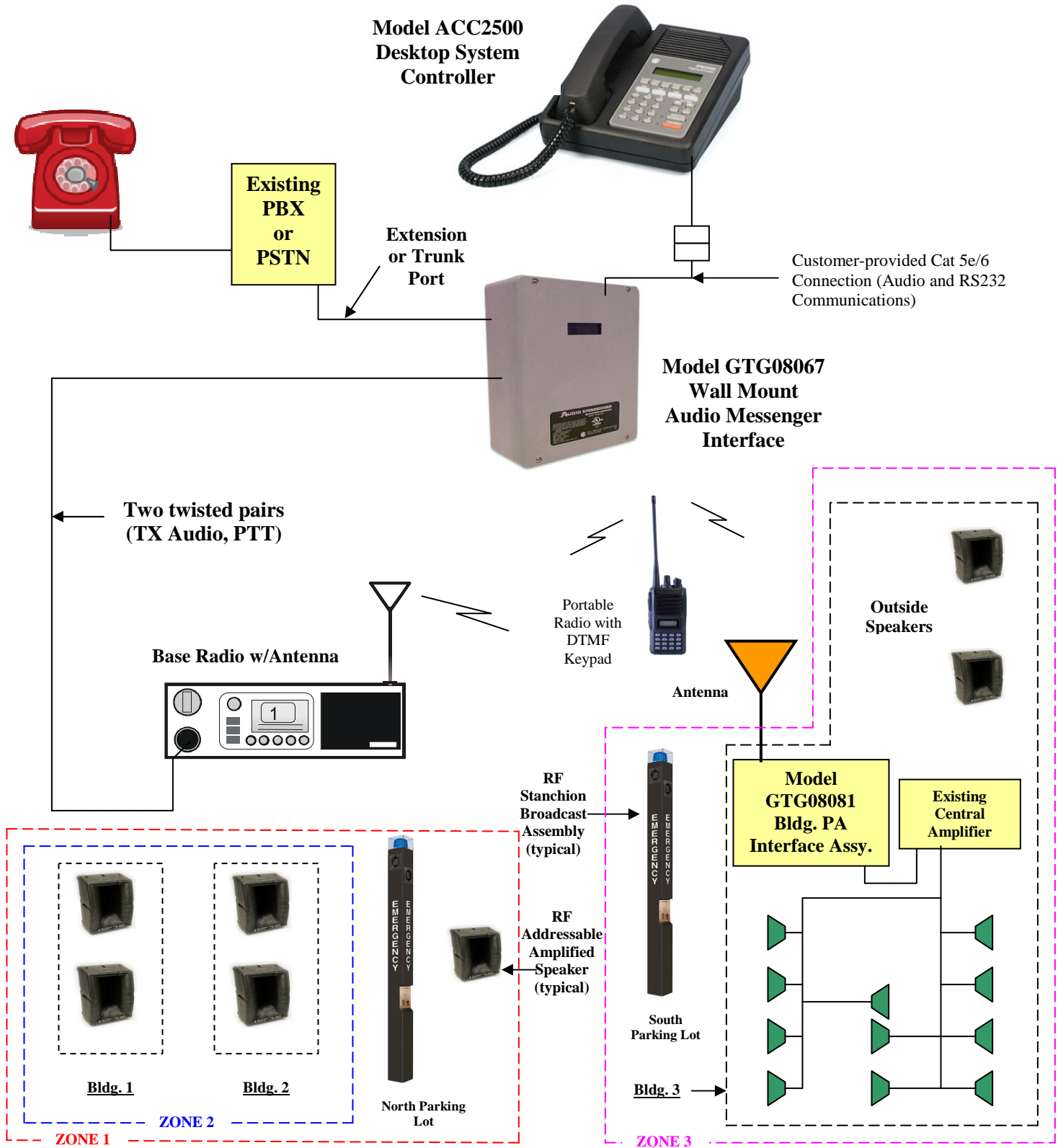


AUDIO CONTROL CENTER RADIO ACCESS SYSTEM INTERCONNECTION



- Notes:**
1. Each Addressable Amplified Speaker will require 120 Vac (12 Vdc power supply) or solar power.
 2. Each Stanchion Broadcast Assembly will require 120 Vac power.

