



GAI-TRONICS® CORPORATION  
A HUBBELL COMPANY

# Model 7245-003

## 24 V DC Remote Subset Amplifier Enclosure

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### 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.

### General Information

The Model 7245-003 Indoor Remote Subset Amplifier Enclosure is an important component of the 700 Series Page/Party® system. It is constructed of fabricated steel, and is equipped with terminal strips for connecting inter-station cable and a 24-pin connector to accommodate one of three types of GAI-Tronics subsets. The GAI-Tronics Model 723-003 Amplifier plugs directly into this enclosure.

The Model 7245-003 Amplifier Enclosure must be mounted within 8 feet of the subset due to the subset cable limitations. In addition, it must be mounted at an indoor location - the amplifier enclosure is not designed for outdoor use.

### Installation

 **CAUTION**  **Do not install this equipment in hazardous areas or areas other than those indicated on the approval listing in the Specification section of this manual. Such installation may cause a safety hazard and consequent injury or property damage.**

When installing an add-on station, consult the 24 V dc system layout diagrams at the end of this manual. These figures, when used in conjunction with the station installation information and cable layout guide, should provide all the information necessary to install additional Page/Party® stations.

In 24-volt systems, plan on several branch lines from the dc source with no more than six stations per branch. One branch could span up to 4,000 feet for a single station. The Maximum Cable Distance Table lists the limits. Where two or more stations are listed, the assumption is that they are evenly spaced along the cable.

Each amplifier contains two fuses on the PCBA in the 24 V dc input to protect and isolate the handset and speaker amplifier circuitry in the event of a failure. Power line wiring to each amplifier or group of amplifiers should have a fuse or circuit-breaker to protect against wiring failures.

If cable with 14 AWG power line conductors is used, a 15-amp fuse or circuit breaker should be installed for each branch line at the point it connects to the battery. Fuse or circuit breaker rating is determined by the size cable used in the branch. Consult the National Electrical Code (NFPA70) or Canadian Standards Association (CSA 22.1) for the maximum allowable capacity of the wire used.

The GAI-Tronics 24 V dc series of Page/Party<sup>®</sup> system equipment is designed to operate from a 24 volt dc rechargeable battery. A battery charger may be connected to the battery to maintain the charge.

 **CAUTION**  **Under NO condition should this equipment be operated from a battery charger without the batteries connected.**

Most chargers have an unloaded output of 35 to 45 volts that can quickly damage the equipment designed for nominal 24 volts. To maintain a proper state of battery charge, the voltage across the batteries will be somewhat greater than 24 volts, but should never exceed 28.8 V dc. Grounding the negative side of the battery system at only one point is recommended and will ensure hum- and noise-free operation.

## Enclosure Placement

All GAI-Tronics Page/Party<sup>®</sup> units are wired in parallel. Good system layout design minimizes the cable required for each installation. GAI-Tronics multi-conductor cable, designed especially for this application, is recommended. The number, size, and color-coding of conductors are listed in the accompanying system connection diagrams.

System layout and power cable length are important considerations when installing Page/Party<sup>®</sup> equipment. Consult the Maximum Cable Distance table for typical cable lengths. The cable distance between stations as well as total cable distance must be considered. Cable distance is more strictly regulated in 24 V dc systems because of the amount of resistance these cables encounter—the longer the cable distance, the greater the resistance and IR losses (voltage drop) encountered.

Maximum Cable Distance in Feet\*

Number of Units	14 AWG Total/Between	12 AWG Total/Between	10 AWG Total/Between	8 AWG Total/Between
1	4,000/4,000	6,400/6,400	10,000/10,000	16,000/16,000
2	2,800/1,400	4,480/2,240	7,000/3,500	11,200/5,600
3	2,000/660	3,200/1,060	5,000/1,667	8,000/2,667
6	1,200/200	1,920/320	3,000/500	4,800/800
9	800/90	1,280/142	2,000/222	3,200/356

\*Based on the following assumptions:

- GAI-Tronics-supplied cable is used.
- Speech signals (Speech signals do not have the energy content of a continuous tone, and therefore do not require as much average current.) **NOTE:** With continuous tone signals, each station is driven to 12 watts and the distances stated should be reduced by half, or ideally one fourth, to minimize signal distortion.
- Wire resistance (ohms) is the nominal value for the applicable AWG at 1,000 feet of bare copper, stranded wire @ 20° C (68° F). Wire resistance values used are as follows:  
14 AWG = ~2.525 ohms; 12 AWG = ~1.588 ohms; 10 AWG = ~0.999 ohm; 8 AWG = ~0.628 ohm
- DC V at cable run’s feed point = ~26.6 V dc
- DC V at the last unit in cable run = 21 V dc minimum
- Unit current draw (I) is the same regardless of the unit’s placement along the cable run for ease of calculation. (~1.1 amperes when unit is producing a 12-watt sine wave output.)

