

Models 10959-903 and 10959-904 Wall-Mount Audio Messenger Interface

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Models 10959-903 and 10959-904 Wall-Mount Audio Messenger Interface

Confidentiality Notice

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General Information

The Model 10959-903 and 10959-904 Wall-Mount AMIs (Audio Messenger Interfaces) are capable of broadcasting up to 125 pre-recorded tone/speech messages and live voice announcements. They are designed to communicate with GAI-Tronics' Model ACC2500 Audio Control Center Desk Set (via RS-232) for use in mass notification and general public address applications. Both models can be accessed via a direct telephone line connection (extension or Central Office) for dial-up, live voice announcements.

The AMI's 600-ohm, 0-dBm output can broadcast inputs to GAI-Tronics' addressable amplified speakers, stanchion broadcast products, central amplifiers, radio base stations, or to any device that accepts a telephone line level input.

The Model 10959-904 can also interface to GAI-Tronics' Page/Party[®] systems by providing a 33-ohm audio output.

The following components are included with the AMI:

- AMI (Audio Messenger Interface)
- CompactFlash® memory card
- ACT (AMI Configuration Tool) CD
- padded envelope including:
 - No. 12612-002 AMI-to-ACC2500 Interface Module
 - modular cord, four-conductor., 7-foot
 - P-Cord, Cat-5E, booted, 7-foot

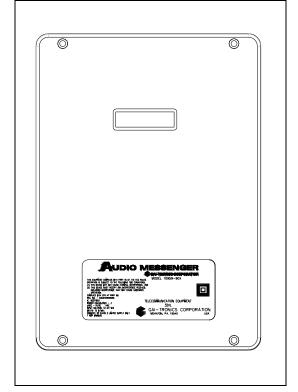


Figure 1. Model 10959-90x Wall-Mount Audio Messenger Interface (AMI)

Features

- record up to 125 tone and/or speech messages
- 600-ohm, 0 dBm, 1 V _{RMS} audio output
- scheduled events
- live or recorded speech messages
- dial-up telephone access
- direct communication with an ACC2500 Audio Control Desk Set via RS-232
- 33-ohm, 1.5 V _{RMS} audio output for page and party lines (Model 10959-904 only)

Functions

Alarms

The ACT tool includes pre-recorded tones suitable for most applications. The tones include typical emergency tones (i.e., a siren, slow whoop, etc.) and signaling or process tones (i.e., a gong, steady tone, etc.). All of the tones and speech messages broadcast by the AMI are stored in MP3 file format. For applications where a required tone is not supplied, any tone recorded or stored in an MP3 file format can be used with the AMI.

Custom speech messages can be recorded and configured for use with the AMI by recording them onto a PC and storing them in MP3 file format on the AMI's CompactFlash® memory card. Speech-over-tone messages can be created by recording live voice audio on one channel with a tone on the other channel.

Timed Events

The AMI has the capability to perform several functions based on the time of day. Events can be scheduled to occur at any interval (hourly, daily, weekly, and monthly, etc.). Scheduled events are configured using the ACT software.

Live Voice Messages

The AMI can broadcast live voice speech messages via a connected Model ACC2500 Audio Control Center Desk Set. The desk set can be configured to have any level of priority. Assign the highest priority (0), to configure the desk set for emergency voice broadcasts of live speech messages.

Telephone Operation

The AMI's telephone interface enables live speech broadcasting from a telephone. The AMI must be connected to an analog station port of a PBX type telephone system or directly to a CO (Central Office) telephone line on a PSTN (Public Switch Telephone Network) to perform this function.

A remote access security code must be entered when accessing the AMI via telephone (default programming does not include a password). This code is used to prevent unwanted callers from directly accessing the system.

The AMI's telephone interface supports two temporal modes of operation: *day mode* and *night mode*. The day mode and night mode can be configured independently of each other. As an example of different day and night modes; the day mode may be configured to allow callers to page and wait for a subsequent party line communication, while the night mode is configured to play a tone over the paging system alerting personnel of an incoming call. The call can be answered at any Page/Party[®] station in this mode.