Radio Access Public Address/Alarm System

GENERAL

The proposed GAI-Tronics Public Address/Alarm System consists of the following items:

- Model ACC2500 Desktop Controller
- Model GTG08067 Audio Messenger Interface
- Model GTG08081 PA Interface Assembly (if applicable)
- RF Stanchion Broadcast Assemblies (if applicable)
- RF Addressable Amplified Speakers (if applicable)
- Appropriate Radio Equipment (provided by others)

The communication medium between the ACC2500 Desktop Controller and the GTG08067 Audio Messenger Interface will be via customer-provided Cat 5e/6 cable with RJ-45 connections. The maximum distance allowable between the ACC2500 and the GTG08067 can not exceed a total of 50 feet. The audio output of the Audio Messenger Interface connects to a radio base station with a twisted audio pair and dry contact closure (PTT) pair. The base radio, and any required repeaters, will provide the RF audio signals to all system components. These will include:

- GAI-Tronics' RF Addressable Amplified Speakers (13362, 13372)
- GAI-Tronics' RF Stanchion Broadcast Products (234SBA, 234SBM)
- GAI-Tronics' RF PA Interface Assembly (GTG08081)

The Public Address speaker system will be capable of being accessed from the Model ACC2500 Desktop Controller with pre-recorded alarms and voice messages, from the existing telephone system (live voice access only), or from the existing radio system (live voice access only). Desktop Controller and telephone system access will be routed through the base radio for wireless signal distribution to the system devices. Note that access from the radio system requires radios that are equipped with DTMF keypad (DTMF encode).

OPERATION

RF Addressable Amplified Speakers, RF Stanchion Broadcast Products, and RF PA Interface Assemblies

Each Addressable Amplified Speaker (13362 or 13372) and Stanchion Broadcast Product (234SBA or 234SBM) includes an addressable (via DTMF), integral amplifier and built-in RF receiver. The Model GTG08081 PA Interface Assembly includes addressable circuitry and a built-in RF receiver. Each unit is capable of being programmed for up to eight (8) DTMF access codes. The first programmed access code will always be the individual unit's address. This address will be used not only to broadcast specifically from that unit, but also to remotely adjust that unit's output volume level (volume adjustment pertains to stanchion broadcast products and amplified speakers only).

Each unit's amplifier circuitry will remain in a rest or sleep mode until it receives a carrier detect signal from the integral radio and valid access code (via the appropriate licensed VHF or UHF frequency and PL code). Once a valid address code is received, the amplifier circuitry will continue to broadcast until audio RF carrier is no longer detected. With the loss of RF carrier for a pre-programmed amount of time, the amplifier circuitry will return to sleep.

The PA Interface Assembly is designed to provide a 600 Ohm audio output to existing or new central amplifier equipment intended to power a series of connected speakers. These units will provide an output only when the appropriate DTMF access code is received. Like the amplified speakers and stanchion broadcast products, the interface will return to sleep mode when the RF carrier is lost for a pre-

programmed amount of time. This interface, and consequently the building or area it controls, is accessible in the same format as are the Addressable Amplified Speaker and the Stanchion Broadcast Products.

Head-End Equipment

The system head-end will include a Model ACC2500 Desktop Controller and Model GTG08067 Audio Messenger Interface (AMI). The AMI must be installed within 50 feet of the controller, due to the limitations of the RS232 communication link between the two. The system is designed to be controlled from this central location but a secondary Desktop Controller can be installed as back up to the primary. The back-up configuration would operate in a “hot-standby” mode, meaning the system would automatically switch over to the back-up unit if the primary unit is lost (power loss or cable/line disconnect).

Model ACC2500 Desktop Controller

The Model ACC2500 Desktop Controller will be capable of performing the following functions:

Manual Voice Broadcast – Each stanchion or speaker assembly will be programmed for access via specific DTMF addresses (up to 8 addresses per stanchion assembly). The Desktop Controller will be capable of entering individual, zone (group), or all-call addresses via a pre-programmed, scrolled alias list appearing on the integral 32-character, LCD display or via manual access code entry. Entering the desired address/zone and pressing the Transmit button will address the desired unit(s) and allow the voice announcement to be heard over the appropriate speaker assemblies. The operator will hear a splash tone, indicating when to begin speaking. Broadcasting can occur with the handset on-hook or off-hook. A “splash tone” will be heard over the system speakers prior to the voice broadcast.