For conditions other than above, the following formula may be helpful in calculating the approximate maximum distance for a single station.

For continuous tone applications with minimum distortion:

$$\frac{V_{\text{FEEDPOINT}} - V_{\text{MINIMUM}}}{(2 \times \text{AWG WIRE RESISTANCE PER FOOT @} \sim 20^{\circ}\text{C}) \times \text{UNIT I [IN AMPS @12W OUT]}} = \text{APPROXIMATE MAXIMUM DISTANCE IN FEET}$$

For speech operation only, multiply the above result by a factor of 2 to a maximum factor of 4.

**Example:** What is the approximate maximum distance for a single dc station if the voltage feed is 27.5 V dc and a 14 AWG wire is used @ 20° C?

Info:

- 14 AWG @ 20° C = ~0.002525 ohms per foot
- Vfeedpoint = 27.5 V dc

Solution:

$$\begin{aligned} & (27.5 \text{ V} - 21 \text{ V}) / ((2 \times 0.002525 \text{ ohm per foot}) \times 1.1 \text{ amp}) \\ & = 6.5 / 0.005555 \\ & = 1170 \text{ feet (for continuous tone signal) or up to } \sim 4680 \text{ feet } (\times 4) \text{ for speech signals} \end{aligned}$$

## Mounting

Refer to Figure 1 for a typical installation of desk-edge or desktop subset stations in the knee-well of the desk. Refer to Figure 2 for a typical installation of flush-mount subset stations. Place the enclosure in a location that provides easy installation and removal of the connectorized subset cabling, the plug-in amplifier, the speaker cabling, and the system cabling.

**NOTE:** The GAI-Tronics subsets designed for use with this enclosure contain 8-foot (244 cm) connectorized cables. This enclosure must be mounted within reach of these cables.

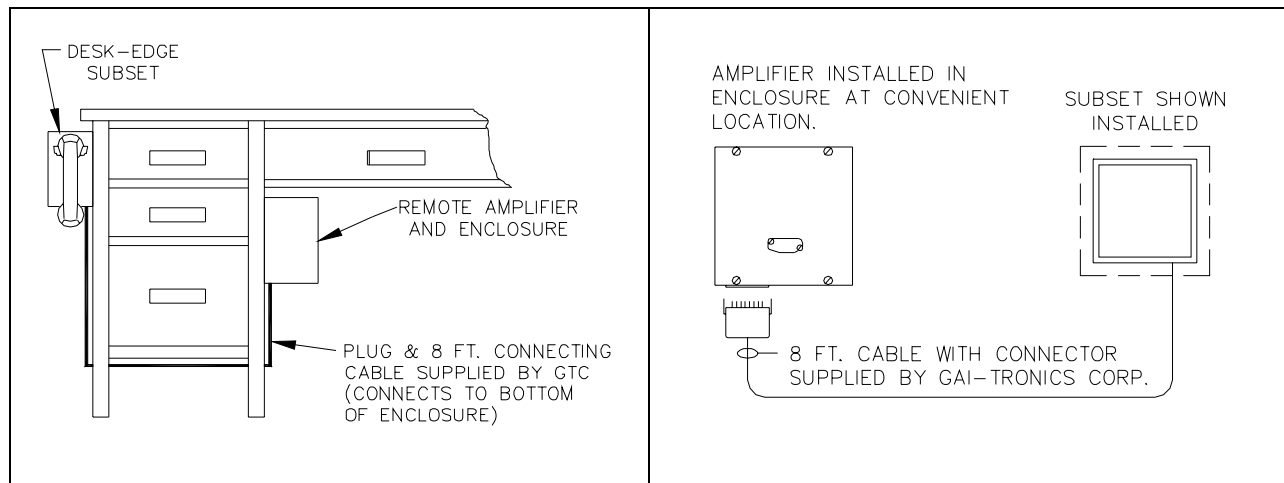


Figure 1. Typical Desk-edge Installation

Figure 2. Typical Flush-mount Installation

The Model 7245-003 Indoor Enclosure is not supplied with openings for conduit or cable. Drill or punch these openings using the supplied template before mounting the enclosure. The best location for the conduit holes is along the top or bottom of the enclosure and near the rear surface. Avoid the top center as it may interfere with the plug-in amplifier receptacle.

In extreme environments, extra precautions should be taken to improve system reliability. Whenever possible, do not install conduit from the top. Side or bottom entry helps to prevent moisture from dripping onto the terminals or printed circuit boards.

There are four 0.312-inch diameter mounting holes in the corners of the amplifier enclosure. See Figure 3 for dimensions. When mounting the enclosure, use caution to avoid damaging the terminal blocks inside. Install the connector guard over the remote cable plug using the screws provided as shown in Figure 3 to comply with NRTL requirements.