Acoustical feedback, or *howling*, can be a problem when broadcasting from a telephone. This occurs when the telephone microphone is too close to a speaker that is broadcasting the audio created by the microphone. The AMI includes an integral feedback eliminator circuit to prevent feedback. Incoming telephone broadcasts are recorded and stored in the AMI until the telephone connection is terminated (caller hangs up) when the AMI is configured to use the feedback eliminator. The AMI plays the saved broadcast after termination of the call. The delay between the actual speech and the recording playback eliminates the possibility of feedback.

The telephone interface has multiple operational modes that are configured with the AMI Configuration Tool software application. The operational modes are as follows:

Model 10959-903

- Record Page—Records a message and delivers it to the audio line output.
- Live Page Mode—Delivers a live voice message (not pre-recorded) to the audio line output.
- Manual/Disabled—Do not use.

Model 10959-904

- Page/Party®—Delivers a live voice page (not pre-recorded) to the page line output. The party line is held open following the page.
- Record Page—Records a page, and delivers it to the page line output.
- Mixed Mode—Records a page, delivers it to the page line output, and holds the party line open following the page.
- Live Page Mode—Delivers a live voice page (not pre-recorded) to the page line output. The party line is not open following the page.
- Ring Mode—Does not deliver a page, but instead plays a configured message on the page line to signal the incoming call.
- Manual/Disabled—The telephone interface does not automatically answer the telephone. An input can be configured for *Manual Access* to allow an attendant to manually answer the phone and transfer calls to a party line.

Radio Operation

The AMI can be used to access a mobile or base radio for wireless broadcasting. Connect the AMI's audio output and control output terminals to the transmit audio and PTT inputs of the radio's accessory connector to enable broadcast of live speech and alarm tones/messages over RF (Radio Frequency) airwaves from the Model ACC2500 desk set.

NOTE: Radio audio levels can vary greatly between manufacturers. The AMI's audio level output is 1 V _{RMS}. Please contact our Service Department at 1-800-492-1212, prompt no. 2, if this level overdrives the radio input, as an attenuation circuit may be required.

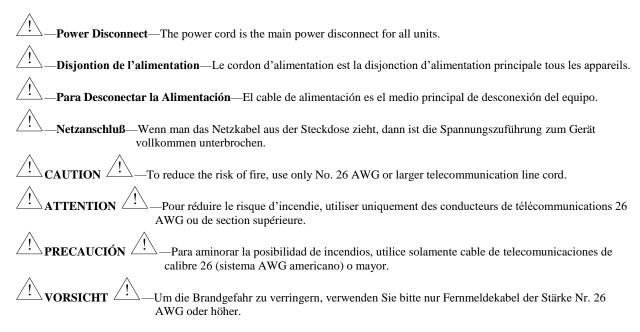
Page/Party® Operation (Model 10959-904 Only)

The Model 10959-904 AMI is equipped with a PPI (Page/Party® Interface) PCBA that plays messages/alarms and connects telephone calls to a Page/Party® system. It can generate the VLC (Volume Level Control) tone during message/alarm broadcasts that give VLC-equipped Page/Party® stations a signal to change the volume of the message/alarm being played.

When interfaced to a Page/Party[®] system, the operation of the AMI's telephone interface includes all page modes and operates as described in the <u>Telephone Operation</u> section. The selected party line is hardwired in the system and cannot be changed by the caller or the AMI configuration tool.

A user on the Page/Party[®] system can also initiate a call by using the *party hot dial* feature. Party hot dial is configured using the ACT Tool. The AMI will then recognize when a station goes off-hook on the designated party line, and will automatically dial a preprogrammed telephone number. The call is terminated after the hang-up delay expires when the station goes on-hook.

