should be understood that a receiver can store several NRI's (each with different NID's) to indicate that the receiver is subscribed to several Networks. Thus, such a receiver could find several Network matches on the same channel when all of the NRI's are converged into one system which, for example, covers a small town. One Network might service the eastern portion of the U.S., for example, and the other might service the western portion of the U.S., but the two Networks converge in the middle portion of the U.S. In the case of one system where many Networks of traffic collapse/overlap, the receiver will lock onto a channel by either NID match. In this case, the NID's act like independent addresses in the receiver and can be used to deliver independent group messages which relate to a corresponding Network.

In each Service Area, the transmitted signal includes the NRI associated with that Service Area. The placement structure of the various parts of the NRI in the signaling protocol is shown in FIGS. 12 and 13. In a receiver which is roaming in a Network, a frequency scan list is stored which includes a list of frequencies for which there is a high probability that an NRI match will be obtained. The placement structure of FIG. 13 provides for a way to predict where the NRI information can be found. In any event, when a match cannot be found from the stored scan list, then the receiver searches its entire synthesizer bandwidth. Once the receiver locks onto frame 0 on a particular frequency, a candidate frequency is qualified or disqualified quickly.

First, with reference to FIG. 11, the placement structure of the SSID information will be described, with reference to a four phase (time division multiplexed) expansion of the frame structure shown in FIG. 1. When a single phase system is used, then all of information in phases A, B, C and D collapse into the phase A. When a two phase system is used, then phases A and B collapse together to form one phase and phases C and D collapse together to form another phase.

As is well known in the art, a time division multiplexed system with multiple phases A, B, C and D provides certain traffic handling advantages for a service provider. A receiver capable of decoding information from only a single phase is assigned to a particular phase by the service provider at the time service is initiated. Some receivers are capable of decoding information from one phase at a time, but can switch to a different phase. In this case, a service provider can initially assign a receiver to a particular phase, but can use the system messages described above to inform the receiver from time to time that messages will be transmitted on a different phase. Finally, some receivers are capable of decoding multiple phases and can therefore, as shown by FIG. 11, lock onto an assigned frame quicker than a single phase receiver.

In order to provide roaming service, all channels (frequencies) in a system which are roaming-capable are required to transmit fully a predetermined number of frames. For example, it is required that all roaming channels transmit frames 0 through frame 15 with frame 0 aligned to the four minute time mark. It is established, in this example, that frames 0–15 must be present and that these frames contain the LID words LID1 and LID2 in the frames and phases as shown in FIG. 11.

Across the phases, LID1 and LID2 are offset by one frame so that a receiver assigned to a specific phase is able to determine its desired SSID presence in the least amount of search time on each channel, and to balance or distribute information overhead among the phases.

The placement structure shown in FIG. 11 provides a known time position to allow for quick processing of candidate frequencies when a receiver is roaming. If the roaming decision can be made on the basis of LID's only, then 16 channels can be processed every four minutes. Since frames 0–15 must be present, a fast scan over a large bandwidth is made possible using symbol rate detection to identify roaming capable channels. LID2 is transmitted only in each phase once per cycle and LID1 is transmitted every four frames, once in each phase (in at least frames 0–15).

On all frequencies (channels) which are roaming capable, only frames 16–127 may be shared with other service providers or replaced with an alternate protocol. When a frame is transmitted, it must contain a predetermined SSID pattern, such as, for example, the LID following the pattern established in frames 0–15.

"T" refers to the optional presence of three block information words sent out in frame **0** on a rotating basis to indicate time and calendar information, as described above. The "T" type block information words are sent out in all **4**, **2** or **1** phases depending on the system operating speed. It takes 3 cycles to completely refresh a receiver with a complete set of time and calendar information (5 updates each hour). The time/calendar instructions are optional, but when carried by the system, are required to follow the rotating pattern of one selection in every cycle. This format provides a known time/calendar position to permit a receiver to quickly process the candidate frequencies when roaming. The rotational sequence is changeable so that a "T" block information word format **101** is used to send a roaming system message when needed.

FIG. **12** illustrates a first placement configuration for NRI information, identified N**1**-N**10**. Like the LID's, the SSID information, NRI information is required to appear once during frames **0**–**15**. Thereafter, the pattern optionally continues in those additional frames available. When a service provider chooses to continue the NRI placement sequence past frame **15**, the sequence must include all NRI's active on the channel. The pattern shifts positions across phases and flames every four minutes (1 cycle) allowing a single phase pager which is synchronously decoding a channel to eventually see the NRI in its assigned frame. The detection of an NRI twice indicates that all NRI's have been examined.

