US 20040117859A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2004/0117859 A1

Ohel (43) Pub. Date: Jun. 17, 2004

(54) MULTIPLE CHANNEL DATA RECORDER AND METHOD FOR RECORDING DATA ON MULTIPLE CHANNELS

(76) Inventor: **Hagai Ohel**, Coconut Creek, FL (US)

Correspondence Address:
LERNER AND GREENBERG, P.A.
POST OFFICE BOX 2480
HOLLYWOOD, FL 33022-2480 (US)

(21) Appl. No.: **10/320,948**

(22) Filed: **Dec. 16, 2002**

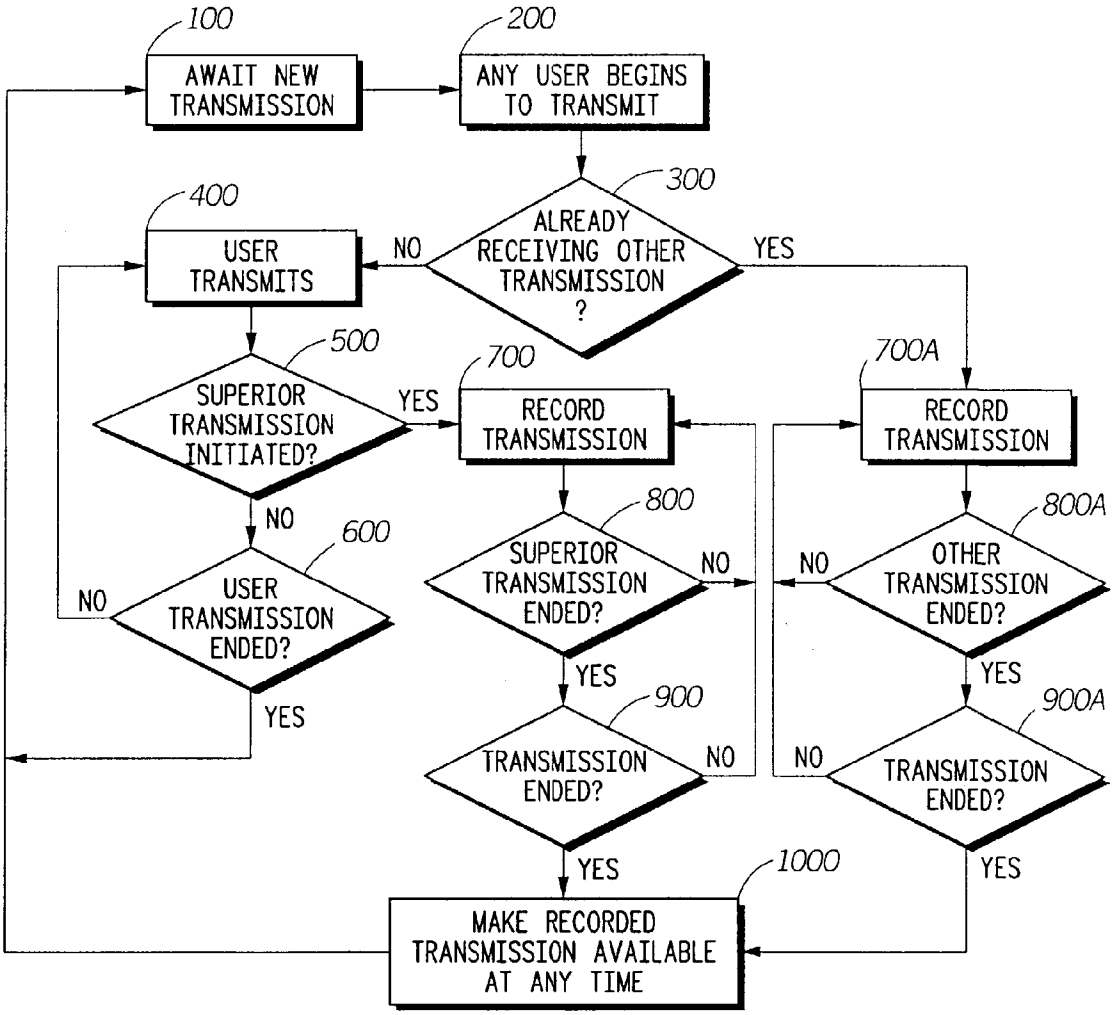
Publication Classification

(51) **Int. Cl.**[7] **H04N 7/16**; H04N 5/91; H04N 7/173; H04N 7/20; H04N 7/08

(52) **U.S. Cl.** **725/146**; 725/90; 725/62; 725/63; 725/118; 725/116

(57) **ABSTRACT**

A multiple channel data recorder and a method for recording data on multiple wireless communications channels includes a transceiver, a display, and a processor programmed to selectively record the user's transmission for playback by at least one of the user and another user and, if another new transmission starts to be received by the user during the user's transmission, to continue transmitting the user's transmission and to record the new transmission at least from a beginning of the new transmission for playback, or to stop transmitting the user's transmission and to start recording at least a remainder of the user's transmission at least from the beginning of the new transmission for playback, and to receive the new transmission by the user.