Installation



Mounting



Warning: Observe precautions for handling electrostatic sensitive devices.

- 1. Loosen the four screws on the front cover.
- 2. Open the hinged front cover of the enclosure and turn it to the left.
- 3. Remove the cable connections between the front cover and the rear enclosure.
- 4. Pull the front cover of the enclosure up on the left side of the enclosure until the hinge pins pull loose to separate the front and rear sections. Set the front half of the enclosure aside.
- 5. Determine the conduit or cable gland location on the rear enclosure.

Drill spots have been provided on the top and bottom for use with either a chassis punch or hole saw.

- 6. Cut or punch the appropriate size hole(s) in the enclosure.
- 7. Use Myers[™] ST-4 (1.25-inch) Scru-Tite[®] hubs or equivalent.

Reducers must be used for smaller conduit sizes to ensure proper contact with the supplied grounding plates. Hub(s) must be connected to the conduit before being connected to the enclosure.

8. Secure the rear enclosure to the wall with screws or appropriate fasteners.

The enclosure mounting holes are 0.280-inches in diameter.

Field Wiring

- 1. Route all necessary cabling through conduit(s) and into the enclosure. Allow adequate cable lengths to reach the terminal blocks.
- 2. Terminate all field wiring following the instructions below.
- 3. Reconnect the front cover to the rear enclosure by pushing the hinge pins on the front cover into the rear enclosure until a click is heard.
- 4. Re-install the cable connections between the front cover and the rear enclosure.
- 5. Rotate the front cover to close the enclosure and tighten the four screws on the front cover.

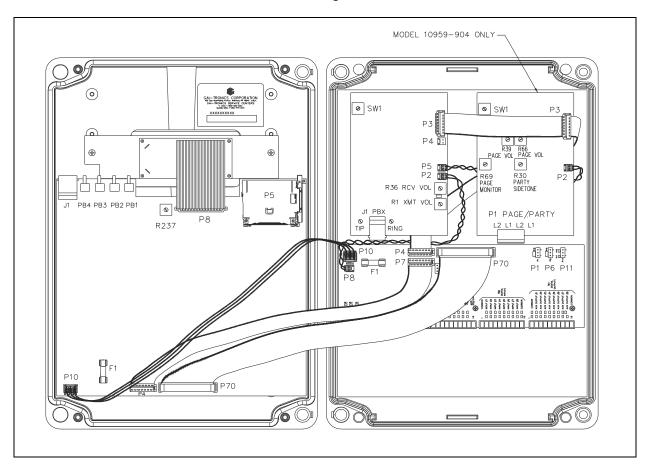


Figure 2. Internal Wiring Connections

Audio Output

Terminal block **TB3**, labeled AUDIO, is located on the termination PCBA. Connect the 600-ohm balanced audio output terminals TB3-1 and TB3-2 to a public address system (central amplifier input, amplified addressable speaker input, etc.). Use shielded pair conductors when connecting audio to any public address system component.

Table 1. Audio Output Connection

Termination PCBA Label	Internal Terminal Pin-Out	Function or ACT Description
600-онм L1	TB3-1	600-ohm audio pair to distribution amplifier cabinet, stanchion broadcast electronics module, addressable
600-онм L2	TB3-2	amplified speaker, or other 600-ohm compatible device
AUDBUS2 L1	TB3-3	no connection
AUDBUS2 L2	TB3-4	no connection
AUDBUS1 L1	TB3-5	no connection
AUDBUS1 L2	TB3-6	no connection
PGND	TB3-7	no connection
RS485 INT GND	TB3-8	
RS485 INT-	TB3-9	no connection
RS485 INT+	TB3-10	

Control Output

Terminal block **TB4**, labeled **SYSTEM**, is located on the termination PCBA. Connect the contact closure output terminals **TB4-7** and **TB4-8** to the page control input on the addressable amplified speaker or stanchion broadcast module.