The placement of 10 NRI's N**1**–N**10** are shown in FIG. **12** as an example. The NRI's are placed sequentially through the phases in an offset fashion, similar to the SSID placement structure of FIG. **11**. When a single phase is transmitted, then all of the information collapses into a single phase such that a different NRI appears in each of frame **0** through frame **9**. This structure is processed such that the sequence is offset by at least one frame in the next cycle to avoiding shadowing problems.

Turning to FIG. **13**, a second placement sequence for NRI information will be described. In this sequence, all NRI's supported on a channel are required to appear at least once during frames **0**–**15**. However, according to this configuration, an expected or predicted position for an NRI is determined by the following set of rules:

(a) Each frequency or channel is represented by a number in the range of 0–15. M=Modulo**16** of Integer {Freq kHz/Channel Spacing kHz}

(b) N=Modulo**16** of NID (4 least significant bits);

(c) C=cycle number (**0**–**15**); and

(d) Expected frame=F=Modulo**16** of N+M+C.

According these rules, it is possible to search 16 consecutive frequencies for the same NRI in the 30 second (16 frame) period at the beginning of each 4 minute period of time. It also causes the NRI to shift one frame each cycle which alleviates possible "shadow" problems in the case of a receiver located where two systems have overlap. This placement sequence has a lower NRI "overhead" for cases where the channel carries less than 16 NRI's.

In order to alert a pager that a group message is present, the NRI that corresponds to the group message is transmitted twice during Frames **0**–**15**. The second occurrence enables reception of the group message and acts s a normal address to send Numeric, Alphanumeric or HEX/Binary messages. Furthermore, sending the NRI twice allows receivers to predict the Frame and Phase of addressed message using the same rules described in conjunction with FIG. **13**.

Turning now to FIG. **14**, a procedure by which a roaming receiver decodes a message will be described. From the outset, it should be understood that there are a variety of receivers capable of roaming in accordance with the present invention, including single frequency receivers and frequency synthesized receivers which can lock to any frequency in a predetermined bandwidth. Also, both of these receivers may be fixed phase, variable phase or multiple phase receivers.

Regardless of receiver type, when entering a new area in which a receiver has yet to lock onto a signal transmitted in accordance with an established protocol, it is likely that from the last message receiving session the receiver has an approximation of the occurrence of frame **0** at some frequency. The accuracy of this approximation is dependent on the crystal oscillator in the receiver.

In step **300**, the receiver attempts to detect energy in the protocol on the last frequency on which it operated. When the receiver has an SSID subscription, the procedure follows on the right side of the flow chart. When the receiver has an Network coverage subscription, the procedure goes to the left side of the flow chart.

In step **310**, once frame **0** of a cycle is found, the receiver can detect and compare the SSID information encoded in the transmitted signal with its stored SSID information. This process is performed according to the placement rules described in conjunction with FIG. **11**. When a match is found as indicated in step **320**, the receiver can locate its assigned frame to decode the message(s) addressed to it in step **330**.

However, if the SSID in the transmitted signal does not match with the SSID stored in the receiver (accounting for the current frequency of the receiver), then in step **340**, the receiver switches to another frequency, if it is capable of doing so. When the receiver is a single frequency receiver, then it cannot tune to another frequency and will enter a time-out mode and/or a message is optionally displayed on a display of the receiver indicating its inability to receive messages in that current location of the receiver.

When the receiver has only NRI information stored in it, then from step **300**, the procedure goes to step **350** and looks for an NRI match, taking into account the NRI placement rules of FIG. **12** or FIG. **13**. When a match is found as indicated in step **360**, the receiver locates its assigned frame and decodes its addressed messages in step **370**.

However, in the event that a match is not found in step **360**, in step **380** the receiver tunes to another frequency by referring to a recent list of frequencies where matches have been previously found. When no such list exists in the receiver, then the receiver begins scanning across its band to look for energy in the protocol and the process repeats from step **300**.

When a single frequency receiver subscribes to Network coverage, then if a match is not found in step **350**, a message is optionally displayed on the receiver that the user has gone outside a subscription area, the receiver is not functioning properly, or the service provider is not transmitting information on that frequency. A time out period is initiated and the process repeated some period of time later in an attempt to find an NRI match.

Below an example of a scan list is shown. Generally, the first entry in the list is the last frequency and associated SSID or NRI that the receiver locked to. That is, a receiver will first look for an SSID match before looking to match an NRI, and will look for an NRI match after exhausting all possible SSID matches. An SSID match can be determined quickly. The NRI's are listed with an associated frequency. A receiver attempts to lock to the last frequency and associated SSID or NRI on which it received messages, and then proceeds through the SSID information, and finally the NRI information.

