



GAI-TRONICS® CORPORATION  
A HUBBELL COMPANY

# S.M.A.R.T. ADA-Compliant Emergency Phones

## TABLE OF CONTENTS

**Getting Started..... 1**

**Product Overview ..... 1**

**Standard Operation..... 3**

    Placing an Emergency Call from a S.M.A.R.T. Phone (All Models Except 298-003HK1) ..... 3

    Placing a Non-Emergency Call using the Keypad (Models 294AL-003, 298-003, and 298-003HK1 Only) ..... 3

    Placing a Non-Emergency Call with AutoDial (Model 297-003TB1 Only)..... 3

    Receiving a Call..... 3

    Disconnecting Calls ..... 4

**Americans with Disabilities Act (ADA) Functionality..... 4**

    Call Received Indicator Lamp ..... 4

    Location Identification Code Dialing ..... 4

**Installation ..... 5**

**Safety Guidelines..... 5**

**General Installation Guidelines ..... 5**

    Tamper-Resistant Hardware ..... 5

    Conduit Installation Details ..... 6

**Model 293-003, 293AL-003, and 294AL-003 ..... 7**

**Models 297-003, 297-003TB1, 298-003 and 298-003HK1 ..... 9**

    Stanchion or Flush-mount Applications..... 9

**External Power..... 11**

**Connecting a Beacon..... 11**

**Setup ..... 12**

**Hardware Configuration..... 12**

    Auto-answer Configuration ..... 12

    Polarity Configuration ..... 12

**Auxiliary Output..... 13**

**Audio Level Adjustment..... 14**

**Programming ..... 14**

**Enter the Programming Mode..... 14**

**Basic Programming Commands..... 15**

    Auto-dial Memory ..... 15

    Automatic Line Level Compensation for Optimum Audio Performance ..... 16

    Call Time-out..... 17

***Maintenance*.....18**  
***Service* ..... 18**  
***Preventive Maintenance for Flush-mount Phones* ..... 18**  
        Cleaning ..... 18  
        Prevention ..... 18  
***Specifications* .....19**  
***Confidentiality Notice* .....21**



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# S.M.A.R.T ADA-Compliant Emergency Phones

## Getting Started

### Product Overview

Thank you for your purchase of a GAI-Tronics S.M.A.R.T., ADA-compliant, emergency telephone. In addition to providing standard emergency telephone operation, GAI-Tronics Self-Monitoring and Reporting Telephones (S.M.A.R.T.) incorporate leading-edge technology to provide optimum performance and flexibility. For example, when used with the GAI-Tronics Telephone Management Application (TMA) the health of each telephone is monitored and reported. For complete details, please refer to the on-line help included with TMA. The following S.M.A.R.T. telephone models are described in this manual:

Model	Description
<b>293-003</b>	<b>Emergency Phone</b> – This phone is housed in a safety yellow, glass-reinforced polyester enclosure that is designed to be surface-mounted and includes an emergency push button
<b>293AL-003</b>	<b>Emergency Phone</b> – This phone is housed in a cast aluminum enclosure painted safety yellow that is designed to be surface-mounted and includes an emergency push button.
<b>294AL-003</b>	<b>Emergency Phone with Keypad</b> – This phone is housed in a cast aluminum enclosure painted safety yellow that is designed to be surface-mounted and includes a 12-button Braille keypad, an emergency push button and a call (off-hook) button.
<b>297-003</b>	<b>Flush-panel Emergency Phone</b> – This is a flush-mount phone with a heavy-gauge brushed stainless steel front panel that includes an emergency push button.
<b>297-003TB1</b>	<b>Two-button Emergency Phone</b> – This is a flush-mount phone, with a heavy-gauge brush stainless steel front panel that includes an emergency push button, an assistance non-emergency push button, Braille tag, and visual call received indicator.
<b>298-003</b>	<b>Flush-panel Emergency Phone with Keypad</b> – This is a flush-mount phone with a heavy-gauge brushed stainless steel front panel that includes a 12-button Braille keypad, an emergency push button, and a call (off-hook) push button.
<b>298-003HK1</b>	<b>Flush-panel Hands-free Phone with Keypad</b> – This is a flush-mount phone with a heavy-gauge brushed stainless steel front panel that includes a 12-button Braille keypad and a call (off-hook) push button. <b>NOTE: The 298-003HK1 is not an ADA-compliant device.</b>

All of the S.M.A.R.T. emergency telephones listed above (except 298-003HK1) comply with the Americans with Disabilities Act (ADA). Each phone includes a Braille tag for vision-impaired individuals to identify the functions of the telephone and a visual indication for hearing-impaired individuals indicating that an emergency call has been answered.

The CALL RECEIVED WHEN LIT LED is the visual call received indicator. When a call is initiated by pressing the emergency push button, the LED will initially flash. When the telephone is answered and audio is detected, the LED will light steadily. The LED will remain lit until the call is disconnected.

**NOTE:** This feature does not apply to the Model 298-003HK1.

The GAI-Tronics S.M.A.R.T. Phone product line provides the flexibility to address a diverse range of applications. A wide variety of functions can be achieved by altering the configuration data stored in the phone's non-volatile memory. These configuration options include:

- Pre-programmed auto-dial telephone numbers
- Call termination method (automatic or manual)
- Maximum call duration
- Answering options

These functions are initially programmed during manufacturing and testing. After installation, they can be programmed remotely via DTMF data calls, either manually or through TMA. Set the emergency auto-dial phone numbers in accordance with your security plan. For most applications, the other function settings will not need to be changed from their factory defaults. For details regarding configurable options and the factory defaults, please refer to the "Programming" section of this manual and the on-line help available with TMA.

The emergency push button can be programmed to call three unique telephone numbers. The unique telephone numbers include a primary telephone number and two backup, or roll over numbers. In the event an emergency call cannot connect to the primary telephone number (i.e., a busy signal or no answer), the emergency phone will automatically dial the first backup, or roll over number. Again, in the event an emergency call cannot connect to first backup telephone number, the emergency phone will automatically dial the second backup, or roll over, number. This sequence will continue either until the emergency call is answered or the programmed number of retries is reached.

All S.M.A.R.T. telephones are line-powered and can be connected to any of the following:

- Central Office (CO) line to the Public Switched Telephone Network (PSTN)
- 24 V dc or 48 V dc analog station port of Private Branch Exchange (PBX), Private Automatic Branch Exchange (PABX) or KSU.

Connection may not be made to pay phone extensions or shared service (party) lines.

The phones require a minimum line current of 24 mA to operate. However, when available line current is below 35 mA, depending on the stability of the telephone line, the telephone's operation can be affected. To minimize the effects of lower line current, GAI-Tronics offers a plug-in power supply, Model 40404-045. Please refer to General Installation Guidelines.

TMA users can schedule auto-dial maintenance calls to alert maintenance personnel of any unusual sensor or fault conditions that exist. S.M.A.R.T. Phones can also be programmed to generate an auto-dial maintenance call when certain sensor events are discovered. Access to the S.M.A.R.T. Phone's maintenance mode is restricted through the use of the maintenance access PIN. The maintenance access PIN should be distributed only to trained maintenance personnel.

## Standard Operation

There are four types of telephones described in this manual. The first includes a single emergency push button, the second includes an emergency push button, a call push button, and telephone keypad, the third includes an emergency push button and assistance push button, and the fourth is a hands-free keypad telephones. The description of the operation of these phones is listed below.

### Placing an Emergency Call from a S.M.A.R.T. Phone (All Models Except 298-003HK1)

1. Press the **EMERGENCY** push button to place an immediate call to a preprogrammed emergency number, typically a security office or 911.
2. As the factory default, the **CALL RECEIVED WHEN LIT LED** will light steady when the phone detects sound (i.e., “Hello, Security....”).
3. As an alternate operation, the emergency phone can be configured to require action to light the **CALL RECEIVED WHEN LIT LED**. If this mode is configured, when the answering party answers the call and presses **#** (or **\***) to acknowledge the call, and the **CALL RECEIVED WHEN LIT LED** will light.