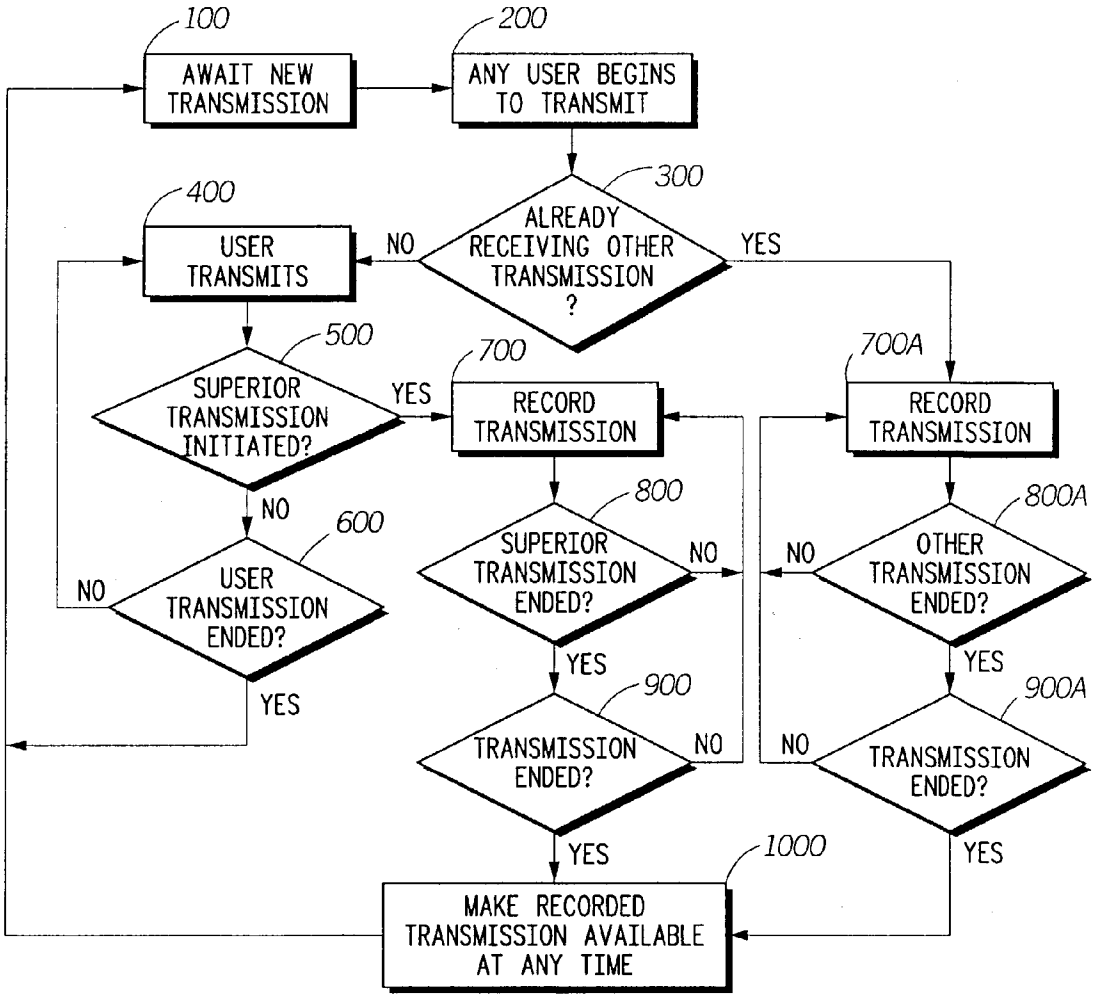


FIG. 1

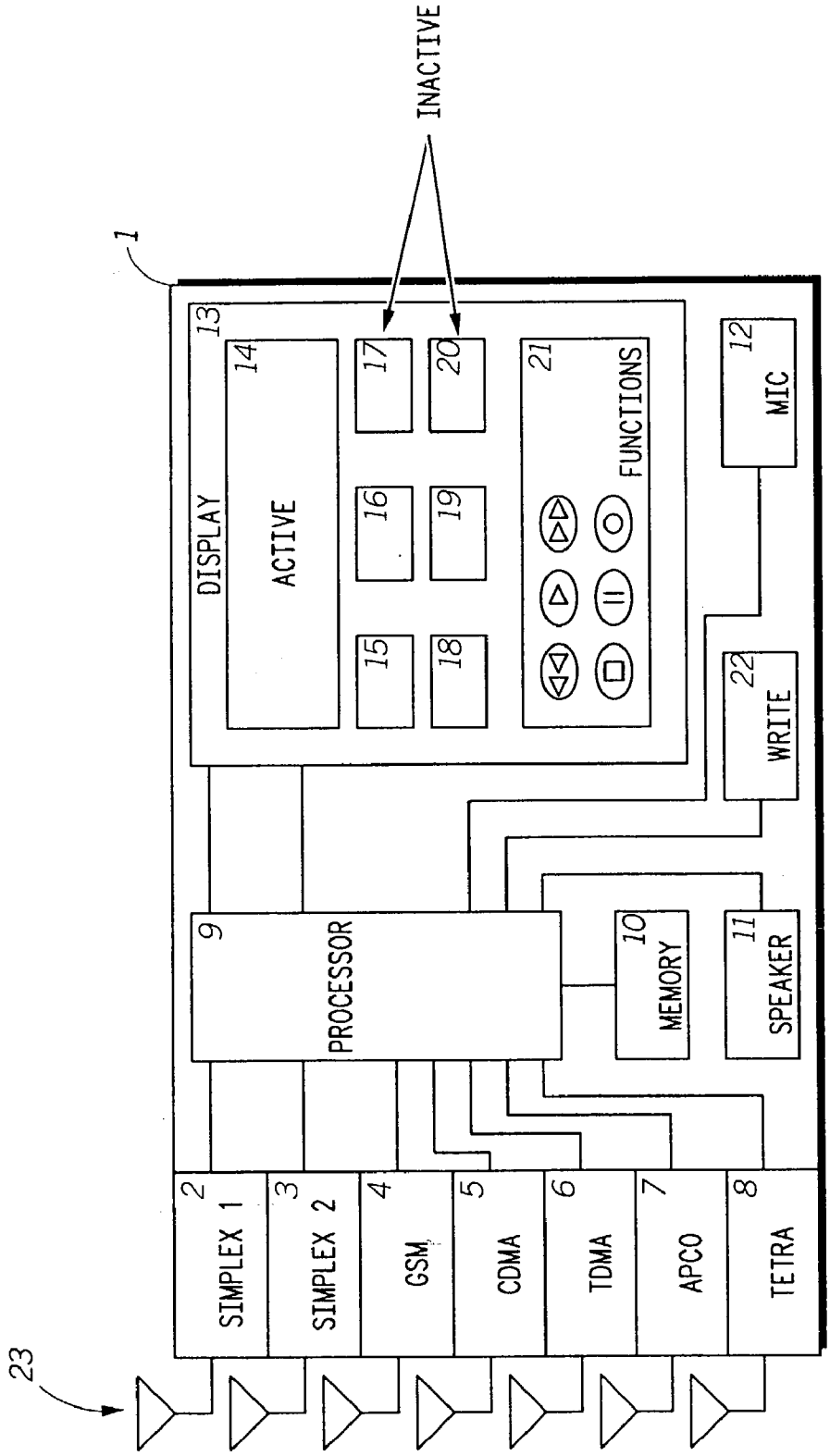


FIG. 2

MULTIPLE CHANNEL DATA RECORDER AND METHOD FOR RECORDING DATA ON MULTIPLE CHANNELS

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The invention lies in the field of electronic recording of data. The invention relates to a multiple channel data recorder and method for recording data on multiple channels.

[0003] 2. Description of the Related Art

[0004] Presently, multi-party communication, in particular, voice communication, typically occurs over a single communications channel. With such communication, a first party can talk to a second party and, while the first party remains talking, all other parties on that communication channel are muted until the first party finishes the message. This kind of communication is typical for walkie-talkie units, for example.