FREQUENCY	SSID	NRI
Frequency 1	—	NID1
Frequency 2	SSID2	
Frequency 5	SSID3	NID1
Frequency 3	—	NID1
Frequency 4	—	NID1
Frequency N	SSIDN	NID1

FIG. **15** illustrates how a group message is transmitted according to the present invention. Two methods of encoding of the group message into the protocol of FIGS. **1–3** has been described above. In step **600**, the group message is generated in a paging terminal (FIG. **18**) or other portion of a paging transmitter station. The group message is designated as either a Network-wide group message or a Service Area-wide group message in step **610**. If it is designated a Network-wide group message, then in step **620**, the group message is associated with an NID to permit transmission throughout an entire Network. It is envisioned that a Network-wide group message may be associated with multiple Networks through multiple NID's. In any event, in step **630**, the Network-wide group message is transmitted the Network corresponding to the NID to which the group message is associated.

On the other hand, if a group message is designated a Service Area-wide group message in step **610**, then in step **640**, the group message is associated with a full NRI (NID, Service Area identifier, 3-bit multiplier, etc.). Finally, in step **650**, the Service Area-wide group message is transmitted in the Service Area corresponding to the NRI to which the group message is associated. It is envisioned that a Service Area-wide group message may be associated with multiple Service Areas through multiple NRI's. This is particularly useful for sending a group message to Service Areas in a particular geographical region, or in a particular time zone, etc. However, as the number of Service Areas increase, it may become more efficient to transmit the group message throughout the entire Network.

With reference to FIG. **16**, the procedure by which a receiver decodes or does not decode a transmitted group message will be described. In step **700**, the receiver receives the signal transmitted in the Zone or Service Area where it is located. In so doing, in step **710**, the receiver first examines the signal to determine if an SSID is in the transmitted signal matches a stored SSID in the receiver. In step **720**, if an SSID match is determined, which is an indication that the receiver is in a "local" or "home" Zone, then in step **730**, any Network-wide or Service Area-wide group message is ignored and is not decoded. When an SSID match is not made in step **720**, then in step **740** the receiver examines the signal to determine if an NRI in the transmitted signal matches the stored NRI in the receiver. When an NRI match is made, then in step **750**, which occurs when the receiver is outside of a local or home Zone (because an SSID match was not made), the Network-wide or Service Area-wide group message is decoded. The manner in which the group message is decoded depends on which encoding method, described above, is used, and whether the group message is a Network-wide group message or a Service Area-wide group message.

Thus, the SSID is used to over ride a Network-wide or Service Area wide group message. When a receiver makes an SSID match, which can occur only when the receiver is located in a local or home Zone, then Network-wide and

Service Area-wide group messages are ignored. On the other hand, when an SSID match cannot be made, which occurs only when the receiver is located outside of its local or home Zone, the Network-wide and Service Area-wide group messages are decoded.

Thus, a group messaging method according to the present invention involves:

dividing a Network into a plurality of service areas, each service area comprising at least one zone;

assigning to each network a network roaming identifier (NRI) which comprises at least a network identifier (NID) and a service area identifier such that the network identifier is common throughout a network, the service area identifier for identifying a service area within a network;

assigning to each service area at least one system identifier (SSID) which comprises at least a local service provider identifier and a zone identifier for identifying a zone within a service area;

storing in at least one receiver subscribed for receiving messages in a particular network and in at least one particular service area in the particular network, a network roaming identifier associated with the particular network and at least one particular system identifier associated with the at least one particular service area;

generating a group message designated for a select group of receivers in a network;

associating the group message with at least a portion of the network roaming identifier;

generating a signal for transmission in each zone, the signal including at least one network roaming identifier corresponding to a network that includes a service area corresponding to that zone and a system identifier corresponding to that zone;

transmitting the signal in each zone;

in the at least one receiver, receiving a signal transmitted in a zone and decoding the system identifier in the signal and when the decoded system identifier corresponds to the at least one particular system identifier stored in the at least one receiver, ignoring the network roaming identifier and group message associated therewith in the received signal so as not to receive the group message, and when the at least one receiver determines that the decoded system identifier does not correspond to the stored particular system identifier, decoding the network roaming identifier and the group message associated therewith.