### Placing a Non-Emergency Call using the Keypad (Models 294AL-003, 298-003, and 298-003HK1 Only)

The phone models with keypads can also be used to make non-emergency type calls as follows:

1. Press the **CALL** push button.
2. Wait for dial tone.
3. Use the keypad to dial the desired number.
4. At the end of the conversation, press the **CALL** push button again to put the phone on-hook.

**NOTE:** The **CALL** push button can be configured to auto-dial, which overrides keypad dialing.

### Placing a Non-Emergency Call with AutoDial (Model 297-003TB1 Only)

1. Press the **ASSISTANCE** push button to place a call to a preprogrammed assistance number.
2. As the factory default, the **CALL RECEIVED WHEN LIT LED** will light steady when the phone detects sound (i.e., “Hello, Security....”).
3. As an alternate operation, the emergency phone can be configured to require action to light the **CALL RECEIVED WHEN LIT LED**. If this mode is configured, when the answering party answers the call and presses **#** (or **\***) to acknowledge the call, and the **CALL RECEIVED WHEN LIT LED** will light.
4. At the end of the conversation, press the **ASSISTANCE** push button again to put the phone on-hook.

### Receiving a Call

When a S.M.A.R.T. emergency telephone is called, the phone will automatically go off-hook and a conversation can take place (after the phone generates a pair of triple beep tones).

## Disconnecting Calls

There are several methods included in the S.M.A.R.T. emergency telephones to disconnect calls. There are both manual and automatic disconnect methods. The disconnect methods include the following:

- Remotely disconnect of an emergency call, operator enters either the ## or \*99 control command.
- Manually disconnect an emergency call, press the EMERGENCY button after 15 seconds (can be disabled).
- Manually disconnect a non-emergency call, press the CALL or ASSISTANCE button a second time.
- Automatically disconnect;
  - All calls, loop current drop disconnect.
  - All calls, maximum call duration timeout (configurable from 1 minute to 4 ½ hours)
  - Emergency and incoming calls, call progress tones (dial tone, busy signal, fast busy (or reorder tone))

For factory defaults and available options, please refer to the “Programming” section of this manual.

## Americans with Disabilities Act (ADA) Functionality

### Call Received Indicator Lamp

The CALL RECEIVED WHEN LIT lamp indicates to hearing-impaired individuals that the emergency call has been answered. When the individual presses the emergency push button, the person receiving the call (typically the security operator) presses the \* DTMF button. The telephone detects the \* DTMF signal and illuminates the CALL RECEIVED WHEN LIT lamp.

### Location Identification Code Dialing

The Location Identification Code feature enables security personnel to quickly and easily locate an individual in trouble. When the individual presses the EMERGENCY push button, the person receiving the call (typically the security operator) presses the \* DTMF button. The telephone detects the \* DTMF signal and transmits a three-digit location identification code to identify which emergency telephone is originating the call. This location code can be displayed on a DTMF decoder device (not supplied).

# Installation

**ATTENTION**

Installation should be performed by qualified personnel and only in accordance with the National Electrical Code or applicable local codes.

## Safety Guidelines

When installing any GAI-Tronics telephone equipment, please adhere to the following guidelines to ensure the safety of all personnel:

- Do not install telephone wiring during a lightning storm.
- **Electrostatic Discharge (ESD) Protection:** Your telephone may have an earth ground terminal provision. If so, ensure that it is connected to ground in accordance with all local safety regulations and the National Electrical Code (NEC). Grounding has to be ensured for safe and stable communications. Do not use long and coiled ground wires. Trim ground wires to the required length. Use a star configuration whenever possible. Please note proper grounding does not eliminate the need for lightning protection for the telephone or the telephone system.
- **Install a UL Listed lightning arrestor** on any phone installed where the phone or phone cable is at risk of being exposed to lightning strikes. The lightning arrestor must be installed as close to the phone as possible to maximize the protection. It must not be installed within the enclosure supplied with the phone. Please consult our Service Center at 800-492-1212 for further information.
- Do not install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Do not touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

## General Installation Guidelines

GAI-Tronics S.M.A.R.T. phones are designed to operate on telephone lines as detailed in the “Product Overview” section of this manual. The telephones are designed to operate with one telephone per line. If telephones are operated in parallel or “party line configuration” you may experience sporadic phone operation, difficulties with programming, or premature disconnection of calls. Additionally, if special features, e.g. voice mail, call waiting, etc, are not disabled, the phone may not function.

### Tamper-Resistant Hardware

All of the telephones described in this manual are vandal resistant. The front panel for each telephone covered in this manual is attached to its enclosure with tamper-resistant screws. A GAI-Tronics Model 233-001 Tamper-Resistant Screwdriver (sold separately) is recommended for installing the tamper-resistant screws.

Conduit Installation Details

GAI-Tronics recommends installing telephone lines in conduit to protect against accidental damage and vandalism. To prevent moisture from entering the enclosure, we strongly recommend the following:

- Conduit should enter the enclosure from the bottom.
- Sealed fittings should be installed at all cable entry points.
- Silicone sealant or equivalent should be applied around and inside all conduit entries.

Please refer to the examples below for the recommended conduit installation details.

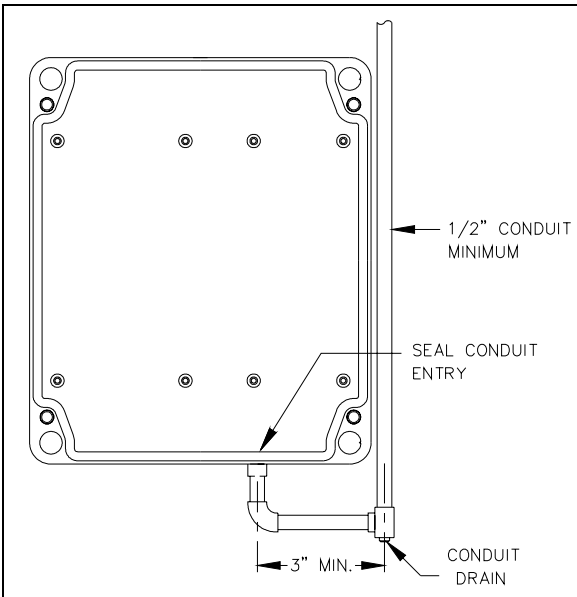


Figure 1. Bottom entry conduit recommended for non-metallic enclosures

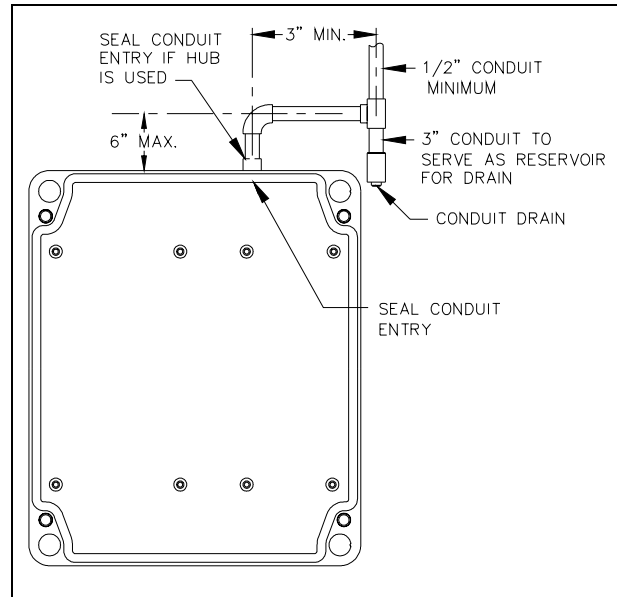


Figure 2. Top entry conduit installation for non-metallic enclosures (NOT recommended)