[0005] Alternatively, there can be a superior party that has the ability to talk over any first party currently talking on a multi-party channel. A common example of such communication exists with public safety communications such as police and fire/rescue. In an example where police are communicating with one another, when a first officer is talking over the dispatch channel, all other officers tuned into that channel can hear the first officer and cannot talk until the first officer completes the communication. However, if a police dispatcher begins talking, the first officer's transmission is cut off and the dispatcher's communication is transmitted over the dispatch channel instead of the first officer's transmission. This feature is referred to herein as overtalk. In some instances of overtalk, the first officer would not know that the dispatcher was talking until that officer's transmit button was released, which, then, would enable the audio reception speaker on that officer's unit and play the remaining portion of dispatcher's communication, if any. During such communication, the first officer's message, cut off by the dispatcher's interruption, is entirely lost. In other words, no part of the cut off message remains for anyone to listen to, whether concurrently or at a later time. It is also possible to lose communications data when the first officer's zeal for continuing communication in spite of the dispatcher's overtalk prevented the first officer from entirely hearing the dispatcher's message. Presently, multi-party communication systems are not able to capture any of these "lost" communications.

[0006] These kinds of multi-party communications exist with both mobile and portable communication devices. As set forth herein, a "mobile" communication device is one that is mounted in a moving object, such as a car or other vehicle, such as an ambulance, or even in a robot. In contrast, as set forth herein, a "portable" communication device is one that a single person can easily carry, such as a cell phone or walkie-talkie.

[0007] Various communications networks exist throughout the world, and these networks are standardized, but are not all compatible. For example, in the United States, public safety entities communicate through radio using the Association of Public Safety Communications Officials standard, also referred to as the APCO standard. Public safety entities of the European Union, for example, in comparison, communicate using the Terrestrial Trunked Radio standard, also referred to as the TETRA standard.

[0008] With respect to cellular communications, in the United States, principally the Code Division Multiple Access (CDMA), the Advanced Mobile Phone System (AMPS), and the Global System for Mobile Communication (GSM) standards are used. In comparison, the GSM standard is primarily used in the European Union and elsewhere.

SUMMARY OF THE INVENTION

[0009] Accordingly, the invention provides a multiple channel data recorder and method for recording data on multiple channels that overcome the hereinafore-mentioned disadvantages of the heretofore-known devices and methods of this general type and that prevent loss of communications during overtalk.

[0010] With the foregoing and other objects in view, there is provided, in accordance with the invention, a method for recording data on multiple wireless communications channels, including the steps of selectively recording the user's transmission for playback by at least one of the user and another user, and, if another new wireless transmission starts to be received by the user during the user's transmission, then performing one of continuing transmission of the user's transmission and recording the new wireless transmission at least from a beginning of the new wireless transmission for playback by at least one of the user and another user, and stopping transmission of the user's transmission and at least starting to record at least a remainder of the user's transmission at least from the beginning of the new wireless transmission for playback by at least one of the user and another user, and receiving the new wireless transmission by the user.

[0011] In accordance with another mode of the invention, the selective recording is carried out by determining, upon initiation of a user's wireless transmission, if another wireless transmission is being received already by the user and, if so, recording the user's transmission for playback by at least one of the user and another user, and, if not, beginning transmission of the user's transmission.

[0012] In accordance with a further mode of the invention, there is a determination, upon initiation of a user's wireless transmission on a given communications link, if another wireless transmission is being received already by the user on the same or a different communications link. The communications link can be a link including a communications channel and/or a communications network.

[0013] In accordance with an added mode of the invention, the continuing transmission step is carried out by continuing transmission of the user's transmission and simultaneously recording the new wireless transmission at least from a beginning of the new wireless transmission for playback by at least one of the user and another user.

[0014] In accordance with an additional mode of the invention, the stopping, starting, and receiving steps are carried out by immediately stopping transmission of the user's transmission and immediately starting to record at least a remainder of the user's transmission at least from the beginning of the new wireless transmission for playback by

at least one of the user and another user, and simultaneously immediately receiving the new wireless transmission by the user.