Summarizing, in order to indicate to a receiver that a group message is present in the transmitted signal, the step of transmitting comprises either transmitting the NID portion of the NRI in the address field, and placing the remaining portion of the NRI in the message field, followed by the group message. Alternatively, the step of transmitting involves transmitting the NID twice in a frame. The first occurrence is in conjunction with the occurrence of a full NRI twice to provide normal channel lock to recover addressed messages. The second occurrence is the NID which points to a group message in the message field.

Furthermore, the group message may either be a Network-wide group message, in which case it is associated with a Network identifier (NID), or a Service Area-wide group message, in which case it is associated with a full NRI.

In other words, the receiver, by locking onto a channel through an SSID, over rides the group message so as not to decode it. This occurs primarily when the receiver is in a "local" or "home" Zone of coverage where such an SSID is being transmitted. On the other hand, when the receiver cannot lock onto a channel through an NRI, then the decoding of a group message is not disabled and the receiver will decode the group message. This is the case when the receiver is outside of its "local" or "home" Zone of coverage where the receiver can receive messages only through matching an NRI or NID.

It is envisioned that in a receiver, several SSID's are possibly stored, and at least one SSID is designated a "home" SSID. There may be several "home" SSID's. This means that the receiver will attempt to match a received SSID in a transmitted signal with its home SSID('s) before attempting to match with other stored SSID's or possibly a stored NRI. In some circumstances, it is envisioned that when a match to a home SSID is not achieved, the receiver is programmed to search for an NRI match before attempting to match to the other non-home SSID's.

FIG. **17** shows an exemplary electrical block diagram of a receiver **400**, and particularly a selective call receiver, according to the present invention. Coded message signals transmitted are received by an antenna **402** which couples to the input **403** of the receiver portion **404**. The receiver portion **404** preferably is an FM receiver. The received coded message signals are processed by receiver portion **404** in a manner well known in the art, and provided at the output **405** as a stream of binary information. The output **405** couples to the input/output (I/O) port **406** of the microcomputer **408**. Receiver portion **404** optionally includes received signal strength indicating (RSV) means **438** which also connects to the I/O port **406** of the microcomputer **408**.

Microcomputer **408**, which is embodied, for example, by a Motorola MC68HC05 series microcomputer, performs a variety of functions, including decoding the binary information. Microcomputer **408** includes a CPU **410**, oscillator **412**, timer counter **414**, random access memory (RAM) **416**, read only memory (ROM) **418** and alert tone generator **420**. CPU **410** controls the operation of receiver **400** and processes the received coded message signals. Oscillator **412** provides the clock for the operation of the CPU **410**, and provides the reference clock for timer counter **414**. The oscillator **414** is controlled by a crystal, not shown in the diagram. Assigned transmission slot and channel identification information and pager addresses are stored in code plug **422**, which is a programmable read only memory, such as an electrically erasable programmable read only memory (EPROM). In addition, the SSID information and NRI information is also stored in the code plug **422**. The RAM **416** is used to store code plug information when the receiver **400** is initially turned on, and to store messages as they are received. ROM **418** contains the firmware which controls the microcomputer operation. The firmware includes such programs as for controlling the decoding of transmission slot identify information, channel identification information, receiver address, receiver scanning frequency lists, NRI information, SSID information, and other receiver functions. Alert generator **420** generates an audible alert signal upon reception of a message.

When the receiver **400** is initially turned on, microcomputer **408** functions as a synchronization means, enabling the receiver **400** to synchronize the assigned transmission slot, after the receiver detects information in frame **0** and synchronizes to the transmitted signal. Microcomputer **408** also functions as the decoder for decoding channel identification information, SSID information and NRI information. Microcomputer **408**, in conjunction with frequency synthesizer **424**, functions as a channel selecting means **426** used to control the scanning of the receiver **400**. Microcomputer **408**, in conjunction with power switch **428**, provides a battery saving function for the receiver **400**.

FIG. **18** illustrates an example of a transmitter station **500** useful in accordance with the present invention. Transmitter station **500** comprises a paging terminal **502** used to enter messages originated in a home or local area with respect to a receiver, as indicated at **504**, or the messages are for receiver that is roaming outside its local area, as indicated at **506**. Messages for a roaming receiver which are originated outside of the coverage area home or local area of a receiver are conveyed to the paging terminal **502** by a hardware interconnect with a paging terminal in the home or local area, such as a dial-up or hardwired phone line, or by means of an RF signal, such as a satellite receiver.