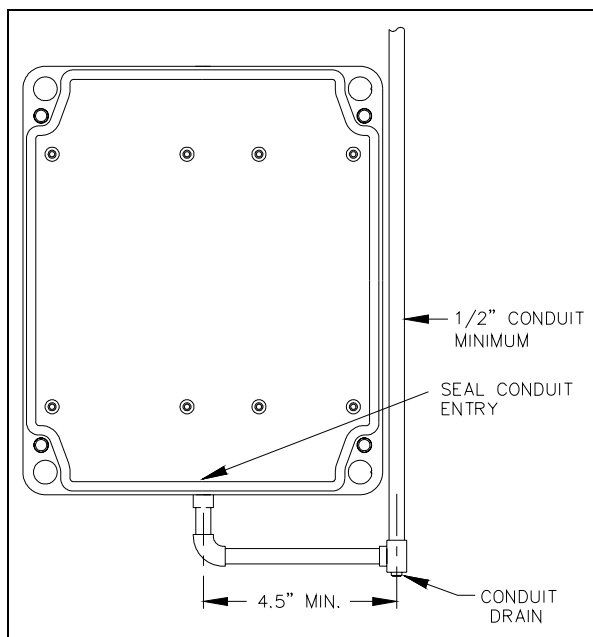


Figure 3. Bottom entry conduit installation details for metallic enclosures

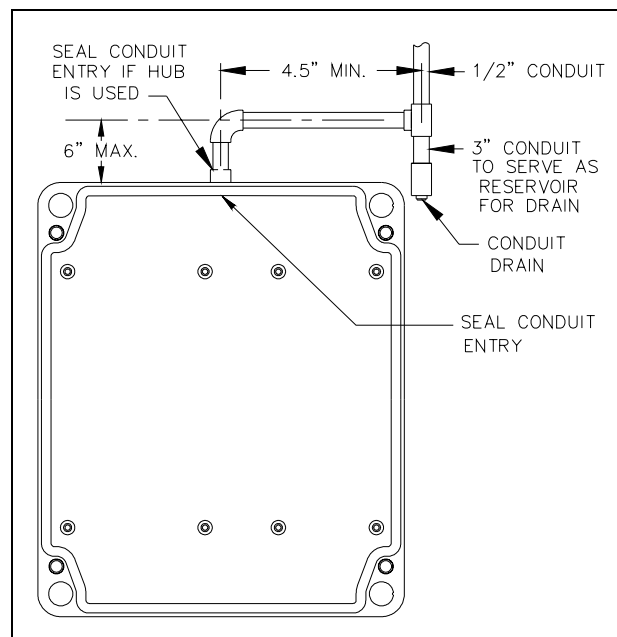


Figure 4. Top entry conduit installation details for metallic enclosures (NOT recommended)

## Model 293-003, 293AL-003, and 294AL-003

The mounting and wiring instructions for Models 293-003, 293AL-003 and 294AL-003 are as follows:

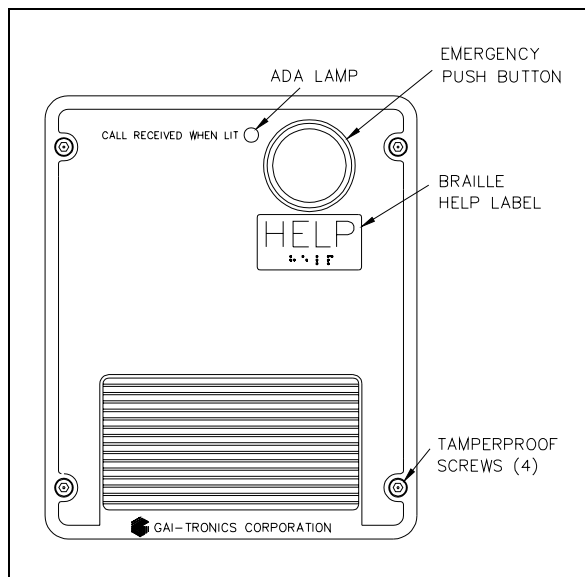


Figure 5. Model 293-003 Emergency Phone in a Non-Metallic Enclosure

1. Remove the four tamper-resistant screws from the front panel.
2. Position the enclosure on the mounting surface. The enclosure provides four 0.28-inch mounting holes. Secure it with the four ¼-inch diameter bolts of the appropriate length for the mounting surface.  
**NOTE:** When using the GAI-Tronics Model 231-001 Pole Mounting Kit, follow the mounting instructions provided in the kit.
3. For Model 293-003 only: Create an access hole using a Greenlee-type punch that is equivalent in size to the conduit diameter. Bottom entry is strongly recommended. Insert a conduit fitting in the access hole. Refer to conduit installation details on page 6.  
**NOTE:** Use silicone sealant or equivalent around and inside all conduit entries.

4. Pull the telephone line through the conduit. Connect the telephone line to the customer-supplied telephone line surge suppressor (if applicable) and modular jack.
5. Connect the telephone's modular plug to a USOC RJ11 or CA11A (Canada) modular jack.  
**NOTE:** A modular jack may be mounted inside the telephone. Telephone line connections directly to TB1 are acceptable.
6. Using the "Setup" section of this manual,
  - Make hardware configuration changes.
  - Adjust the audio levels if necessary.
  - Perform the initial programming.
7. Verify operation by calling to and from another phone.
8. Complete the installation by attaching the front panel assembly to the rear enclosure using the four tamper-resistant screws.