Table 2. Control Output Connection

Termination PCBA Label	Internal Terminal Pin-Out	Function or ACT Description
EXT DATA GND	TB4-1	no connection
EXT DATA -	TB4-2	no connection
EXT DATA +	TB4-3	no connection
FLT	TB4-4	no connection
REBOOT	TB4-5	no connection
GND	TB4-6	no connection
AUD ACT 1	TB4-7	isolated solid state relay, closed during AMI broadcast
AUD ACT 2	TB4-8	On resistance = 30 ohms

Telephone Line

The Model 10959-903 and 10959-904 Audio Messenger Interfaces are equipped with a telephone interface PCBA. Make a connection from a standard PBX analog station port or CO telephone line to the AMI' telephone interface PCBA, **PBX** jack **J1**, with an RJ-11 plug-in connector or screw the wires to the appropriate terminals; tip (green), and ring (red). The AMI includes a telephone line cord with modular RJ-11 plugs.

NOTE: Telephone interface operation requires a minimum loop current of 25 mA.

ACC2500 Audio Control Center Desk Set

The Model ACC2500 Desk Set connection requires a No. 12612-002 Interface and two modular cables (included with the AMI). Connect an 8-conductor, Cat 5 Ethernet cable (customer provided) from the No. 12612-002 Interface to Ethernet connector J1 (on the main PCBA) in the AMI (see <u>Figure 3</u> and <u>Figure 4</u>).

NOTE: maximum Cat 5 cable length is 45-feet

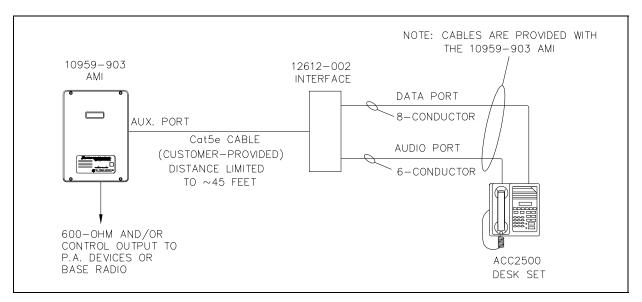


Figure 3. Typical ACC2500 Connection Diagram

Page/Party® (Model 10959-904 Only)

Connector P1, located on the PPI (Page/Party[®] Interface) PCBA, provides connectivity to a Page/Party[®] system.

PPI PCBA Label	Internal Terminal Pin-Out	Function or ACT Description
Party L1	P1-1	33-ohm line interface to GAI-TRONICS party line
Party L2	P1-2	internal 33-ohm termination
Page L1	P1-3	33-ohm line interface to GAI-TRONICS page line
Page L2	P1-4	external 33-ohm termination required

Table 3. Page/Party® Connections

NOTE: Pin 1 on this connector is on the right side.

Power

Terminal block, **TB6**, labeled **CLASS 2 12–24 VDC**, is located on the termination PCBA. It provides the required 12–24 V dc power connection to the AMI.

Table 4. Input Power Connection

Termination PCBA Label	Internal Terminal Pin-Out	Function or ACT Description
+	TB6-1	positive terminal of external power supply (black wire with white stripe from power supply)
_	TB6-2	negative terminal of external power supply (solid black wire from power supply)
GND	TB6-3	frame ground

No Connections

The following connections on the termination PCBA are not used by the Model 10959-903 and 10959-904 Audio Messenger Interfaces:

- digital outputs (TB1)
- digital inputs (TB2)
- auxiliary audio (J1)

Configuration

Opening the Unit

- 1. Loosen the four screws on the front cover.
- 2. Open the hinged front cover of the enclosure and turn it to the left.