Messages entered into paging terminal **502** are processed for transmission into the signaling format or protocol described above, and in the aforementioned patent, or another suitable signaling protocol. The messages are placed in queues corresponding to the frame to which a receiver is assigned. The output of the paging terminal is coupled to an RF transmitter **508** for transmission via an antenna **510**. It is appreciated that the paging terminal **502** optionally controls more than one transmitter, as in a wide area simulcast system, and synchronization of multiple transmitters in a simulcast system is provided. Various methods for synchronizing the transmitters are available, such as described in U.S. Pat. No. 4,718,109 to Bremen et al.

Furthermore, in order to provide for global synchronization of transmitters to frame **0** as described above, a synchronization module **512** is coupled to the paging terminal **502**. The synchronization module comprises a global position system (GPS) receiver **514** and a timing module **516**, which together enable the paging terminal **502** to determine an accurate occurrence of frame **0**. Instead of a GPS receiver **514**, another time standard signal is monitored by suitable monitoring devices.

It should be understood that although the invention has been described in connection with a particular signaling protocol, the invention is useful in connection with any synchronous signaling protocol.

The above description is intended by way of example only and is not intended to limit the present invention in any way except as set forth in the following claims.

What is claimed is:

1. A method for selectively communicating group messages to pagers in a network, the method comprising the steps of:

dividing a network into a plurality of service areas, each service area comprising at least one zone;

assigning to each network a network roaming identifier which comprises at least a network identifier and a service area identifier such that the network identifier is common throughout a network, the service area identifier for identifying a service area within a network;

assigning to each service area at least one system identifier which comprises at least a local service provider identifier and a zone identifier for identifying a zone within a service area;

storing in at least one receiver subscribed for receiving messages in a particular network and in at least one home service area in the particular network, a network roaming identifier associated with the particular network and at least one particular system identifier associated with the at least one home service area;

generating a group message to be decoded by a select group of receivers subscribed to receive messages in the particular network;

generating a signal associated with each zone for communicating addressed messages to receivers in each zone, including a step of associating within the signal the group message with the network roaming identifier corresponding to a network, the signal further including a system identifier corresponding to each zone;

transmitting in each zone the signal associated with each zone;

in the at least one receiver, receiving the signal transmitted in a zone and decoding the system identifier corresponding to the at least one home service area and ignoring the network roaming identifier so as not to receive the group message associated with the network roaming information, and when the at least one receiver determines that the decoded system identifier does not correspond to the stored particular system identifier, decoding the network roaming identifier and the group message associated therewith.

2. The method of claim **1**, wherein the network roaming identifier is transmitted in at first and second occurences within a time frame, the second occurrence of the network roaming identifier having the group message associated therewith.

3. The method of claim **2**, wherein the time frame comprises an address field and a message field, and wherein the network roaming identifier transmitted in the first occurrence is in the address field, and wherein the network identifier transmitted in the second occurrence is in the address field, and the group message associated with the network identifier is located in the message field.

4. The method of claim **3**, wherein the step of transmitting comprises transmitting the signal in successive cycles, each cycle comprising a plurality of consecutive time frames, each time frame comprising at least a sync word, an address field, and a message field, and wherein the network roaming identifier is contained in the address field of the sync word, and wherein the system identifier is contained in the sync word.

5. The method of claim **4**, wherein the network identifier corresponding to the network roaming identifier is in the address field, and the Service Area identifier corresponding to the network roaming identifier is in the message field.

6. The method of claim **1**, and wherein the step of generating the group message comprises generating a network message which is designated for reception throughout a network, and wherein the step of associating the group message comprises associating the network message with a network identifier of a network roaming identifier such that the network message is designated for reception throughout a network corresponding to a network identifier.

7. The method of claim **1**, wherein the step of generating the group message comprises generating a service area message designated for reception throughout a service area, and the step of associating comprises associating the service area message with an entire network roaming identifier such that the network message is designated for reception throughout a service area corresponding to a network roaming identifier.

8. A selective call receiver comprising:

a receiver circuit for receiving a transmitted signal and generating output signals, the transmitted signal including a network roaming identifier associated with a network in which the transmitted signal is transmitted and a system identifier associated with the service area in which the signal is transmitted;

a control circuit coupled to the receiver circuit and responsive to the output signals of receiver, the control circuit comprising a memory for storing a particular network roaming identifier associated with at least one particular network in which the selective call receiver is subscribed to receive messages and a system identifier associated with at least one particular service area in which the selective call receiver is subscibed to receive messages, a processor circuit for decoding the output signals from the receiver circuit in accordance with a control program, the processor circuit being programmed by the control program for:

decoding the system identifier in the transmitted signal;

determining whether the system identifier in the transmitted signal matches the particular system identifier stored in the memory;

ignoring the network roaming identifier in the transmitted signal and any group message associated with the network roaming identifier in the transmitted signal when the system identifier in the transmitted signal matches the particular system identifier; and

otherwise decoding the network roaming identifier in the transmitted signal and the group message associated therewith.

