devices are currently engaged for communication. If both devices are engaged, the master transceiver **12** transmits a reply BACK message to the originating transceiver to acknowledge its termination request and to indicate that the status of originating device has been changed to "online" in the master table. Additionally, master transceiver transmits a STERM message to target transceiver **14***b* to indicate that originating transceiver **14***a* is terminating data communication with target transceiver **14***b*.

[0090] Responsive to the STERM message, the target transceiver **14***b* carries out the operation of checking its internal state, terminating the reception of data, and replying with an acknowledgement (ACK). The target transceiver **14***b* first checks its internal state to ensure that it is engaged in communication with originating transceiver **14***a*. If target transceiver **14***b* is engaged with a different transceiver, it replies with a NACK message to the master transceiver **12** to indicate target transceiver **14***b* is not currently engaged with originating transceiver **14***a*. If target transceiver **14***b* is engaged with transceiver **14***a*, then target transceiver **14***b* stops receiving data from transceiver **14***a* and sets its internal state to "online". Target transceiver **14***b* then transmits to master transceiver **12** an ACK message to indicate that it has terminated communication with transceiver **14***a* and that it has changed it state to "online".

[0091] When the master transceiver **12** receives the ACK message from the target transceiver **14***b*, it changes the state of target transceiver **14***b* in the master table to "online" and replies to target transceiver **14***b* with a confirmation of the state change. The master transceiver **12** also considers the data slot which was assigned to originating transceiver **14***a* as released from use and available for reallocation. When a NACK message is received by master transceiver **12** from target transceiver **14***b*, a severe error is recognized by master transceiver **12** because this state was not previously registered with the master table. The master transceiver then attempts a STERM sequence with the remaining related slave devices until the proper target transceiver is discovered or otherwise ascertained.

[0092] When a user of a slave device terminates or interrupts power to the slave or otherwise makes the slave unavailable for communication, the device preferably initiates a shutdown sequence prior to such termination. The shutdown sequence comprises a shutdown (SHUT) message from the slave device **14***n* to the master transceiver **12**, in response to an ALOHA broadcast from the master **12**. Responsive to the SHUT message, the master **12** replies to the slave device **14***n* with a BACK message indicating that state of slave device **14***n* has been changed to "offline" in the master table. Responsive to the BACK message, the slave device **14***n* changes its internal state to "offline" and shuts down.

[0093] Referring now to **FIG. 5, a** functional block diagram of the Medium Access Control hardware interface of the present invention is shown and generally designated as MAC **66**. In general, the MAC **66** is provided at the Data Link Layer between the Network Layer and the Physical Layer of the OSI reference model. More particularly, the MAC **66** provides the hardware circuitry within Medium Access Control (MAC) sublayer of the Data Link Layer according the OSI reference model. The Medium Access Control protocol provided by the present invention provides the software for controlling the processes of the various components of the MAC **66** as described below.

[0094] The MAC **66** comprises an integrated circuit or like hardware device providing the functions described herein. The MAC **66** provides means associated with each transceiver for connecting multiple data links received from the Logical Link Layer to a single physical TDMA link. The MAC **66** comprises a communication interface **68** for providing communication with the Medium Access Control Protocol **69**, a Physical Layer interface **70** for communication with the Physical layer, a plurality of slot allocation units (SAU) **72***a* through **72***n* each operatively coupled to the communication interface **68**, a Multiplexer/Demultiplexer (Mux/Demux) unit **74** operatively coupled to the Physical Layer interface **70** and each of the SAU **72***a* through **72***n*, and a Logical Link Control (LLC) interface **73** connected to each of the SAU **72***a* through **72***n*. A plurality of data interfaces **76***a* through **76***n* are also provided for transmitting data to and receiving data from the LLC interface **73**. Each data interface **76***a* through **76***n* is connected to a corresponding SAU **72***a* through **72***n*.

[0095] Data streams in the present invention will flow in both directions. For example, output data will be transmitted from higher level protocols through the DLL hardware **66** and out to the Physical Layer via interface **70**. Input data is received from the Physical Layer through interface **70** into the MAC **66** and then communicated to the higher level protocols. Within the MAC **66** the data path comprises the data interfaces **76***a* through **76***n* connected to the SAU **72***a* through **2***n*, the SAU **72***a* through **72***n* connected to the Mux/Demux **74**, and the Mux/Demux **74** connected to the Physical Layer interface **70**. The direction of data flow within each SAU **72***a* through **72***n* is controlled by the Medium Access Control protocol **69** via communication interface **68**. The communication interface **68** is preferably separated from the data path through MAC **66**. This arrangement provides simple data sources, such as audio streaming devices, a direct connection to the MAC **66**.

[0096] The Mux/Demux **74** carries out the operation of merging outgoing data streams from the SAU **72***a* through **72***n* into a single signal transmitted by the Physical Layer. In the preferred embodiment, a TDMA scheme is used for data transmission. Under the TDMA multiple access definition scheme, only one device may be transmitting at any given time. In this case, the Mux/Demux **74** is connected to the outputs of each SAU. The output of the Mux/Demux **74** is then operatively coupled to the Physical Layer interface **70**. The Mux/Demux **74** also carries out the operation of distributing incoming network data received from the Physical Layer via interface **70** into the SAU **72***a* through **72***n*. Generally, the currently active SAU will receive this incoming data.

[0097] Referring now to **FIG. 6** as well as **FIG. 5, a** block diagram of an SAU unit is shown and designated as **72**. Each SAU unit **72***a* through **72***n* are structured and configured as SAU **72**. SAU **72** comprises an output buffer unit **78**, an input buffer unit **80**, a control logic unit **82** connected to the output buffer unit **78** and the input buffer unit **80**, and control status registers **84** connected to the control logic unit **82**. The output buffer unit **78** stores data to be transmitted from a first device to another device in a First-In-First-Out (FIFO) buffer (not shown), encodes the buffer's output using a