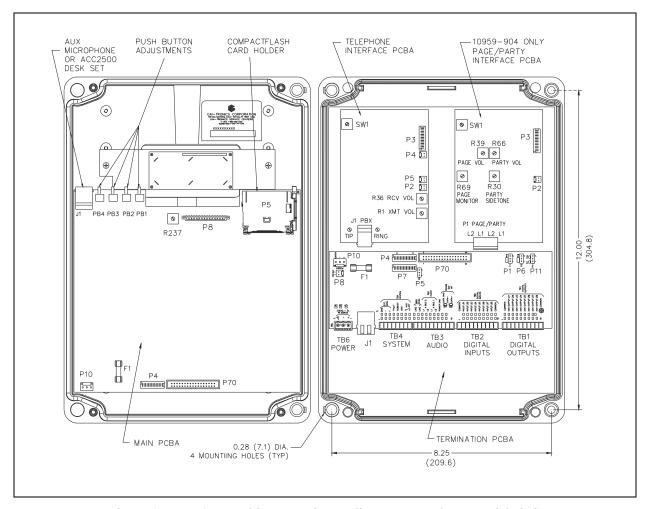


Figure 4. AMI (open with connections, adjustments, and PCBAs labeled)

600-Ohm Line Termination Jumper Setting

Terminate the 600-ohm audio lines with 600 ohms for impedance matching. Use jumper P5, located on the termination board to enable/disable impedance matching on the 600-ohm audio line connections (see <u>Figure 4</u> and <u>Table 5</u>).

Table 5. Termination PCBA—P5 Jumper Function

Jumper	Output	Position	Function
	TB3-1, 2	1-2	600-ohm resistor connected (ADVANCE position)
	600 ohms	2-3	default: unterminated

Level Adjustments

Display Brightness

Adjust potentiometer R237, on the main PCBA, to change the brightness of the LCD display on the front of the assembly.

Telephone Line Levels

Two potentiometers on the optional telephone interface PCBA adjust the telephone audio levels:

- Volume level from telephone line—Adjust the receiver volume potentiometer, R36.
- **Volume to telephone line**—Adjust the transmit volume potentiometer, R1.

Party Line Levels (Model 10959-904 Only)

Two potentiometers on the Page/Party[®] Interface PCBA adjust the party line audio levels:

- **Volume level to party line**—Adjust the party volume potentiometer, R66.
- **Sidetone level from party line**—Adjust the party sidetone potentiometer, R30.

Page Line Levels (Model 10959-904 Only)

Two potentiometers on the Page/Party® Interface PCBA adjust the page line audio levels:

- Volume level to the page line—Adjust the page volume potentiometer, R39.
- Page line audio monitor level—Adjust the page monitor potentiometer, R69.

Date and Time Set Up

Date Set Up

Use the push buttons located on the top edge of the main PCBA to set the date (see <u>Figure 4</u> for the locations of the push buttons). Complete the following procedure to set the date:

- 1. Press **<ENTER>**, PB4, to enter the menu system.
- 2. Press **SELECT**>, PB3, to scroll to the DATE: display.
- 3. Press **<ENTER>**, PB4, to enter the DATE set up.
- 4. Press **ENTER**>, PB4, to confirm choice.
- 5. Press **<UP>**, PB1 or **<DOWN>**, PB2 to select the desired day.
- 6. Press **SELECT**>, PB3, to scroll to the month.
- 7. Press **<UP>**, PB1 or **<DOWN>**, PB2 to select the desired month.
- 8. Press **SELECT**>, PB3, to scroll to the year.
- 9. Press <UP>, PB1 or <DOWN>, PB2 to select the desired year.
- 10. Press **<ENTER>**, PB4, to accept the DATE setting.

Time Set Up

Use the push buttons located on the top edge of the main PCBA to set the time. Complete the following procedure to set the time:

- 1. Press **<ENTER>**, PB4, to enter the menu system.
- 2. Press **SELECT**>, PB3, to scroll to the TIME: display.
- 3. Press **ENTER**>, PB4, to enter the TIME: set up.
- 4. Press **<ENTER>**, PB4, to confirm choice.
- 5. Press **<UP>**, PB1 or **<DOWN>**, PB2 to select the desired hour.
- 6. Press **SELECT**>, PB3, to scroll to the minute.
- 7. Press **<UP>**, **PB1** or **<DOWN>**, **PB2** to select the desired minute.
- 8. Press **<ENTER>**, PB4, to accept the TIME: setting.