9. A method for communicating messages to a plurality of addressable receivers subscribed to receive messages in a network which comprises multiple service areas, comprising steps of:

assigning to each network a network roaming identifier which comprises at least a network identifier and a service area identifier such that the network identifier is common throughout a network;

generating a signal for transmission in a service area of the network, the signal comprising a plurality of frames for consecutive transmission such that the plurality of frames define a cycle, each frame comprising substantially in sequence, synchronization information, a block information field comprising a plurality of block information words, an address field comprising a plurality of address information, a vector field comprising a plurality of vector information, and a message field comprising a plurality of messages associated with address information and corresponding vector information;

encoding in the address field of a particular frame in a cycle, a particular network identifier which includes an address word for an addressable receiver;

encoding in the vector field of the particular frame, in association with the particular network identifier at least the service area identifier, which together with the particular network identifier comprise a network roaming identifier code word;

encoding in the address field of the particular frame, a shortened network roaming identifier code word comprising the particular network identifier, in order to indicate that a network system message is being transmitted;

encoding a network system message in the message field in association with the shortened network roaming identifier code word; and

transmitting the signal in the service area of the network.

10. A selective call receiver comprising:

a receiver circuit for receiving a transmitted signal and generating output signals, the transmitted signal comprising a plurality of frames consecutively transmitted such that the plurality of frames define a cycle, each frame comprising substantially in sequence, synchronization information, a block information field comprising a plurality of block information words, an address field comprising a plurality of address information, a vector field comprising a plurality of vector information, and a message field comprising a plurality of messages associated with address information and corresponding vector information;

a control circuit coupled to the receiver circuit and responsive to the output signals of the receiver circuit, the control circuit comprising a memory for storing a particular network roaming identifier associated with at least one particular network in which the selective call receiver is subscribed to receive messages and a system identifier associated with at least one particular service area in which the selective call receiver is subscribed to receive messages, a processor circuit for decoding the output signals of the receiver circuit in accordance with a control program, the processor circuit being programmed by the control program for:

decoding from the address field of a particular frame in a cycle, a network identifier which an address word for an addressable receiver;

decoding from the vector field of the particular frame, in association with the network identifier at least a service area identifier, which together with the network identifier comprise a network roaming address word;

decoding from the address field of the particular frame, a shortened network roaming identifier code word comprising the network identifier, which indicates that a network system message is being transmitted; and

decoding the network system message from the message field in association with the shortened network roaming address word.

11. A method for communicating messages to a plurality of addressable receivers subscribed to receive messages in a network which comprises multiple service areas, comprising steps of:

dividing a network into a plurality of service areas, each service area comprising at least one zone;

assigning to each service area at least one system identifier which comprises at least a service provider identifier and a zone identifier for identifying a zone within a service area;

generating a signal for transmission in a service area of the network, the signal comprising a plurality of frames for consecutive transmission such that the plurality of frames define a cycle, each frame comprising substantially in sequence, synchronization information, a block information field comprising a plurality of block information words, an address field comprising a plurality of address information, a vector field comprising a plurality of vector information, and a message field comprising a plurality of messages associated with address information and corresponding vector information;

encoding into two of the block information words, a first service area identifier word comprising a local system identifier and zone identifier, and a second service area identifier word comprising traffic splitting flags and country codes;

encoding into another of the block information words system message information indicating a system message type;

encoding addresses for receivers in the address field;

encoding vector information in the vector field;

encoding system message vector in the first location of the message field; and

encoding in the message field a system message in association with the system message vector.

12. A selective call receiver comprising:

a receiver circuit for receiving a transmitted signal and generating output signals, the transmitted signal comprising a plurality of frames consecutively transmitted such that the plurality of frames define a cycle, each frame comprising substantially in sequence, synchronization information, a block information field comprising a plurality of block information words, an address field comprising a plurality of address information, a vector field comprising a plurality of vector information, and a message field comprising a plurality of messages associated with address information and corresponding vector information;

a control circuit coupled to the receiver circuit and responsive to the output signals of the receiver circuit, the control circuit comprising a memory for storing a particular service area identifier associated with at least one particular service area in which the selective call receiver is subscribed to receive messages, and a processor circuit for decoding the output signals of the receiver circuit in accordance with a control program, the processor circuit being programmed by the control program for:

decoding two of the block information words that include a first service are identifier word comprising a local system identifier and zone identifier, and a second service area identifier word comprising traffic splitting flags and country codes;

decoding another of the block information words that includes system message information indicating a system message type;

determining whether the system message type corresponds to a pertinent system message for the selective call receiver;

decoding a system message vector from the first location in the message field; and

decoding a system message associated with the system message vector from the message field.