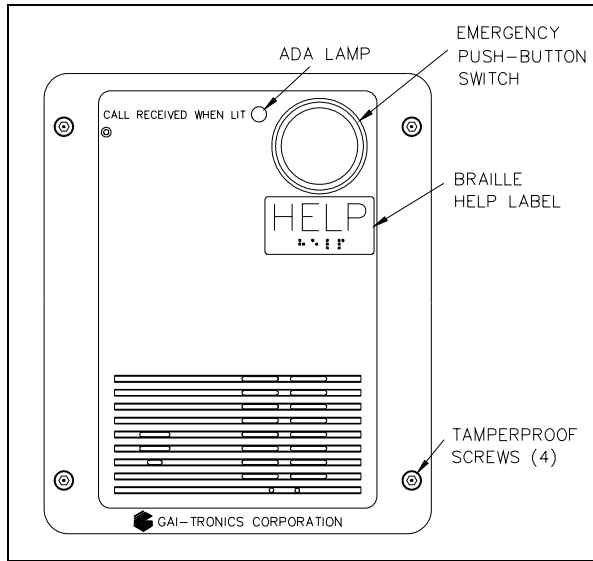


Figure 6. Model 293AL-003

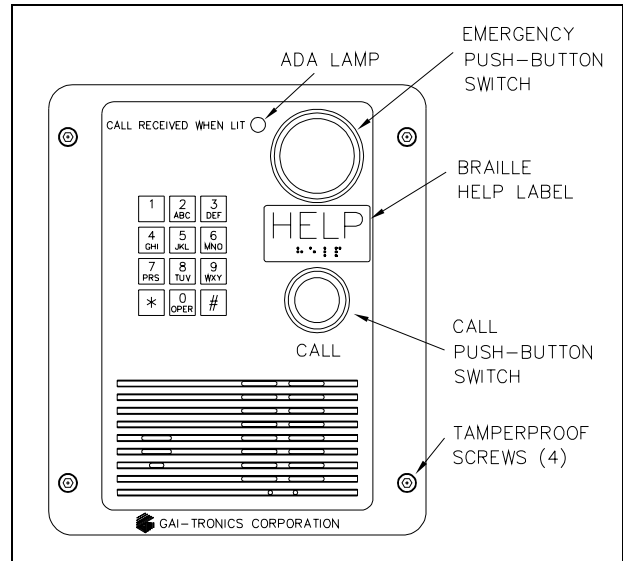


Figure 7. Model 294AL-003

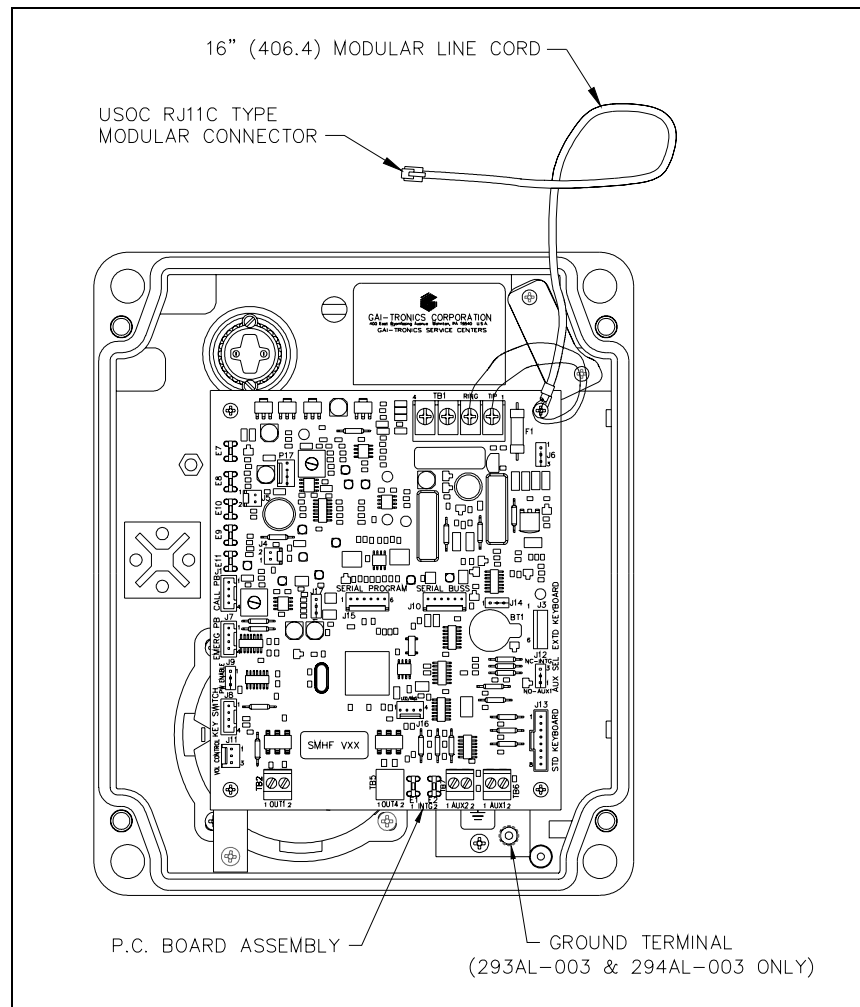


Figure 8. Model 293-003, 293AL-003, and 294AL-003 Component Locations

Models 297-003, 297-003TB1, 298-003 and 298-003HK1

Stanchion or Flush-mount Applications

1. When mounting in a GAI-Tronics Model 234 Series Stanchion, or for flush-mount installations, the supplied back box must be used to mount the Model 297-003, 297-003TB1, 298-003, or 298-003HK1 Telephone. Mount the back box to the structure using the appropriate hardware. Refer to Figure 13 cutout dimensions.

**NOTE:** If mounted outdoors, the installation of a telephone line suppressor (customer-supplied) on the telephone line is recommended.

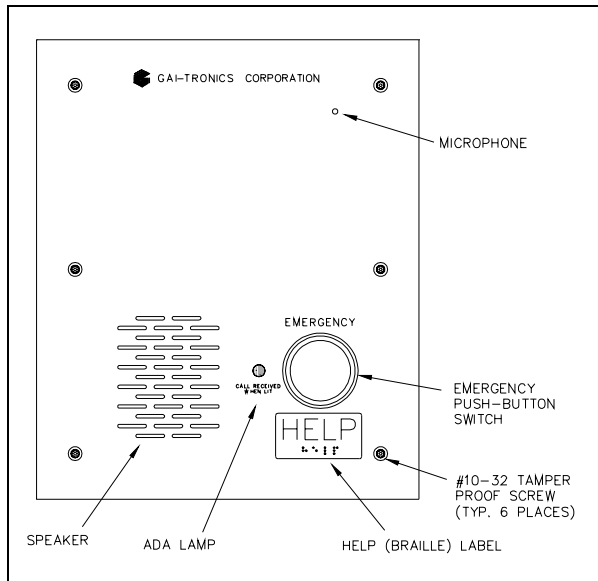


Figure 9. Model 297-003

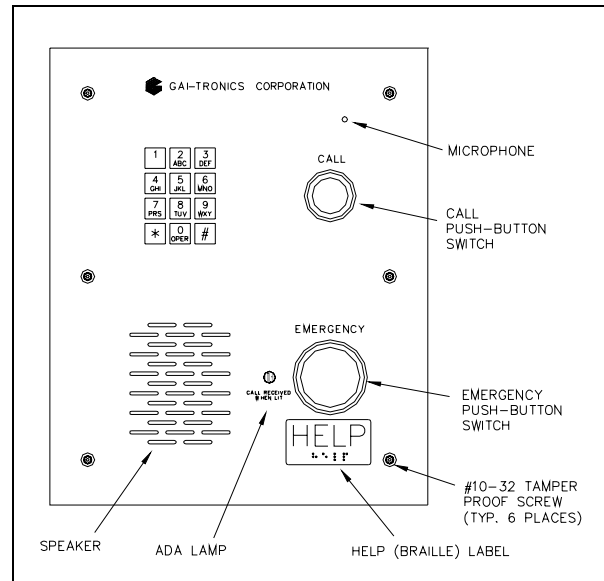


Figure 10. Model 298-003

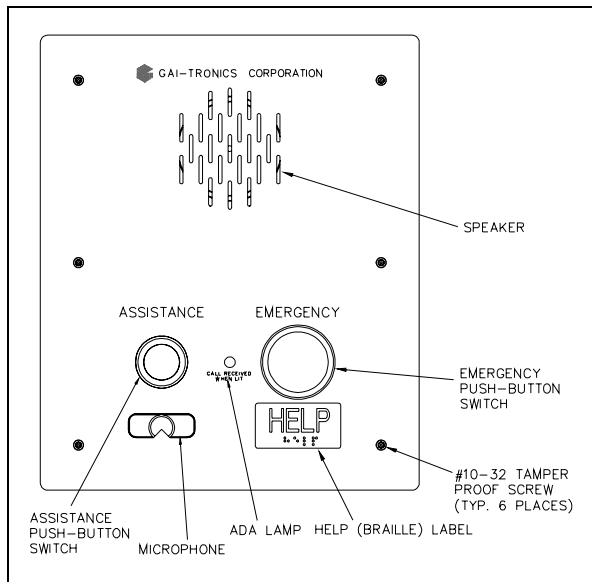


Figure 11. Model 297-003TB1

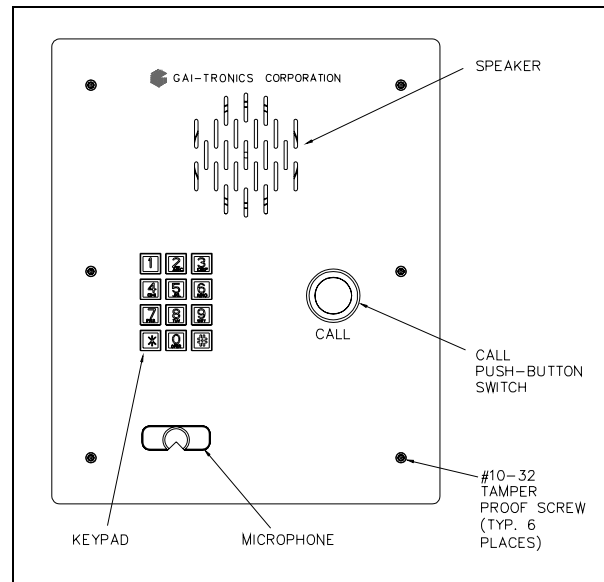


Figure 12. Model 298-003HK1

2. Remove the tapered plug from the top or bottom cable entry hole in the back box, and install the telephone line and cable fitting.

