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IDENTIFYING MESSAGE CATEGORIES OF INFORMATION SERVICE MESSAGES

FIELD OF THE INVENTION

This invention relates to identifying message categories of information service messages. The invention is particularly suitable for, but not necessarily limited to, a selective call receiver and associated systems and methods of operation in which message numbering bits can be used conventionally. Alternatively, the message numbering bits can be used for identifying an address location of the selective call receiver where a message should be stored.

BACKGROUND ART

Portable communication devices are becoming widely accepted as a form of communication. One type of communication device is known as a selective call receiver, often referred to as a pager, which receives paged information transmitted from one or more transmitters in a system. In this specification, selective call receivers will be used by way of example, however the invention is not necessarily limited to selective call receivers. Such selective call receivers are usually carried by users for receiving paged messages when they are away from their office or home telephone.

One feature that selective call receivers and systems can offer is message numbering in which transmitted messages to a specific selective call receiver are sequentially numbered. Accordingly, each received personal message is allocated a number that identifies the sequence in which it was received in relation to other received messages. Message numbering as described is available, for example, in the FLEX™

protocol and will be apparent to a person skilled in the art.

Another feature that may be provided by selective call receivers and systems is commonly known as mail drop messages or information service messages. This feature allows information service providers to transmit message categories such as financial information, weather reports, local news, international news, sports updates and the like. Each message category is stored in a specific area of memory in a particular selective call receiver so that by operation of function keys a user can access any one of the message categories that he subscribes to. In the remainder of this specification a personal message means a message which is a message other than a mail drop or information service message and may include a message to an individual selective call receiver or a message to a selected group of such receivers.

Information service messages may require unnecessary large amounts of memory allocated to store addresses for identifying message categories. In order to reduce the number of addresses required for identifying message categories, sub-addresses may be used. However, the use of sub-addresses is not always practical and may not be available for certain messaging protocols.

SUMMARY OF THE INVENTION

It is an aim of the invention to overcome or alleviate at least one of the problems associated with identifying message categories of information service messages.

According to one aspect of the invention there is provided a communication device comprising:

receiver means for receiving at least one transmitted coded message, said message having a plurality of message numbering bits associated therewith;

processing means, in communication with said receiver means, for processing said message; and

memory means for storing said message, said memory means being coupled to said processing means,

wherein said processing means is adapted to process said message to determine if it is a sequentially numbered message containing message numbering in said message numbering bits or an information service message, and wherein if said message is an information service message said processing means is adapted to store said message in said memory means at an address associated with information in said message numbering bits.

Preferably, said communication device may be a selective call receiver.

Suitably, said memory means can be a non-volatile memory.

Preferably, said processing means may be adapted to process a bit flag in said message to determine if said message is a said sequentially numbered message or a said information service message.

Suitably, said communication device may be characterised by said information service message being a mail drop message.

According to another aspect of this invention there is provided a communication system including:

at least one control unit for receiving and processing messages to provide coded messages having a plurality of message numbering bits associated therewith;

at least one transmitter for transmitting said coded messages, said transmitter being coupled to said control unit; and

a plurality of communication devices, each of said devices comprising:

receiver means for receiving at least one of said coded messages;

processing means, in communication with said receiver means, for processing said messages; and

memory means for storing said messages, said memory means being coupled to said processing means,

wherein said processing means is adapted to process each of said received messages to determine if they are a sequentially numbered message containing message numbering in said message numbering bits or an information service message, and wherein if said message is an information service message said processing means is adapted to store said message in said memory means at an address associated with information in said message numbering bits.

Preferably, said communication device may be a selective call receiver.

Suitably, said memory means can be a non-volatile memory.

Preferably, said processing means may be adapted to process a bit flag in said message to determine if said

message is a said sequentially numbered message or a said information service message.

Suitably, said communication device may be characterised by said information service message being a mail drop message.

According to another aspect of this invention, there is provided a method for identifying message categories of information service messages, the method comprising the steps of:

receiving a coded message having a plurality of message number bits;

processing said message to determine if it is a sequentially numbered message containing message numbering in said message numbering bits or an information service message; and

storing said message, wherein if said processing determines that said message is an information service message said message is stored at a memory address associated with information in said message numbering bits.