* * * * *

GP - 2735

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

DOCKET NUMBER: PF01297NA

APPLICANTS: **Briancon et al.** EXAMINER: **J. Jeanglaude**

SERIAL NO.: **08/822,024** GROUP: **2735**

FILED: **March 24, 1997**

ENTITLED: **GEOGRAPHIC-TEMPORAL SIGNIFICANT MESSAGING**

Certificate of Mailing

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231 on

9-8-98

Date

Stephanie L. Taylor

Stephanie L. Taylor

PETITION FOR A ONE MONTH EXTENSION OF TIME UNDER 37 C.F.R. § 1.136(a)

Box: Fee Amendment
Assistant Commissioner
for Patents
Washington, D.C. 20231

Sir:

Applicant hereby petitions pursuant to 37 C.F.R. §1.136(a) for a one month extension of time for response to the outstanding Official Action mailed May 8, 1998. The period for response was previously set to elapse August 8, 1998, and is accordingly hereby extended to September 8, 1998, which is still within the six-month statutory period for response (35 U.S.C. § 133) which elapses November 8, 1998.

The reason for this petition is as follows:

X	A response to the outstanding Official Action is being filed herewith;
	It is expected that a response to the outstanding Official Action will be filed within the extended period for response;
	A Notice of Appeal to the Board of Appeals (37 CFR § 1.191) is being filed herewith;
	It is expected that a Notice of Appeal to the Board of Appeals (37 CFR § 1.191) will be filed within the extended period for response.
	A Division, Continuation, or Continuation-in-part is being filed, and it is desired to maintain the present application in pending condition pursuant to 35 USC § 120 through at least the filing date of the Division, Continuation, or Continuation-in-part application.

The required fee as established by 37 CFR § 1.17(a), (b), (c) or (d) pursuant to 35 U.S.C. § 41(a) (8) is:

		RATE	FEE
XX	First Month	$110.00	$110.00
	Second Month	$400.00	
	Third Month	$950.00	
	Fourth Month	$1,510.00	

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The above fee is to be charged to our Deposit Account No. 50-0280. Please charge any additional fees or credit overpayment to Deposit Account No. 50-0280.

Respectfully submitted,
Briancon et al.

By Charles W. Bethards

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

DOCKET NUMBER: PF01297NA

APPLICANTS: **Briancon et al.** EXAMINER: **J. Jeanglaude**

SERIAL NO.: **08/822,024** GROUP: **2735**

FILED: **March 24, 1997**

ENTITLED: **GEOGRAPHIC-TEMPORAL SIGNIFICANT MESSAGING**

AMENDMENT UNDER 37 CFR 1.115

Box:
Assistant Commissioner
for Patents
Washington, D.C. 20231

Sir:

Responsive to the Office Action dated **May 8, 1998**, regarding the above-identified subject matter, the applicant hereby respectfully submits the following amendment and response.

Comments and Response

1. Applicant was duly advised by the Examiner in the above referenced **May 8, 1998** office action that:

a) Claims 1-3 are rejected under 35 U.S.C 103(a) as being unpatentable over DeLuca 986 in view of DeLuca et al. 826.

b) Claims 6, 8, 10-15, 17, 18, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeLuca et al. 826 in view of DeLuca 986.

c) Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeLuca et al. 826 in view of DeLuca 986 as applied to claim 6.

d) Claims 16 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeLuca et al. 826 in view of DeLuca 986 as applied to claims 11 and 17 above, and in further view of Willard et al. (U.S. Patent Number 5,600,312).

e) Claims 4, 5, 9 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant notes the objections to claims 4, 5, 9, and 19 and wishes to reserve the opportunity to rewrite such claims should further discussions of the rejected base claims prove unsuccessful. Applicant respectfully requests that the examiner reconsider the rejected claims in view of the comments below.

Applicant's invention arises in the selective calling field and makes use of the observation that certain messages have utility when received at or near particular geographic locations or spaces - that is these messages are spatially sensitive or spatially relevant. Applicant's invention is defined in varying scope by claims 1-21, including independent claims 1, 6, 11, and 17. In representative form claim 1 recites a method of processing spatially sensitive information at a selective call receiver. The method includes: receiving the spatially sensitive information along with an associated identifier; storing the spatially sensitive information if the associated identifier is valid; detecting a change in the associated identifier as the selective call receiver roams from a first area to a second area; and processing the spatially sensitive information.