**NOTE:** Telephone line connections directly to TB1 are acceptable.

3. If using the modular jack, remove the cover, and connect the red and green wires of the telephone line to the red and green wires of the modular jack. Replace the modular jack cover.
4. Connect the telephone's modular plug to a USOC RJ11 or CA11A (Canada) modular connector or (if applicable) the telephone line suppressor. Refer to Figure 8. Model 293-003, 293AL-003, and 294AL-003 Component Locations for the Model 297-003, 297-003TB1, 298-003 and 298-003HK1 component locations.
5. Using the "Setup" section of this manual,
  - Make hardware configuration changes. See the "Hardware Configuration" section on page 12 for details.
  - Adjust the audio levels if necessary. See the "Audio Level Adjustment" section on page 14 for details.
  - Perform the initial programming. See the "Programming" section on page 14.
6. Verify operation by calling to and from another phone.
7. Complete the installation by attaching the front panel assembly to the rear enclosure mounting flanges using the six supplied #10-32 tamper-resistant screws and washers.

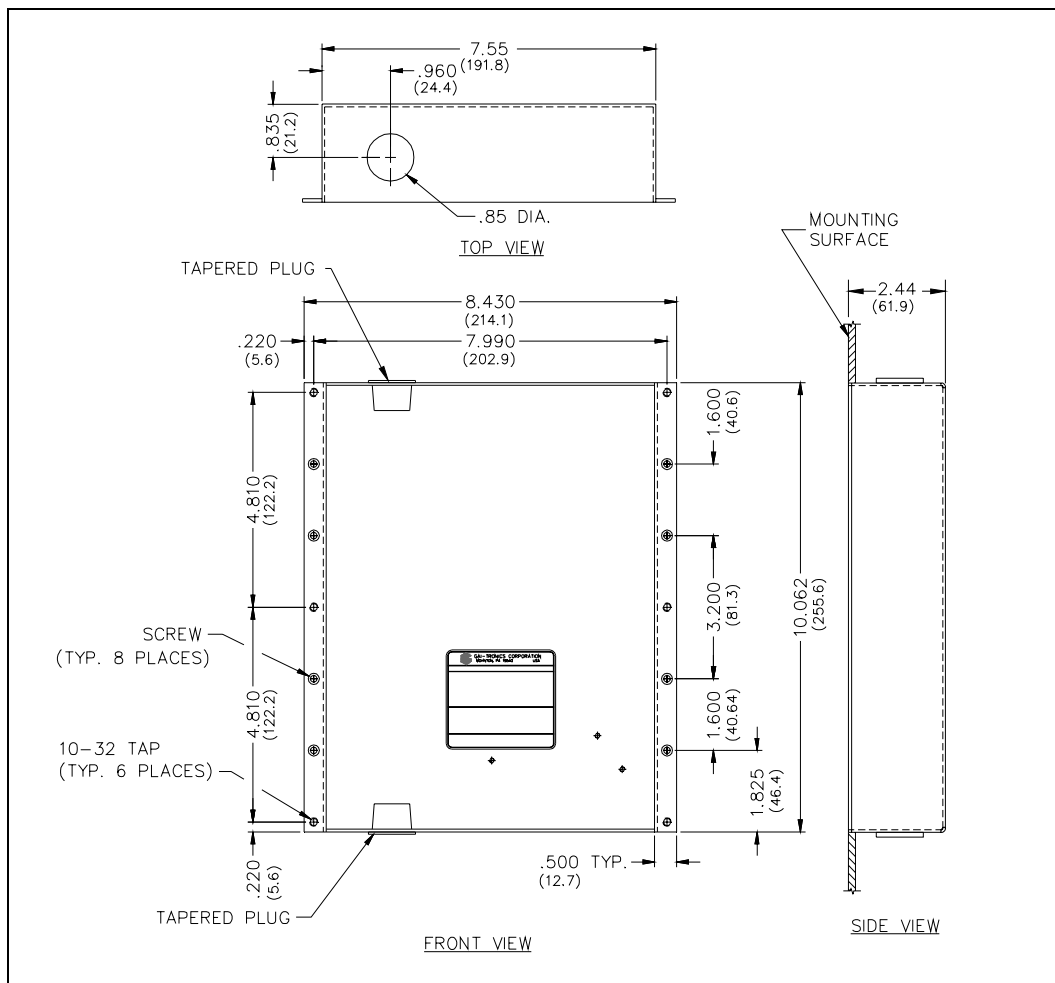


Figure 13. Model 297-003, 297-003TB1, 298-003 and 298-003HK1 Mounting Details

## External Power

The Model 40404-045 Plug-in Power Supply is available (sold separately) to provide an increase in the emergency phone's speaker output. The 40404-045 requires 120 V ac input and provides a 5 V dc output to the unit's speaker amplifier circuits. The 40404-045 is provided with a connectorized, 4-foot power cable that plugs into P17 on the telephone PCBA. After installing the 40404-045 power supply, use the modified line level programming command \*788# to provide optimum speaker volume. Refer to "Automatic Line Level Compensation" in the "Programming" section.

**NOTE:** The 40404-045 is required only when setting the normal speaker volume to maximum does not produce the desired results or if available telephone line current falls below acceptable results.

## Connecting a Beacon

Figure 14 below shows a typical connection detail of the GAI-Tronics 530-001/531A Beacon (sold separately).