[0015] In accordance with yet another mode of the invention, at least one of the recording steps is carried out by digitally storing the recorded transmission in a memory. The recorded transmission can be stored in any format, including, but not limited to, mp3, wav, wma, real audio, quicktime, avi, mpeg, bmp, jpeg, gif, divx, and raw digital data, for example. The digital recording can be carried out by writing the digitally recorded transmission on an external writing media, which can include, for example, a hardware memory device or an external storage media. The recording can be carried out by storing the recorded transmission in a memory located at a place of origin of the transmission, at a place of reception of the transmission, or both.

[0016] In accordance with yet a further mode of the invention, the user's transmission and/or the new wireless transmission can be digital data, including, but not limited to code, an audio signal, an image, and a video stream.

[0017] In accordance with yet an added mode of the invention, at least one of the recorded transmissions is played back after the new wireless transmission and/or after the user's transmission has ended. Playback can begin from a starting point of a recorded transmission and/or from a user-selected point of time within a recorded transmission.

[0018] In accordance with yet an additional mode of the invention, a processor can be used to carry out the step of recording the user's transmission and can be used to for later transmission and/or playback by the user and/or another user.

[0019] In accordance with again another mode of the invention, a processor can be used to carry out the steps of stopping of the user's transmission and starting the recording of at least the remainder of the user's transmission at least from the beginning of the new wireless transmission for later transmission and/or playback the user and/or another user.

[0020] In accordance with again a further mode of the invention, at least one of the recording steps can be carried out by substantially eliminating dead air within the recorded transmissions.

[0021] In accordance with again an added mode of the invention, at least one of the recording steps can be carried out by compressing at least one of the recorded transmissions and dead air within the recorded transmissions.

[0022] With the objects of the invention in view, there is also provided a method for recording data on multiple wireless communications channels, including the steps of determining, upon initiation of a user's wireless transmission, if another wireless transmission is being received already by the user and, if so, recording the user's transmission for playback by at least one of the user and another user, and, if not, beginning transmission of the user's transmission and, if another new wireless transmission starts to be received by the user during the user's transmission, performing one of the steps of continuing transmission of the user's transmission and recording the new wireless transmission at least from a beginning of the new wireless transmission for playback by at least one of the user and another user and stopping transmission of the user's transmission and starting to record at least a remainder of the user's transmission at least from the beginning of the new wireless transmission for playback by at least one of the user and another user, and receiving the new wireless transmission by the user.

[0023] With the objects of the invention in view, there is also provided a method for recording data including at least one of a digital code, a digital audio signal, a digital image, and a digital video stream on multiple wireless communications channels, including the steps of determining, upon initiation of a user's wireless transmission, if another wireless transmission is being received already by the user and, if so, digitally recording the user's transmission in at least one memory for playback by at least one of the user and another user and, if not, beginning transmission of the user's transmission, and if another new wireless transmission starts to be received by the user during the user's transmission, performing one of the steps of continuing transmission of the user's transmission and simultaneously digitally recording the new wireless transmission at least from a beginning of the new wireless transmission in the at least one memory for playback by at least one of the user and another user and immediately stopping transmission of the user's transmission and immediately starting to digitally record at least a remainder of the user's transmission at least from the beginning of the new wireless transmission in the at least one memory for playback by at least one of the user and another user, and simultaneously immediately receiving the new wireless transmission by the user; and playing back at least one of the recorded transmissions after at least one of the new wireless transmission has ended and the user's transmission has ended.

[0024] With the objects of the invention in view, there is also provided a multiple channel data recorder, including at least one wireless communications transceiver, a display, and a processor connected to the at least one transceiver and to the display, the processor being programmed to selectively record the user's transmission for playback by at least one of the user and another user, and, if another new wireless transmission starts to be received by the user during the user's transmission, the processor being programmed to one of continue transmitting the user's transmission and record the new wireless transmission at least from a beginning of the new wireless transmission for playback by at least one of the user and another user and stop transmitting the user's transmission and start recording at least a remainder of the user's transmission at least from the beginning of the new wireless transmission for playback by at least one of the user and another user, and receive the new wireless transmission by the user.

[0025] In accordance with another feature of the invention, the processor is programmed to carry out the selective recording by determining, upon initiation of a user's wireless transmission, if another wireless transmission is being received already by the user and, if so, to record the user's transmission for playback by at least one of the user and another user and, if not, to begin transmitting the user's transmission through the at least one transceiver.

[0026] In accordance with a further feature of the invention, the processor is programmed to carry out the recording of a transmission with the processor for later transmission and/or playback by the user and/or another user.

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