Suitably, said processing step may include a step of testing a status of a flag for identifying if said message is a said information service message.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be readily understood and put into practical effect, reference will now be made to a preferred embodiment as illustrated with reference to the accompanying drawings in which:

FIG. 1 is a block diagram of a selective call receiver in accordance with an embodiment of an invention;

FIG. 2 illustrates a selective call receiver system including a number of selective call receivers of Fig. 1; and

FIG. 3 illustrates a flow diagram of the operation of the selective call receiver system of FIG. 2.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

With reference to Fig. 1 there is illustrated a communication device in the form of a selective call receiver 1 commonly known as a pager. Selective call receiver 1 comprises a receiver means 2 coupled to be in communication with a processing means 3. Processing means 3 includes a channel control means in the form of a frequency synthesiser 4 coupled to be controllable by a micro-processor 13. However, the frequency synthesiser 4 can be arranged to be external to processing means 3. Further, an alert generator 17 is coupled to be controllable by micro-processor 13 and a display in the form of a Liquid crystal display (LCD) 5 and user actuatable function switches 6 are coupled to be in communication with micro-processor 13.

In this preferred embodiment receiver means 2 includes a receiver 8 coupled to an antenna 7 by a radio frequency amplifier 9.

The processing means 3 also includes a demodulator 10 coupled to both receiver 8 and a decoder 11. The

decoder 11 is coupled to micro-processor 13 and has an associated Read Only Memory (ROM) 12 that stores data for decoding received messages. Micro-processor 13 is also coupled a Random Access Memory (RAM) 14, a Read Only Memory (ROM) 15 and a non-volatile code plug memory 20. Further, liquid crystal display 5 has an associated slave driver 16 controllable by micro-processor 13.

As will be apparent to a person skilled in the art, alert generator 17 comprises an addressable tone generator addressable by micro-processor 13. Outputs of tone generator 17 are coupled to drive either or both a speaker and a transducer in the form of a vibrator motor for vibrating a casing of selective call receiver 1.

The Read Only Memory 15 has stored data for converting decoded received binary messages into characters for displaying on liquid crystal display 5. In this embodiment Read Only Memory 15 also has stored operating code for micro-processor 13, whereas Random Access Memory 14 is for storing received decoded paged messages and is also used for storing temporary data as will be apparent to a person skilled in the art. Further, code plug 20 stores channel information including channel frequencies and information concerning system identifiers such as Simulcast System Identifiers (SSID) or Network Identifiers (NID) as defined in the Flex™ protocol. Code plug 20 also stores address information and address information as to where specific message categories of information service messages are to be stored.

Referring to FIG. 2 there is illustrated a selective call receiver system 30 comprising a service provider control unit 33 coupled to a transmitter 34 which can transmit messages to one or more selective call receivers 1 that are in transmission range. Control unit 33 is

also coupled to a telephone network 31 to receive personal messages and a news service network 32 to receive information service messages. However, it will be apparent to a person skilled in the art that information service messages can be received through telephone network 31. Further, the hardware associated with control unit 33 will also be apparent to a person skilled in the art and therefore needs no discussion.

Referring to FIG. 3 there is illustrated a flow diagram of the operation of the selective call receiver system 30. At step 40 a message is by received control unit 33 from either telephone network 31 or news service network 32. The control terminal processes and formats the message into a coded message, for instance the message can be coded into the Flex™ protocol. If the message is a personal message a Mail Drop Flag MDF of the coded message will be unset (logic zero) and a Message Number Field MNF Comprising six message number bits) of the protocol will be incremented in a conventional manner. However, if the message is a mail drop (information service message) the Mail Drop Flag MDF of the coded message will be set (logic 1) and the Message Number Field MNF will store an address associated with a memory slot for the message when it is received by a subscribing selective call receiver 1.

The coded message when formatted as describe above is then transmitted at step 41 by transmitter 34. One or more addressed selective call receivers 1 receive the transmitted message at step 42. The addressed selective call receivers 1 receive the message at their receiver means 2. The message is then processed by processing means 3 and includes a test step 43 which checks the status of the Mail Drop Flag MDF. If at test step 43 the Mail Drop Flag is unset (logic 0) the step 45 is effected and the received message is stored in Random Access

Memory 14 as a conventional sequentially numbered message in which an associated number identified by information in the Message Number Field MNF.