Addressable Alarms – The Desktop Controller will be capable of activating up to 120 tone, speech, or tone/speech messages. This can be accomplished via an alarm number entered manually or selected from an alias list that can be scrolled from the deskset’s LCD display. In addition to activating the alarm, the operator can direct the alarm to a specific stanchion or speaker assembly, zone, or all units by first selecting the desired zone or address.

One-button Alarms – The Desktop Controller will allow activation of up to 8 individual alarms that can be programmed to send a specific alarm/message to a specific location at the press of a button. This is an excellent application for alarms/messages that may affect the entire campus.

Voice Broadcast Override – The Desktop Controller will allow the operator to broadcast over top of an alarm already in progress. The system will automatically mute or reduce the alarm level for the duration of the voice broadcast, then resume the alarm broadcast at normal level after the voice broadcast is complete.

Alarm Monitor – All alarms/messages generated by the AMI and broadcasted to the stanchion and/or speaker assemblies will also be heard in the Desktop Controller’s integral speaker or the handset receiver (if off hook). This provides the operator the assurance that the alarm is active and the ability to hear exactly which alarm is being broadcast. Any dial-up telephone audio will also be heard via the integral speaker or handset receiver.

Broadcast Deactivation – The Desktop Controller is equipped with a “Deactivate” pushbutton that, when pressed, will immediately deactivate all speakers assemblies and return them to their sleep or rest state. This will allow for manual deactivation of the speaker assemblies if an erroneous signal is keeping the speakers’ amplifier circuits live (line noise, RF interference, etc.).

The Model ACC2500 Desktop Controller can be programmed to display each zone as an alias on its LCD display. Alias simply means a “name” for the zone or address. The same can be programmed for each individual unit. To broadcast a pre-programmed message/alarm to a specific zone or unit, the Desktop Controller operator will press the Zone UP or DOWN button to locate the desired zone, press the Alarm

UP or DOWN button to locate the desired alarm (evacuate, tornado, all clear, etc.), the press the TRANSMIT button. The alarm will begin broadcasting only in the selected zones or units. The audio that will be heard from each speaker or stanchion selected will also be heard over the Desktop Controller's integral speaker. If the handset is off-hook, this audio will be heard over the handset receiver (earpiece). The message/alarm will play for the duration it has been programmed to broadcast or until the DEACT button is pressed to deactivate all units.

If a the Desktop Controller operator desires to broadcast a live voice message while a pre-programmed message/alarm is in progress, they simply press the transmit button and talk or lift the handset from its cradle and talk while pressing the handset pressbar. The pre-programmed message/alarm audio level will be reduced or muted (depending on programming) for the duration of the live voice broadcast (TRANSMIT button or pressbar must be activated during live voice broadcast). Releasing the TRANSMIT or pressbar will allow the pre-programmed message/alarm to return to normal volume.

If the Desktop Controller operator desires to simply broadcast a live voice message, they must select the zone alias or enter the desired zone code via the keypad, press and hold the TRANSMIT button (or handset pressbar), and begin speaking when "TALK NOW" appears in the LCD display.

Model GTG08067 Audio Messenger Interface

The Model GTG08067 Audio Messenger Interface (AMI) provides superior quality digital tone/speech generation and telephone interface and feedback elimination capability. A Compact Flash™ Card Kit stores the configuration programming, the voice and tone recordings, and provides CD-quality sound reproduction.

Direct RS232 access from the Model ACC2500 Desktop Controller allows access to the full 250 tone/message library available in the AMI. Each alarm/message can be programmed for continuous play, timed duration, or number of repeat cycles. Pre-recorded speech messages can be wave file or MP3 format

LIVE VOICE TELEPHONE SYSTEM ACCESS

In addition to the head-end controller operation, the system can be accessed for a live voice broadcast via the campus telephone system. An extension number would need to be provided for telephone access. Upon dialing this number, the telephone operator would receive verbal instructions followed by a splash tone. Upon receipt of the splash tone, the operation will dial the DTMF access code of the desired voice broadcast location. As with the deskset, this can be an individual stanchion assembly, a zone or group, or all stanchion assemblies. This is a voice broadcast operation only, as no alarms can be activated from the telephone.