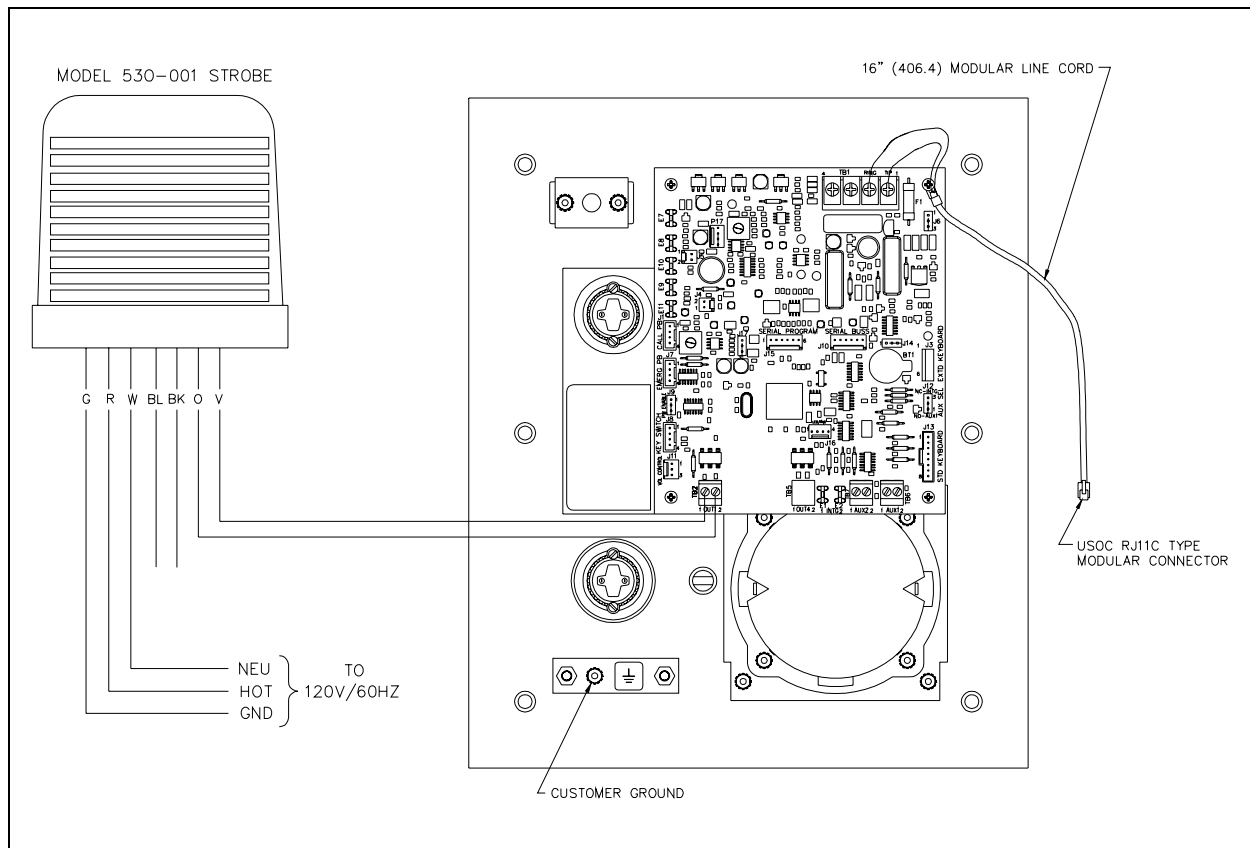


Figure 14. (Model 298-003 is shown as an example)  
 Connection to Optional GAI-Tronics 530-001/531A Beacon

# Setup

## Hardware Configuration

The hardware configuration options are explained in detail in the following sections, and the necessary jumper settings are identified to enable or disable each option. We recommend reading each section, recording the selected options, making the necessary changes, and creating a record of your settings. See Figure 15 on page 13 for the jumper locations.

### Auto-answer Configuration

*Factory Setting:* Auto-answer feature enabled

The Auto-answer feature enables or disables the automatic answering of an incoming call, which allows TMA to monitor the health of this phone via polling. When the Auto-answer feature is enabled, the phone automatically answers the call and attempts to communicate with TMA. If the caller is not TMA, the telephone automatically transitions to a standard two-way communication.

*Enable:* Insert the J14 jumper on pins 2 and 3.

*Disable:* Insert the J14 jumper on pins 1 and 2 (Do not use this setting except under the direction of GAI-Tronics personnel.)

**NOTE:** The Auto-answer feature must be enabled during remote programming, and to allow the GAI-Tronics Telephone Management Application PC to contact the phone.

### Polarity Configuration

*Factory Setting:* Non-polarity sensitive

This telephone can be configured to be polarity or non-polarity sensitive. With the non-polarized setting, the telephone operates regardless of tip and ring polarity. With the polarized setting, the telephone only operates with the telephone line's positive terminal connected to the tip. Use the Polarity Sensitive setting to allow a line voltage reversal disconnect signal to disconnect the call.

*Non-polarity Sensitive:* Insert the J6 jumper on pins 2 and 3.

*Polarity Sensitive:* Insert the J6 jumper on pins 1 and 2.

## Auxiliary Output

Each telephone includes one isolated solid state switch capable of switching a maximum of 48 V dc, 125 mA or 28 V<sub>RMS</sub> ac, 80<sub>RMS</sub> mA. TB2 (OUT1) on the emergency phone PCBA provides the connections for the auxiliary output. Refer to Figure 15 for the location of TB2.

The auxiliary output allows peripheral equipment, such as beacons, video cameras, and alarm generators, to be activated when the EMERGENCY push button is pressed. The relay remains energized for the duration of the emergency call.

In many applications, the auxiliary output is used to operate a GAI-Tronics Model 530-001/531A Beacon (sold separately). For connection details, please refer to the Model 530-001/531A installation bulletin included with the beacon. Information is also available at [www.gai-tronics.com](http://www.gai-tronics.com).

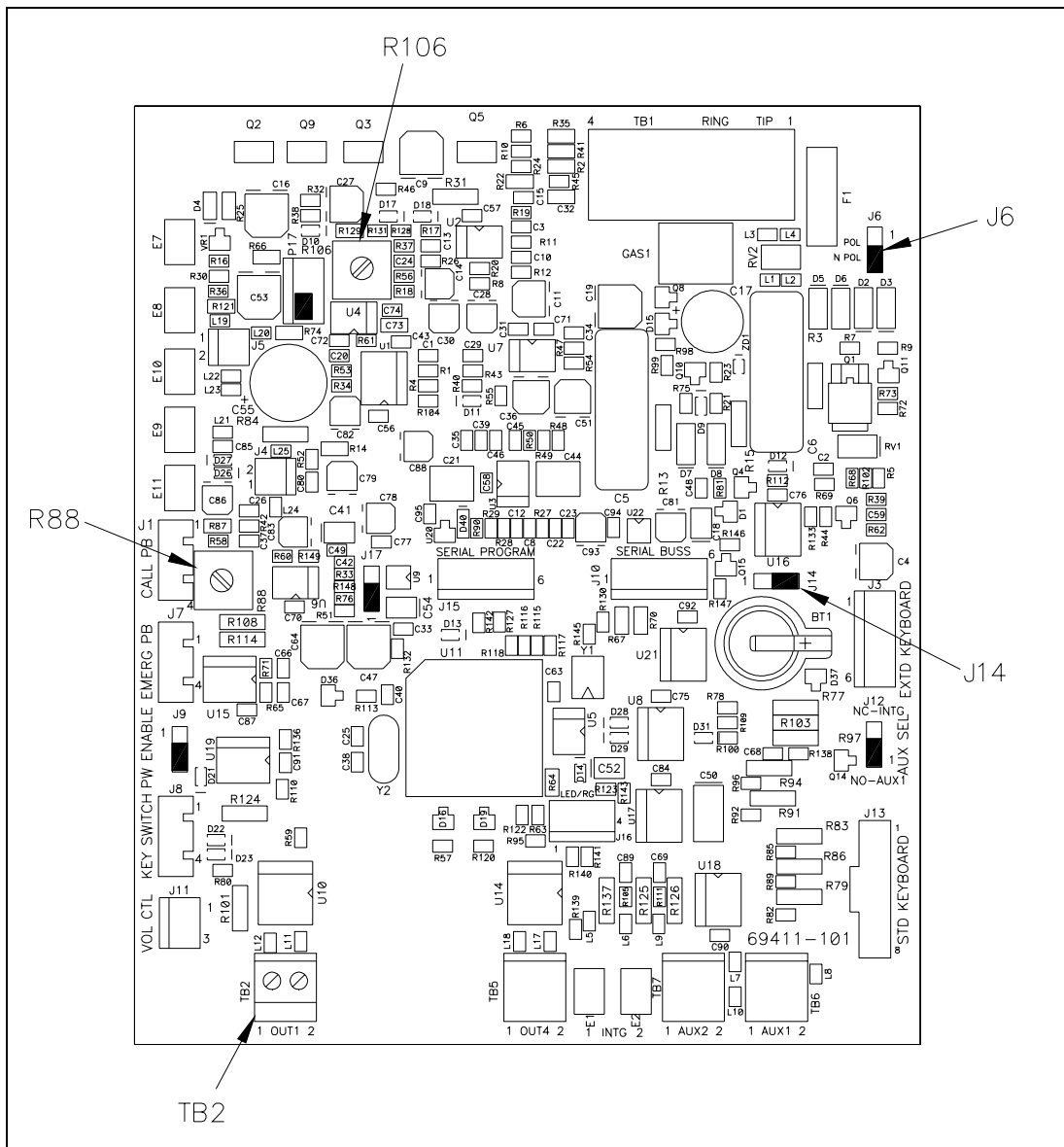


Figure 15. Emergency Phone PCBA

## Audio Level Adjustment

The speaker volume and microphone sensitivity are factory set to nominal levels that are acceptable for most installations. However, some installations may require adjustments for the speaker and microphone. Both the speaker and microphone adjustments are made using potentiometers on the emergency phone PCBA. R106 is the speaker volume adjustment, and R88 is the microphone sensitivity adjustment. Refer to Figure 7 for the potentiometer locations.