If at test step 43 the Mail Drop Flag MDF is set (logic 1) then the message is deemed to be a mail drop message and step 44 is effected. At step 44 the message is treated as an information service message (mail drop message) in which the message is stored at an address associated with the information in the Message Number Field MNF. In summary, steps 43, 44 and 45 may be further described with reference to the following pseudo-code subroutine that is coded and stored in ROM 15.

```
{pseudo-code subroutine start}
begin
if Mail Drop Flag MDF = 0 then
 process the message as normal message;
 allocate the message with a sequential number
 associated with information contained in the Message
 Number Field MNF;
      {sequential number is 1 to 64}
 Store the message in a conventional numbered manner;

else if Mail Drop Flag MDF = 1 then
 use the Message Number Field MNF information as
 designated mail drop source number;
 store the message in the source slot indicated by
 the Message Number Field MNF;
 end if
end.
 {pseudo-code subroutine end}
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Once the message has been stored as a sequentially numbered message or an information service message it can be viewed on liquid crystal display 5 by operation of switches 6.

Advantageously, the present invention uses the Message Number Field MNF in a conventional manner to sequentially allocate numbers to personal messages or alternatively identify a category of an information service message. Accordingly, the present invention alleviates or overcomes the problem of unnecessary large amounts of memory that may have to be allocated for storing addresses identifying message categories. The invention also offers an alternative to using sub-addressing for identifying specific information service messages.

Although the invention has been described with reference to a preferred embodiment it is to be understood that the invention is not restricted to the particular embodiment described herein. For instance, protocols other than the Flex™ protocol may be used.

WE CLAIM:

1. A communication device comprising:

receiver means for receiving at least one transmitted coded message, said message having a plurality of message numbering bits associated therewith;

processing means, in communication with said receiver means, for processing said message; and

memory means for storing said message, said memory means being coupled to said processing means,

wherein said processing means is adapted to process said message to determine if it is a sequentially numbered message containing message numbering in said message numbering bits or an information service message, and wherein if said message is an information service message said processing means is adapted to store said message in said memory means at an address associated with information in said message numbering bits.

2. A communication device as claimed in claim 1, wherein said communication device is a selective call receiver.

3. A communication device as claimed in claim 1 or claim 2, wherein said memory means is a non-volatile memory.

4. A communication device as claimed in any preceding claim, wherein said processing means is adapted to process a bit flag in said message to determine if said message is a said sequentially numbered message or a said information service message.

5. A communication system including:

at least one control unit for receiving and processing messages to provide coded messages having a plurality of message numbering bits associated therewith;

at least one transmitter for transmitting said coded messages, said transmitter being coupled to said control unit; and

a plurality of communication devices, each of said devices comprising:

receiver means for receiving at least one of said coded messages;

processing means, in communication with said receiver means, for processing said messages; and

memory means for storing said messages, said memory means being coupled to said processing means,

wherein said processing means is adapted to process each of said received messages to determine if they are a sequentially numbered message containing message numbering in said message numbering bits or an information service message, and wherein if said message is an information service message said processing means is adapted to store said message in said memory means at an address associated with information in said message numbering bits.

6. A communication system as claimed in claim 5, wherein said communication device is a selective call receiver.

7. A communication system as claimed in claim 5 or claim 6, wherein said memory means is a non-volatile memory.

8. A communication system as claimed in any one of claims 5 to 7, wherein said processing means is adapted to process a bit flag in said message to determine if said message is a said sequentially numbered message or a said information service message.

9. A method for identifying message categories of information service messages, the method comprising the steps of:

receiving a coded message having a plurality of message number bits;

processing said message to determine if it is a sequentially numbered message containing message numbering in said message numbering bits or an information service message; and

storing said message, wherein if said processing determines that said message is an information service message said message is stored at a memory address associated with information in said message numbering bits.

10. A method for identifying message categories as claimed in claim 9, wherein said processing step includes a step of testing a status of a flag for identifying if said message is a said information service message.

11. A communication device substantially as described herein with reference to and as illustrated by the accompanying drawings.

12. A communication system substantially as described herein with reference to and as illustrated by the accompanying drawings.

13. A method for identifying message categories substantially as described herein with reference to and as illustrated by the accompanying drawings.