LIVE VOICE RADIO SYSTEM ACCESS

The public address system can also be accessed for a live voice broadcast from an existing VHF (154 - 174 MHz) or UHF (450 - 470 MHz) radio system. Radio equipment with integral DTMF keypads (DTMF encode) is necessary to perform the live voice access. The same DTMF codes utilized by the telephone system operation previously mentioned will be utilized by the radios. The radio operator would simply select the operating frequency and, while engaging the PTT, transmit the DTMF code and begin speaking into the radio microphone. This is a voice broadcast operation only, as no alarms can be activated from a radio.

RADIO ACCESS INTERCONNECTION DIAGRAM

The Radio Access Interconnection Diagram depicts the signal flow and operation. The ACC2500 Desktop Control Station communicates with the GTG08067 Audio Messenger Interface to send pre-recorded or live audio to the radio base station. The base radio will transmit the received signal over the radio airwaves. Only those assemblies programmed for the transmitted DTMF access code will activate and broadcast the received audio. Any radio in the system, if equipped with a DTMF keypad, has the ability to access the system for live voice broadcasts. Additionally, live voice broadcasts can be initiated from the existing telephone system. The same DTMF access codes will be used for both radio and telephone broadcasts.

For example purposes, the system noted on the interconnection diagram has been divided into three distinct areas or Zones; Zone 1, Zone 2, and Zone 3. Each zone includes the following areas:

- Zone 1 includes Zone 1 (Bldg. 1 and Bldg. 2) and the Stanchion Broadcast Assembly and Addressable Amplified Speaker located in the North Parking Lot area (access code **1001**)
- Zone 2 includes Building 1 and Building 2 only (access code **1002**)
- Zone 3 includes both internal and external speakers located in/on Building 3 and the Stanchion Broadcast Assembly located in the South Parking Lot area (access code **1003**)
- All Zones (access code **2222**)

Note: Access codes used in the example are arbitrary and can be programmed for 2 to 8 digits (all codes must be the same number of digits).

Each device installed in the example system will be programmed for a minimum of three access codes (individual, zone, all). The speakers installed at buildings 1 and 2 will be programmed for four codes, due to the fact that they are part of two separate zones. Building 1 and Building 2 each have two speakers mounted to them. These two buildings, combined with a Stanchion Broadcast Assembly and an Addressable Amplified speaker located near the North Parking Lot, are considered Zone 1. Building 1 and Building 2, as a stand-alone entity, are considered a zone itself (Zone 2). Transmitting the Zone 1 access code would cause all four speakers on the buildings, the stanchion, and the single amplified speaker to broadcast. If the access code for Zone 2 is transmitted, only the speakers on Buildings 1 and 2 would broadcast. It is also possible to access any single speaker or stanchion within these zones, if desired.

For the sake of simplicity and understanding, we'll assume that the desired operation is to enter a DTMF code and perform a live voice page. Here are the steps needed from each broadcasting device (Desktop Controller, telephone, radio). In this scenario, the person broadcasting intends to perform a live voice broadcast into Zone 1 (code **1001**).

ACC2500 Desktop Controller:

- Press the CALL button
- Enter the code **1001** via the keypad (will be seen in the LCD display)
- Press and hold the TRANSMIT button or handset pressbar
- Begin speaking when TALK NOW appears in the LCD display
- Release the TRANSMIT button or handset pressbar when complete

Telephone:

- Dial the extension assigned to system access
- Wait for voice instructions and splash tone, then dial the code **1001** and begin speaking
- Hang up when broadcast is complete

Radio:

- Select the associated operating frequency on the radio
- Press and hold the PTT switch while entering the code **1001**
- Still holding the PTT switch, speak into the radio
- Release the PTT switch when broadcast is complete

The described operation allowed each operator to generate a live voice broadcast into Zone 1 (Buildings 1 and 2 and the North Parking Lot). To broadcast only into Zone 2 (Buildings 1 and 2), enter **1002**; Zone 3 (Building 3 and the South Parking Lot), enter **1003**. To broadcast to all zones, code **2222** would be

entered. Assuming the amplified speaker located in the North Parking lot has an access code of **3001**, entering this code will access only this speaker. Note that this is the access code that would be used to remotely adjust this unit's output volume.