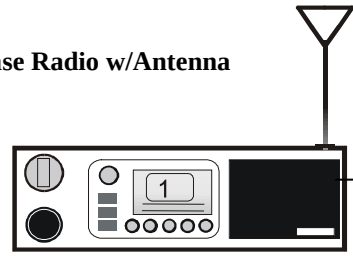
RADIO VOICE ACCESS ONLY
SYSTEM INTERCONNECTION

Model IPE2500A
Tone Remote Deskset
Controller

Twisted Telephone Pair

Base Radio w/Antenna



Interconnecting Cable
Provided with
ITA2000A

Model ITA2000A
Tone Remote Adapter

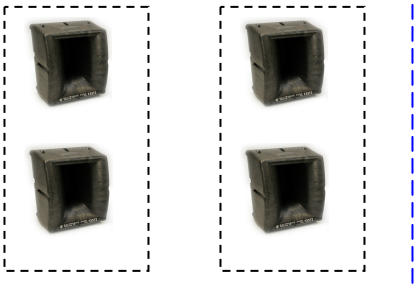
Portable
Radio with
DTMF
Keypad

RF
Stanchion
Broadcast
Assembly
(typical)

Antenna

Outside
Speakers

RF
Addressable
Amplified
Speaker
(typical)



North Parking
Lot

Bldg. 1

Bldg. 2

ZONE 2

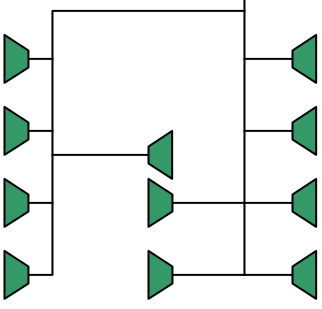
ZONE 1

South
Parking Lot

Bldg. 3

Model
GTG08081
Bldg. PA
Interface Assy.

Existing
Central
Amplifier



ZONE 3

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 Voice Access Public Address System

GENERAL

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

- Model IPE2500A Tone Remote Deskset Controller
- Model ITA2000A Tone Remote Adapter
- RF Stanchion Broadcast Assemblies (if applicable)
- RF Addressable Amplified Speakers (if applicable)
- Appropriate Radio Equipment (provided by others)

The communication medium between the Model IPE2500A Desktop Controller and the ITA2000A Tone Remote Adapter will be via a standard telephone pair. The output of the adapter will connect directly to the controlled base radio. 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)

Note that access from portable units within the system requires radios that are equipped with DTMF keypad (DTMF encode), if DTMF Selectable operation is programmed. For the purpose of any examples listed in this application document, DTMF Selectable operation is assumed.

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 Model GTG08081 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 IPE2500A Remote Deskset, ITA2000A Tone Remote Adapter (needed if the controlled base radio is not tone-ready), and a customer-provided base radio. The IPE2500A will provide the ability to access individual speakers or stanchions, system zones, or all units simultaneously for live voice broadcasting.

The Model IPE2500A Remote Deskset will be capable of generating selective voice broadcasts. Each stanchion or speaker assembly will be programmed for access via specific DTMF addresses (up to 8 addresses per stanchion assembly). The Remote Deskset 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. Broadcasting can occur with the handset on-hook or off-hook.

The Model IPE2500A Remote Deskset 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 speaker or stanchion unit. To broadcast a live voice message, the Deskset operator must select the zone/unit alias or enter the desired zone/unit code via the keypad, press and hold the TRANSMIT button (or handset pressbar), and begin speaking.

SYSTEM RADIO ACCES

The public address system can also be accessed for a live voice broadcast from anY existing VHF (154 - 174 MHz) or UHF (450 - 470 MHz) radio within the 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 and head-end operation previously mentioned will be utilized by these 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.

RADIO ACCESS INTERCONNECTION DIAGRAM

The Radio Access Interconnection Diagram depicts the signal flow and operation. The IPE2500A Remote Deskset communicates with the base radio, which will transmit the broadcast 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**).

IPE2500A Desktop Controller:
- Press and hold the TRANSMIT button or handset pressbar and enter the code **1001** via the keypad (will be seen in the LCD display)
- Begin speaking while continuing to hold the TRANSMIT button or handset pressbar
- Release the TRANSMIT button or handset pressbar when complete

Radio:
- Select the associated operating frequency on the radio
- Press and hold the PTT switch while entering the code **1001** via the keypad
- 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.