

WIRELESS MULTITRACK RECORDING SYSTEM

BACKGROUND OF THE INVENTION

In the art of recording the use of wireless microphones is common. These
5 microphones are used to capture the audio content of a performance without the use of
wired microphones. This is common to television and film production.

It is common that this type of microphone system is not 100% reliable. Radio Frequency
interference as well as transmission issues can affect the quality and the reliability of the
10 audio recovered at the RF receiver.

To eliminate this problem a system of wireless microphones has been invented with the
ability to store the audio within the system. This system has the ability to be controlled in a
new and unique way.

15
Embodiments of the present invention generally relate to More specifically,
the present invention relates to

Many systems and methods have been created to

SUMMARY OF THE INVENTION

Other objects, features, and characteristics of the present invention, as well as the methods of operation and functions of the related elements of the structure, and the combination of parts and economies of manufacture, will become more apparent upon
5 consideration of the following detailed description with reference to the accompanying drawings, all of which form a part of this specification.

BRIEF DESCRIPTION OF THE DRAWINGS

10 A further understanding of the present invention can be obtained by reference to embodiments set forth in the illustrations of the accompanying drawings. Although the illustrated embodiments are merely exemplary of systems for carrying out the present invention, both the organization and method of operation of the invention, in general, together with further objectives and advantages thereof, may be more easily understood by
15 reference to the drawings and the following description. The drawings are not intended to limit the scope of this invention, which is set forth with particularity in the claims as appended or as subsequently amended, but merely to clarify and exemplify the invention.

For a more complete understanding of the present invention, reference is now made to the following drawings in which:

20 FIG. 1 depicts ...

FIG. 2 depicts a flowchart of the steps in a process recording audio data in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION

As required, a detailed illustrative embodiment of the present invention is disclosed herein. However, techniques, systems and operating structures in accordance with the present invention may be embodied in a wide variety of forms and modes, some of which
5 may be quite different from those in the disclosed embodiment. Consequently, the specific structural and functional details disclosed herein are merely representative, yet in that regard, they are deemed to afford the best embodiment for purposes of disclosure and to provide a basis for the claims herein, which define the scope of the present invention. The following presents a detailed description of one embodiment (as well as some alternative
10 embodiments) of the present invention.

Referring first to FIG. 1, depicted is recording system **100** in accordance with one embodiment of the present invention including local audio devices **102**, remote control unit **104**, receiver **106**, and audio recorder **108**. Remote control unit **104** is a radio frequency ("RF") transmitter capable of transmitting both a time reference signal and digital commands
15 to one or more of local audio devices **102**, receiver **106**, and audio recorder **108**. In one aspect of the present invention, the time reference signal is a Society of Motion Picture and Television Engineers ("SMPTE") time code signal containing information regarding the hour, minute, second, frame, type of time code (i.e., nondrop or drop frame), and **???? [GLENN-
WHAT TYPE OF USER DEFINABLE INFORMATION IS INCLUDED IN THIS SIGNAL??]**
20 This time reference signal provides a time reference for all local audio devices **102**, which use this information to synchronize their respective local clock **204**. Such synchronization ensures that all local audio devices **102** stamp all locally recorded audio with the same time reference as all other local audio devices **102**. The stamped time reference data is then

used during playback to ensure that the replayed audio from all local audio devices **102** is synchronized.

In the depicted embodiment of the present invention, both live and replayed audio transmitted by local audio devices **102** may be received at receiver **106** and recorded by audio recorder **108**. Receiver **106** receives the wireless RF signals generated by all active local audio devices **102** (e.g., modulated RF carrier signals) and converts the signals to a format capable of being recorded by a commercially available recording device that utilizes an SMPTE-compatible time code signal. Such formats include, but are not limited to...

[[GLENN-WHAT TYPE OF FORMATS??]] [[IS THERE SOMETHING UNIQUE ABOUT THIS CONVERSION FOR THIS INVENTION OR IS THIS RECEIVER A COMMERCIALY AVAILABLE DEVICE?]] After conversion to such a signal, audio may be recorded by recorder **108**, which may be any commercially available audio recorder.

[[GLENN-IS THIS THE FIRST WIRELESS MICROPHONE TO HAVE LOCAL RECORDING CAPABILITY? IF YES, WE SHOULD ADD CIRCUIT DIAGRAMS OR MORE DETAILED TECHNICAL INFORMATION RE HOW THE RX-900 IS ABLE TO RECORD LOCALLY – IF WE DO NOT, YOU CANNOT CLAIM PATENT PROTECTION FOR THIS – SO FAR WE ARE ONLY COVERING THE METHOD OF USING LOCAL AUDIO RECORDING TO AVOID DATA LOSS, BUT NOT THE ACTUAL ABILITY TO LOCALLY RECORD]]

In one aspect of the present invention, local audio devices **102** are digital, wireless microphone transceivers. Such audio devices may be manufactured as body-packs such as those typically worn by performers during a performance.