After making any adjustments to the audio levels, perform the automatic line level compensation as detailed in the “Programming” section of this manual.

When the phones leave the factory, the microphone potentiometer is set near minimum, and the speaker pot is set to maximum. The speaker volume potentiometer (R106) provides 6 dB range of adjustment and the microphone sensitivity potentiometer (R88) provides 12 dB range of adjustment.

Special care must be given to adjusting the speaker volume and microphone level. If one or both of the levels are set too high, acoustic feedback (howling) can occur. If acoustic feedback occurs, we recommend returning both potentiometers to the nominal factory settings and beginning the adjustment again from this point.

Additionally, the acoustic characteristics of the emergency phones are different both when the front panel is removed from the enclosure and when the front panel is tightly mounted in the enclosure. After making any volume adjustments, we recommend mounting the front panel to the enclosure and again testing the phone.

## Programming

All S.M.A.R.T. Phone models are programmable. The phone settings are initially programmed during manufacturing and testing. Factory default settings can be found in Table R-1. The following section provides instructions for programming basic features needed to initially set up the phone from another touch-tone phone.

We recommend using a handset phone exclusively when programming the S.M.A.R.T. phone remotely. If a speakerphone is used for programming, the background noise can lead to incorrect settings. A cell phone is also not recommended.

TMA is required to access many of the programmable features of the emergency telephones. For programming using TMA, refer to the on-line help provided with the software, or contact the GAI-Tronics Field Service Department.

Use the TMA Memory Bank 1 to set up the emergency auto-dial numbers. Use Memory Bank 2 to set up the assistance auto-dial numbers for the Model 297-003TB1

## Enter the Programming Mode

Read the entire “Programming” section and carefully plan your programming before beginning the process. For each setting that will be changed, we recommend writing down the key sequence from the *Command* column of **Table R-1, Basic Programming Commands**. Having the programming information written down allows you to enter the key sequence at a steady pace. This is important because the programming sequence times out if there is a pause of more than 5 seconds during the programming sequence.

Complete the following steps to enter the programming sequence from a remote DTMF telephone:

1. Call the telephone to be programmed. (Do not use a cellular phone.)
2. Listen for a confirmation tone during ringing, which signals that the telephone has answered.
3. Press \*\*\* to enter the programming mode.
4. Wait two seconds.
5. Enter **\*\*0000** (0000 is the factory default maintenance PIN #.)
6. Enter **\*20**. If the phone has successfully entered into the maintenance mode, the phone will respond with six DTMF digits. If access to the maintenance mode is denied, the phone will respond with two DTMF digits. If access is denied, repeat steps 5 and 6 to again request access.
7. Complete the desired programming. Refer to the “Basic Programming Commands” section for options.
8. Listen for a confirmation tone at the end of each programming sequence, which indicates the programming change was accepted.
9. When finished programming, press **\*99** to exit the programming mode.

## Basic Programming Commands

The following programming commands can be entered from any touch-tone telephone. Acceptance of data transfer commands is indicated via a return code transmitted as an audible DTMF tone.

### Auto-dial Memory

When the EMERGENCY (or ASSISTANCE) button is pressed, the S.M.A.R.T. Phone dials a pre-programmed telephone number (the primary number). If the call cannot connect (line busy, no answer), the phone will redial using the first backup (roll-over) number. If again the call cannot connect, the phone will redial using the second backup (roll-over) number. This sequence will continue until either the call is answered, or the programmed number of retries is reached.

Use the **\*1** command to program these three (or six) auto-dial numbers. The three auto-dial telephone numbers for the EMERGENCY button are labeled as 11 (primary), 12 (first roll-over), and 13 (second roll-over) and are shown as Memory Bank 1 in TMA. You can program these for three different numbers, or set them to the same telephone number.

The three auto-dial telephone numbers for the ASSISTANCE button are labeled as 14 (primary), 15 (first roll-over), and 16 (second roll-over), and are shown as Memory Bank 2 in TMA.

Each auto-dial memory storage location accommodates up to 24 characters.

To enter the auto-dial number into memory storage, or to change the number in storage, enter **\*11<N><CHAR>#**

<b>*1</b>	Data transfer command
<b>1&lt;N&gt;</b>	Auto-dial memory location (N = 1, 2, and 3) for emergency push button; N = 4, 5, and 6 for assistance or call push button.
<b>&lt;CHAR&gt;</b>	Telephone number to be stored in memory location (up to 24). Valid entries are 0-9 and the following 2-digit codes: *1 provides a 0.6-second pause in the dialing sequence, *2 provides a DTMF #, and ** provides a DTMF *.
<b>#</b>	End-of-string indicator

The command \*1115551212#, for example, sets the EMERGENCY button primary number to 555-1212.

After each auto-dial memory storage location is successfully programmed, the phone returns a system-generated DTMF check-digit.

If the phone is installed on a ring down telephone line, clear the first auto-dial memory using the command \*111#.

#### Automatic Line Level Compensation for Optimum Audio Performance

Every telephone line has different audio and electrical characteristics. To accommodate the varying lines, the telephone has an automatic line level compensation function. When a telephone is first installed and connected to a telephone line, we recommend initiating the automatic level compensation feature. The automatic line level compensation is initiated in the programming mode with the \*78 command, as follows:

<b>*787</b>	Data transfer command
<b>#</b>	End-of-string indicator

After the \*78 command is successfully entered, the phone returns a system-generated DTMF check-digit.

To complete the automatic line level compensation, when programming is completed and the phone placed back on-hook, the following process must be followed:

#### For single button emergency phones:

1. Remove the phone from the back box or enclosure.
2. Disconnect the emergency push button from J7, the “Emerg PB” socket on the phone PCBA.
3. Connect the emergency push button to J1, the “Call PB” socket on the phone PCBA. Press the emergency push button. When dial tone is steady (with no volume variations), the process is complete. Depending on the phone line and the duration dial tone, it may be necessary to repeat this step one or more times.
4. Disconnect the emergency push button from J1, the “Call PB” socket on the phone PCBA.
5. Reconnect the emergency push button to J7, the “Emerg PB” socket on the phone PCBA.
6. Install the phone in the back box or enclosure.

**For emergency phones and hands-free keypad phones having a call push button and keypad:**

Press the call push button. When dial tone is steady (with no volume variations), the process is complete. Depending on the phone line and the duration dial tone, it may be necessary to repeat this step one or more times.

**For two-button emergency phones:**

Determine the phone number that the ASSISTANCE button will autodial. (This is the phone number stored in memory location 14, the primary number.) Temporarily clear this memory location either through TMA (the first number in Bank 2) or by manually programming with the write memory command \*114#.

Press the ASSISTANCE button. When the dial tone is steady (with no volume variations), the process is complete. Depending on the phone line and duration of dial tone, it may be necessary to repeat this step one or more times.

After putting the phone on-hook by re-pressing the ASSISTANCE button, again program the phone either with TMA or manually to restore the desired phone number for the ASSISTANCE button (primary number, memory location 14).