ACT (AMI Configuration Tool)

Overview

The ACT (AMI Configuration Tool) software is used to define and change configurations for the AMI, and is included with the unit. The AMI accesses a CompactFlash® memory card that is pre-programmed with the 10959-903 or 10959-904 product configuration to retrieve configurations and play audio messages.

Please refer to the ACT software online help for specific instructions.

System Requirements

The ACT software must be installed on a Windows PC (Windows® XP/7/10) equipped with a USB port. A reader/writer capable of programming CompactFlash® memory cards must be connected to the USB port. The CompactFlash® reader/writer is not included with the AMI.

CompactFlash®

The CompactFlash® memory card stores the system configuration, speech messages, and alarm tones. Complete the following instructions to install the memory card:

- 1. Insert the memory card through the rectangular MEMORY CARD slot on the AMI main board with the label on the memory card facing up.
- 2. Slide the memory card in until it is fully seated in the slot.

When seated properly, the card protrudes approximately \(\frac{1}{4} \) inch from the front of the socket.

NOTE: The memory card and its socket are keyed for proper insertion—*do not force the card into the socket.*

3. Reboot the system so the AMI unit can read the memory card.

Parameter Configuration

Fragments

All tones and voice messages are digitally recorded and stored on the CompactFlash® card as audio fragments stored in MP3 files.

Messages

Each message is a collection of fragments. The content of each message must be defined by selecting the fragment(s) to be incorporated into the message. Other message parameters include:

- message title
- priority
- volume
- play mode and repeat interval

Event Scheduling

Use the event-scheduling feature to set up messages to automatically play at certain dates and times. Set the following parameters when scheduling events:

- start and stop times
- start and stop dates
- event duration and intervals

Telephone Interface

Configure the following parameters if using the telephone interface:

- number of rings before answer
- message mode (live or recorded)
- message delay, if recorded
- maximum message duration
- selection of a greeting message to be played to the caller
- selection of a pre-announcement tone to be played to the PA system

Page/Party[®] Interface (Model 10959-904 Only)

The following parameters can be set for the Model 10959-904 Page/Party[®] Interface:

- VLC activation
- party hot dial

Verification

Verify that the AMI is installed correctly and that all connections are made per the Installation section of this manual before beginning unit testing or operation.

Verify the following:

- dc power connection and polarity is correct
- 600-ohm audio is connected
- control contact output is connected
- telephone line is connected (if required)
- No. 12612-002 and Model ACC2500 are properly connected

Refer to Pub. 42004-417, Model ACC2500 Audio Control Center User and Installation Manual for additional information pertaining to system setup.

Operation

The AMI operates based on system inputs and outputs or by manual operation after the CompactFlash® has been programmed and installed in the unit.

LCD Display at Initial Power Up

The AMI completes a self-diagnostic of its settings at initial power up. The LCD display cycles through the following messages:

- AMI firmware version
- boot DSP
- media detected
- EEPROM firmware version
- DSP firmware version
- progress bar/LOAD CONFIG
- configuration version
- configuration date and time
- configuration file name
- HIO (I/O control module) board firmware version or HIO NOT INSTALLED.
- ASM (Zone Interface Module) board firmware version or ASM NOT INSTALLED.
- Page/Party® board firmware version
- AMI main board firmware version
- telephone interface mode (if telephone interface installed)
- telephone interface board firmware version or TELEPHONE INTERFACE NOT INSTALLED.
- telephone interface greeting file name (if recording a new greeting)
- AMI ready
- time, page symbol/date

LCD Display during Operation

The LCD uses various symbols to indicate AMI activity:

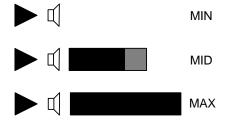
• The VU meter indicates the volume of a page playing.