FIG. 2 depicts a block diagram of one embodiment of local audio device **102** in accordance with the present invention. In this embodiment, local audio device **102** includes, *inter alia*, local receiver **202**, local transmitter **208**, local clock **204**, local recorder **206**, and local control unit **210**. Local audio device **102** receives audio and timecode data from remote control unit **104** via local audio device receiver **102**.

Turning next to FIG. 3, illustrated is a flow diagram of one embodiment of a process for recording audio in accordance with embodiments of the present invention. Process **300** begins at **302**. For example, at **302** one or more performers may each don a local audio device, such as local audio device **102** as described with respect to FIG. 2. At **304**, a control unit, such as remote control unit **104**, transmits a time code reference signal to each local audio device receiver **202** contained within local audio device **102** and process **300** proceeds to **306**. At **306**, each local audio device control units **110**, contained within local audio device **102**, synchronizes the time code reference signal transmitted from remote control unit **104** such that each local audio device clock **204** contains identical internal time references. Process **300** then proceeds to **308**. At **308**, local audio device recorders **206**, contained within local audio devices **102**, begin recording audio. Local audio device transmitters **208** contained within local audio devices **102** then transmit the recorded audio to remote control unit **104** in real time using the identical time code reference data synchronized in **206**. Process **300** then proceeds to **310**. At **310**, process **300** queries the initiation of audio replay. The initiation of audio replay may be manual or automatic. For example, if a user detects a loss of audio, the user could manually initiate audio replay from the specific time code reference that the transmission error occurred. Alternatively, if remote control unit **104** detects a loss of audio, remote control unit **104** would signal local

audio devices **102** to retransmit the missing audio from local audio device recorder **206** via local audio device transmitter **208**.

ZAXCOM-HOW DOES THE SYSTEM AUTOMATICALLY DETECT THE LOSS OF AUDIO?

If, at **310**, audio replay is not initiated, process **300** returns to **308**. However, if at
5 **310**, audio replay is initiated, process **300** proceeds to **312**. At **312**, remote control unit **104** sends a signal to local audio device receivers **202** to begin playback. Local audio devices control units **210** then process the command to begin playback of the recorded audio and synchronize playback to the time code location indicated by remote control unit **104**. Process **300** then proceeds to **314**. At **314**, local audio device transmitters **208** transmit the
10 time code location and synchronization information at which the re-recording process begins to receiver **106**. Alternatively, at **314**, remote control unit **104** could transmit the time code location and synchronization information at which the re-recording process begins to receiver **106** at the same time as it sends the signal to the local audio device receivers **202**. Process **300** the proceeds to **316**.

15 At **316**, one or more local audio devices transmitters **208** transmit stored audio at the time code location specified by remote control unit to receiver **106**. Receiver **106** simultaneously transmits the audio to audio recorder **108** where the audio is then re-recorded. Process **300** then proceeds to **318**. At **318**, one or more audio devices **102** replay audio while audio recorder **108** re-records the audio.

20 At **320**, process **300** queries the status of audio replay. If, at **320**, the audio has been fully re-recorded, process **300** proceeds to **308** where local audio devices **102** can begin to record new audio. However, if at **320**, all of the audio has not been re-recorded, process **300** returns to **318** until all the data is re-recorded.

While the present invention has been described with reference to one or more embodiments, which embodiments have been set forth in considerable detail for the purposes of making a complete disclosure of the invention, such embodiments are merely exemplary and are not intended to be limiting or represent an exhaustive enumeration of all
5 aspects of the invention. The scope of the invention, therefore, shall be defined solely by the following claims. Further, it will be apparent to those of skill in the art that numerous changes may be made in such details without departing from the spirit and the principles of the invention.

CLAIMS

WIRELESS MICROPHONE SYSTEM

ABSTRACT

A method and apparatus for efficiently and effectively exercising, educating, amusing,
5 and feeding animals is disclosed. In one aspect of the invention, the apparatus encourages
an animal to access educational, recreational, exercise, and amusement devices by
configuring the apparatus such that the animal is most comfortable when it is eye level with
the devices. Additionally, defecation on such devices and food or water receptacles is
minimized due to strategic placement of such devices in relation to the comfortable setting
10 of the animal. In another aspect of the invention, educational, recreational, exercise, and
amusement devices are provided that also provide the animal with feelings of
accomplishment and productivity. Embodiments of the present invention are specifically
designed for the size of the animal and include lightweight, easily cleaned materials that
facilitate transportation and cleaning of the apparatus.