## Call Time-out

The call time-out feature is used to limit the maximum duration of a call. The call time-out can be any duration between one minute and 4½ hours. The duration is set in ½ second increments and the valid range is from 120 to 32,400. To determine the value associated with a specific time duration, see the example below.

<b>*37</b>	Data transfer command
<b>&lt;120~32400&gt;</b>	Call duration (120 to 32400 ½ seconds) – See example below.
<b>#</b>	End of string indicator

## Example:

To determine what to enter for the call time-out duration, multiply the desired time limit, in minutes, by 120. For example, to determine the call duration entry for a call time-out of 5 minutes, do the following:

$$5 \text{ minutes} \times 120 = \mathbf{600}$$

To enter a call time-out duration of 5 minutes, enter the character string **\*37600#**.

When the call time-out duration has been successfully entered, the phone returns a system-generated DTMF check-digit.

Table R-1. Basic Programming Commands

Command:	Factory Default:	Description:
<b>*1NN &lt;CHARAC&gt;#</b>	N/A	Write Memory NN (11–16) with characters (up to 24)
<b>*787#</b>	7	Initiate automatic level compensation
<b>*37&lt;120~32400&gt;#</b>	840	Write Call Time-out (120–32400 × ½ sec). Factory default is 840, or 7 minutes.
<b>*821#</b>	N/A	Turn on the relay output (OUT1)
<b>*921#</b>	N/A	Turn off the relay output (OUT1)
<b>*99</b>	N/A	End programming call. The S.M.A.R.T. phone hangs up.

## Maintenance

### Service

If your S.M.A.R.T. Phone requires service, contact your GAI-Tronics 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 will be made without charge. 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.

### Preventive Maintenance for Flush-mount Phones

Stainless steel does not normally require maintenance to prevent corrosion from occurring. Different installation locations may require more regular maintenance than others, depending on the environment and exposure to airborne contaminants. The following maintenance steps should be performed on a regular basis or when corrosion is first noticed on your Model 297-003, 297-003TB1, 298-003, or 298-003HK1.

#### Cleaning

- For general cleaning, wipe the surface with a cleanser or a cleanser and water mixture. Any cleanser that is safe for glass is usually safe for stainless steel. Wipe dry.
- If corrosion or rusting is noticed, remove with a non-abrasive commercial cleanser and water. Rub stained areas in the same direction as the existing grain. Stubborn stains may be removed with a magnesium oxide, ammonia, and water paste. Wipe clean with water rinse and dry.

#### Prevention

Automotive wax provides the best results in preventing corrosion on stainless steel. Simply apply wax, let dry to a haze, and buff to a shine with a clean dry cloth. This application should protect the telephone surface for many months as it will allow natural reformation of the chromium oxide layer.

**Do NOT use steel wool, sandpaper, mineral acids, bleaches, or chlorine cleansers on the stainless surface.**

## Specifications

TMA compatibility profile type.....	GTC S.M.A.R.T. Hands-free
Auto-dial digit limit .....	24 digits
Electrical	
Audio output .....	Voice - 80 dB SPL @ 1 meter with 40 mA loop current 1 kHz tone - 76 dB SPL @ 1 meter with 40 mA loop current
Input.....	24 V dc or 48 V dc
Phone line requirements.....	Loop start, central office (CO), or Analog station port (PBX, PABX, or KSU)
Minimum loop current .....	24 mA (35 mA recommended)
Auxiliary output (Isolated solid state switch) .....	48 V dc @ 125 mA 28 V <sub>RMS</sub> ac @ 80 mA <sub>RMS</sub>
Signaling .....	DTMF 100 ms tone
Memory.....	Non-volatile EEPROM
Mechanical	
Operating temperature range.....	-40° C to +60° C
Relative humidity.....	to 95%, no condensation

### Model 293-003

Enclosure construction.....	Valox (high impact, glass-reinforced polyester) painted safety yellow
Dimensions .....	9.5 H × 8 W × 4 D inches (241.3 × 203.2 × 101.6 mm)
Weight.....	4.0 lbs.

### Models 293AL-003 and 294AL-003

Enclosure construction.....	Cast aluminum painted safety yellow
(Model 294AL-003 only) Dial pad.....	Chrome-plated zinc
Dimensions .....	9.5 H × 8 W × 4 D inches (241.3 × 203.2 × 101.6 mm)
Weight	
Model 293AL-003 .....	7.8 lbs.
Model 294AL-003 .....	8.5 lbs.

### Models 297-003, 297-003TB1, 298-003, and 298-003HK1

Construction	
Panel .....	14-gauge, type 304 brushed stainless steel
Back box.....	16-gauge cold-rolled steel with black polyurethane finish
(Models 298-003 and 298-003HK1 only) Dial pad.....	Chrome-plated zinc
Dimensions	
Panel .....	12.0 H × 10.0 W inches (304.8 × 254 mm)
Back box (depth from mounting surface).....	2.38 inches (60.5 mm)
Panel cutout .....	10.1 H × 8.43 W inches (255.57 × 214.12 mm)
Weight	
Model 297-003 .....	6.5 lbs.
Model 297-003TB1 .....	6.5 lbs.
Model 298-003 .....	7.2 lbs.
Model 298-003HK1 .....	7.2 lbs.

Approvals

Safety of Information Technology Equipment ..... UL/CSA 60950

Enclosures for Electrical Equipment..... UL 50, Type 3R

47 CFR Part 68

Certification Number ..... US: ADGTE04B0414HAC

Ringer Equivalence Number ..... .4B

Network connection (USOC)..... RJ11

IC Information (Canada)

IC Certification Number ..... 882B-GTC S.M.A.R.T.

Ringer Equivalence Number ..... .4B

Connection Method..... CA11A

Replacement Parts

Part No.	Description	293 -003	293AL- 003	294AL- 003	297 -003	297- 003TB1	298 -003	298- 003HK1
233-001	Model 233-001 Tamper-Resistant Screwdriver	■	■	■	■	■	■	■
12562-103	PCBA Replacement Kit (S.M.A.R.T. Hands-free)	■	■	■	■	■	■	■
51035-005	PCBA, Keypad, metallic			■			■	■
28299-007	Tamperproof Screws (flush-mount models)				■	■	■	■
28229-004	Tamperproof Screws, 1-1/8 inch	■	■	■				
12520-006	Push Button Replacement Kit (1.5-inch, Red)	■	■	■	■	■	■	
12520-007	Push Button Replacement Kit Black			■		■	■	■
40404-045	Optional Plug-in Power Supply	■	■	■	■	■	■	■
12521-002	Microphone Replacement Kit	■	■	■				
12521-003	Microphone Replacement Kit				■	*	■	*
12522-006	Piezo Speaker Replacement Kit – 293/294	■	■	■				
12522-005	Piezo Speaker Replacement Kit – 297/298				■	■	■	■

\*Contact GAI-Tronics factory service.

## Confidentiality Notice

This manual is provided solely as an operational, installation, and maintenance guide and contains sensitive business and technical information that is confidential and proprietary to GAI-Tronics. GAI-Tronics retains all intellectual property and other rights in or to the information contained herein, and such information may only be used in connection with the operation of your GAI-Tronics product or system. This manual may not be disclosed in any form, in whole or in part, directly or indirectly, to any third party.

### User Instructions (USA)

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.

### User Instructions (Canada) CP-01, Issue 8, Part I: Section 14.1

**NOTICE:** The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document (s). The Department does not guarantee the equipment will operate to the user's satisfaction. Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations. Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment. Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

### CP-01, Issue 8, Part I: Section 14.2

**NOTICE:** The **Ringer Equivalence Number** (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Warranty Periods. 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.

Limitations / Exclusions. 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

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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.