Mute indicates the page audio is muted.



Progress bar indicates remaining time for the party line connection timeout.



Telephone handset indicates the AMI unit is being accessed via a telephone connection.



Microphone indicates a page from the auxiliary jack.



• Off hook indicates that a digital input designated as party line off hook is active.



• Right/left arrows indicate transmit and receive activity on the auxiliary jack or external RS-485.





- Text display (scrolling) displays current system status, such as the name of the current message playing, telephone connection status, and party connection status.
- Rotating slash, when visible, indicates the AMI has a lower priority message pending, ready to be played.



Push-Button Operation

Front panel push buttons provide menu access for various control features including, play a message, stop a message, and firmware update.

Stop Message

This menu item halts the currently playing message. The button sequence is:

- 1. Press **ENTER**>, PB4, to enter the menu system.
- 2. Press **ENTER**>, PB4, to select the STOP: item.
- 3. Press **ENTER**>, PB4, to confirm the selection.

Play Message

This menu item plays a specific message. Messages are grouped by priority (1 through 7). The button sequence allows the user to select a message to be played from a specific priority group:

- 1. Press **ENTER**>, PB4, to enter the menu system.
- 2. Press **SELECT**>, PB3, to scroll to the PLAY: item.
- 3. Press **ENTER**>, PB4, to enter the PLAY: item.
- 4. Press **SELECT**>, PB3, to scroll to the message.
- 5. Press **<ENTER>**, PB4, to play the selected message.

Firmware Update

This menu item facilitates updating the firmware of the AMI main board. The button sequence used is:

- 1. Press **<ENTER>**, PB4, to enter the menu system.
- 2. Press **SELECT**>, PB3, to scroll the menu to the FIRMWARE UPDATE: item.
- 3. Press **<ENTER>**, PB4, to select the FIRMWARE UPDATE: item.
- 4. Press **ENTER**>, PB4, to confirm the selection.

Reset AMI

Complete the following menu sequence to restart the AMI:

- 1. Press **ENTER**>, PB4, to enter the menu system.
- 2. Press **SELECT**>, PB3, to scroll the menu to the SYSTEM REBOOT: item.
- 3. Press **ENTER**, PB4, to select the SYSTEM Reboot: item.
- 4. Press **ENTER**>, PB4, to confirm the selection.

Return

Select this menu item to return the system to normal operation mode:

- 1. Press **ENTER**>, PB4, to enter the menu system
- 2. Press **SELECT**>, PB3, to scroll the menu to the RETURN item
- 3. Press **ENTER**, PB4, to select the RETURN menu item and return to normal operating mode.

Maintenance

If your AMI requires depot repair service, contact your GAI-Tronics Regional Service Center for a Return Authorization Number. Call 1-800-492-1212 inside the USA or 610-777-1374 outside the USA for help identifying the Regional Service Center nearest you.

Replacement Parts

Table 6. Replacement Parts

Model Number	Description
69517-204	Termination PCBA
69462-001	Telephone Interface PCBA
69449-101	AMI Main PCBA
69463-001	Page/Party [®] Interface PCBA (Model 10959-004 only)
49100-007	CompactFlash [®] Card (blank)

Specifications

Power Supply (No. 3308-50008-00, UL listed, provided with AMI)