The examiner cites DeLuca 986 in combination with DeLuca et al. 826 (or vice a versa) as teaching or suggesting claims 1-3, 6, 7, 8, 10 - 15, 17, 18, 20. Claims 16 and 21 are rejected with reliance on this combination together with Willard et al. Applicant respectfully disagrees. DeLuca 986 discusses a paging or selective call system that is arranged to provide service over a wide area while maintaining reasonable message latencies or message queue lengths. This is accomplished by including a location ID in a predetermined paging channel (FIG.3, 301). The pager scans for an active channel, decodes this location ID col. 3 lines 27 - 32, and automatically switches to the local address, frequency, etc. as found in the code plug corresponding to this location ID (FIG. 4). When the local signal is no longer present the pager switches back to the nation wide frequency and personality, col 3, lines 32-36. DeLuca et al. 826 describes a paging system wherein messages or pages are received along with one or more "status information" signals. These status information signals provide the pager with information regarding how to "process" the associated messages ordinarily as a function of time.

DeLuca 986 does not describe or contemplate or suggest receiving spatially sensitive information along with an associated identifier as specifically required by claim 1 or as analogously required by independent claims 6, 11, 17. This reference merely describes receiving a location ID. This location ID directs a pager that finds a match to this ID within its memory to a channel where messages, if any, for that pager will be found. The location ID of DeLuca 986 is not associated with the spatially sensitive information or relevancy status as clearly contemplated by the claimed invention.

Further neither of the cited references teaches or suggests storing, conditioned on validity of an associated identifier or relevancy status (location ID or status information), spatially sensitive information or messages, respectively. DeLuca et al. 826 merely speaks of storing rather than conditionally storing messages. Further the references do not detect a change in the associated identifier as contemplated by the claimed invention. DeLuca 986 does or may detect a different location ID if such is available as the pager roams from one area to another but this ID is not associated with a message and a change is not detected. Rather if one local signal with one location ID is lost and subsequently another found with another ID the pager will again be directed to receive in accordance with the latest location ID.

For these reasons applicant respectfully urges that independent claims 1, 6, 11, and 17 have not been contemplated, taught, or suggested by DeLuca 986 or DeLuca et al. 826, either taken singularly or in combination. For the same reasons the dependent claims 2 - 5, 7 - 10, 12 - 16, and 18 - 21 have not been contemplated, taught or suggested by the cited references. Thus applicant respectfully requests that the examiner reconsider and withdraw the above noted rejections under 35 U.S.C. §103(a) based on these references and move claims 1 - 21 to allowance.

Accordingly, applicant respectfully submits that the claims clearly and patentably distinguish over the cited reference of record and as such are to be deemed allowable. Such allowance is hereby earnestly and respectfully solicited at an early date. Applicant welcomes questions or suggestions at the phone number listed below.

The Commissioner is hereby authorized to charge any fees which may be required to Deposit Account No. **50-0280**.

Respectfully submitted,
Briancon et al.

Please send correspondence to:

By Charles W. Bethards

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

DOCKET NUMBER: **PF01297NA**

APPLICANTS: **Briancon et al.** EXAMINER: **J. Jeanglaude**

SERIAL NO.: **08/822,024** GROUP: **2735**

FILED: **March 24, 1997**

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Box: Fee Amendment
Assistant Commissioner
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Washington, D.C. 20231

Sir:

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(1) Transmittal Letter to PTO;
(2) Request for One Month Extension of Time;
(3) Amendment;
(4) Certificate of Mailing; and
(5) Return postcard.

Any fee associated with this correspondence is to be charged to 50-0280.

Respectfully submitted,
Briancon et al.

By Charles W. Bethards

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Tuesday, November 17, 1998

Official

To: Jean Jeanglaude
Company: Patent and Trademark Office

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Number of Pages: 3

Regarding Serial No.: **08/822,024**

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Kristi Green

Kristi Green

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Official

AMENDMENT UNDER 37 CFR 1.115

Box:
Assistant Commissioner
for Patents
Washington, D.C. 20231

Sir:

Per a teleconference with Examiner Jean Jeanglaude on November 17, 1998, regarding the above-identified subject matter, the applicant hereby respectfully submits the following amendment:

Please cancel claim 9 and amend claim 6 as indicated.

6. (Once Amended) A method of processing a message among a plurality of messages received over the air at a selective call receiver, comprising the steps of:

receiving the plurality of messages, at least a portion of the messages being received with a relevancy status that includes a space/time indicator;

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