Voltage input	120 V ac
Voltage output	12 V dc
	1 A maximum
Audio	
Speech capacity	500 minutes with 512 Mb CompactFlash® card
Frequency response	250–6500 Hz, +0/–3 dB ref. to 1 kHz
Distortion	<1% THD @ 1 kHz @ nominal settings
Audio and Telephone Line Levels	
600-ohm audio output	
600-ohm audio output	adjustable, 0 dBm nominal
Telephone line input	adjustable, 0 dBm nominal
Telephone line loop current requirement	25 mA minimum
33-ohm page line input/output (Model 10959-904	only)1.5 V _{RMS} nominal
33-ohm party line input/output (Model 10959-904	4 only)
Output Control (present with 600-ohm a	audio output)
Solid state relay output	dry contact rated at 125 mA
Mechanical	
Enclosure material	high-impact, glass-reinforced polyester, gray
Mounting	wall mounting; four 0.28 mounting holes
Connections	four drill spots for location of conduit
Dimensions	13.00 H \times 9.25 W \times 4.00 D in; (330 \times 235 \times 102 mm)

Safety of Information Technology Equipment......UL 60950, CAN/CSA-C22.2 No. 60950-00, IEC 60950

Warranty

Equipment. GAI-Tronics warrants for a period of one (1) year from the date of shipment, that any GAI-Tronics equipment supplied hereunder shall be free of defects in material and workmanship, shall comply with the then-current product specifications and product literature, and if applicable, shall be fit for the purpose specified in the agreed-upon quotation or proposal document. If (a) Seller's goods prove to be defective in workmanship and/or material under normal and proper usage, or unfit for the purpose specified and agreed upon, and (b) Buyer's claim is made within the warranty period set forth above, Buyer may return such goods to GAI-Tronics' nearest depot repair facility, freight prepaid, at which time they will be repaired or replaced, at Seller's option, without charge to Buyer. Repair or replacement shall be Buyer's sole and exclusive remedy. The warranty period on any repaired or replacement equipment shall be the greater of the ninety (90) day repair warranty or one (1) year from the date the original equipment was shipped. In no event shall GAI-Tronics warranty obligations with respect to equipment exceed 100% of the total cost of the equipment supplied hereunder. Buyer may also be entitled to the manufacturer's warranty on any third-party goods supplied by GAI-Tronics hereunder. The applicability of any such third-party warranty will be determined by GAI-Tronics.

<u>Services.</u> Any services GAI-Tronics provides hereunder, whether directly or through subcontractors, shall be performed in accordance with the standard of care with which such services are normally provided in the industry. If the services fail to meet the applicable industry standard, GAI-Tronics will re-perform such services at no cost to buyer to correct said deficiency to Company's satisfaction provided any and all issues are identified prior to the demobilization of the Contractor's personnel from the work site. Re-performance of services shall be Buyer's sole and exclusive remedy, and in no event shall GAI-Tronics warranty obligations with respect to services exceed 100% of the total cost of the services provided hereunder.

<u>Warranty Periods.</u> Every claim by Buyer alleging a defect in the goods and/or services provided hereunder shall be deemed waived unless such claim is made in writing within the applicable warranty periods as set forth above. Provided, however, that if the defect complained of is latent and not discoverable within the above warranty periods, every claim arising on account of such latent defect shall be deemed waived unless it is made in writing within a reasonable time after such latent defect is or should have been discovered by Buyer.

<u>Limitations / Exclusions.</u> The warranties herein shall not apply to, and GAI-Tronics shall not be responsible for, any damage to the goods or failure of the services supplied hereunder, to the extent caused by Buyer's neglect, failure to follow operational and maintenance procedures provided with the equipment, or the use of technicians not specifically authorized by GAI-Tronics to maintain or service the equipment. THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES AND REMEDIES, WHETHER EXPRESS OR IMPLIED BY OPERATION OF LAW OR OTHERWISE, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Return Policy

If the equipment requires service, contact your Regional Service Center for a return authorization number (RA#). Equipment should be shipped prepaid to GAI-Tronics with a return authorization number and a purchase order number. If the equipment is under warranty, repairs or a replacement will be made in accordance with the warranty policy set forth above. Please include a written explanation of all defects to assist our technicians in their troubleshooting efforts.

Call 800-492-1212 (inside the USA) or 610-777-1374 (outside the USA) for help identifying the Regional Service Center closest to you.