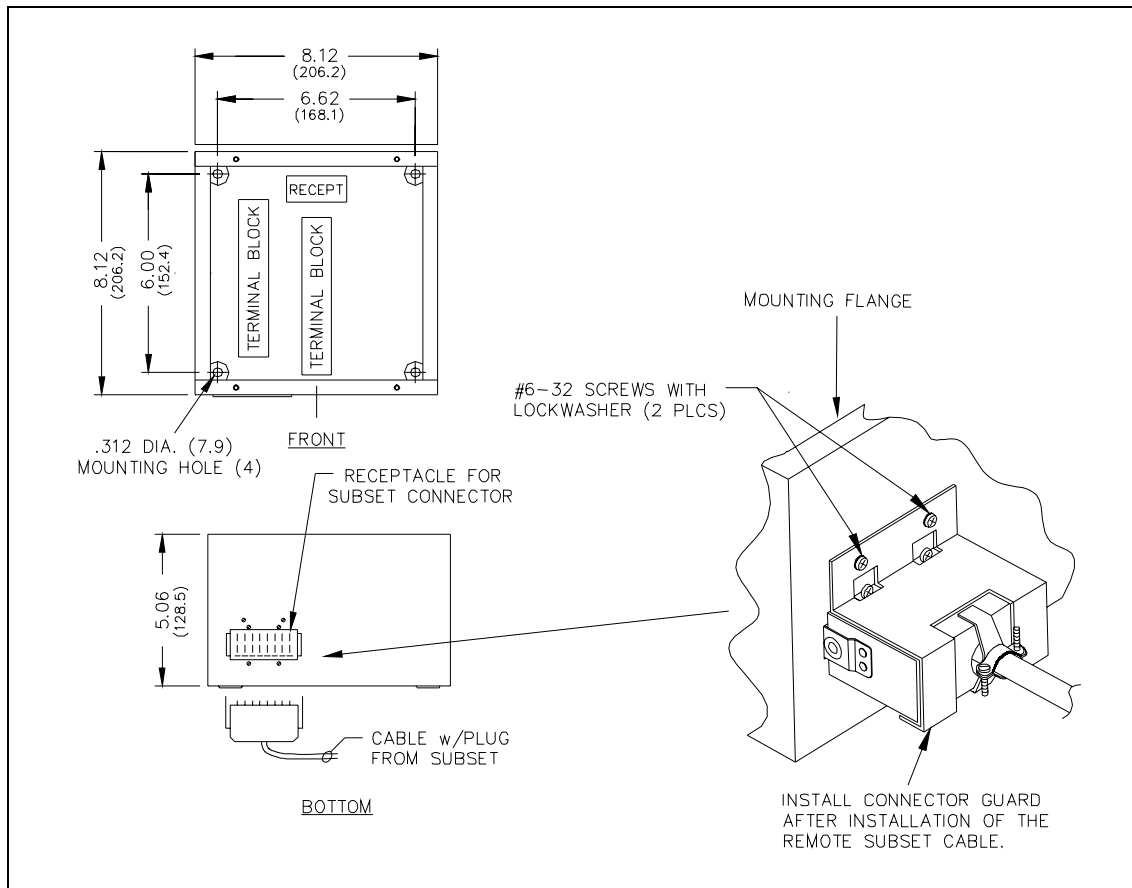


Figure 3. Mounting Details

## Wiring

Attach the conduit to the enclosure. Feed the wiring through the conduit and bring it into the enclosure. See Figure 4. Follow the wire colors carefully because the colors correspond to GAI-Tronics 60029 or 60038 Series multi-party cable. The wires must be spade-lugged and connected carefully and completely to the terminal block. An improper termination may result in diminished station performance.

1. Set the speaker muting control to the desired location. Refer to the Local Muting and Mutual Muting sections for details.
2. Plug the subset connector into the receptacle located at the bottom of the enclosure. Secure the connector with the connector guard and screws provided. See Figure 3.
3. Insert the plug-in amplifier into the enclosure and secure the amplifier with four screws.

### Local Muting

Figure 4 illustrates local speaker muting when stations are completely assembled and paging operation occurs. Normally, when the station button is pressed, the paging speaker connected to that station is silenced (muted) to prevent acoustic feedback to the handset microphone. However, while the handset is in use for party line conversations, the paging speaker is “live” to enable paging calls from other stations.

To disable the mute feature, follow these instructions:

1. Locate the lugged violet wire attached to terminal point 7 (mute) on the terminal block within the enclosure.
2. Transfer the lugged violet wire to terminal point 8 (Page L1).

After any muting changes are made, unpack the station amplifier and install.

### Mutual Muting

In the event that feedback occurs within an area and repositioning of the system speakers does not help, mutual muting may be used to correct this problem.

The following steps mutually mutes adjacent amplifiers/handsets within a zone.

1. Ensure that the purple lugged wire is connected to terminal 7 of TB1.
2. Connect terminal TB1-7 of the handset station to TB1-7 of the station within the zone that is causing feedback. This is done by using the spare system wire (orange conductor) from within the system cable that runs between the stations.

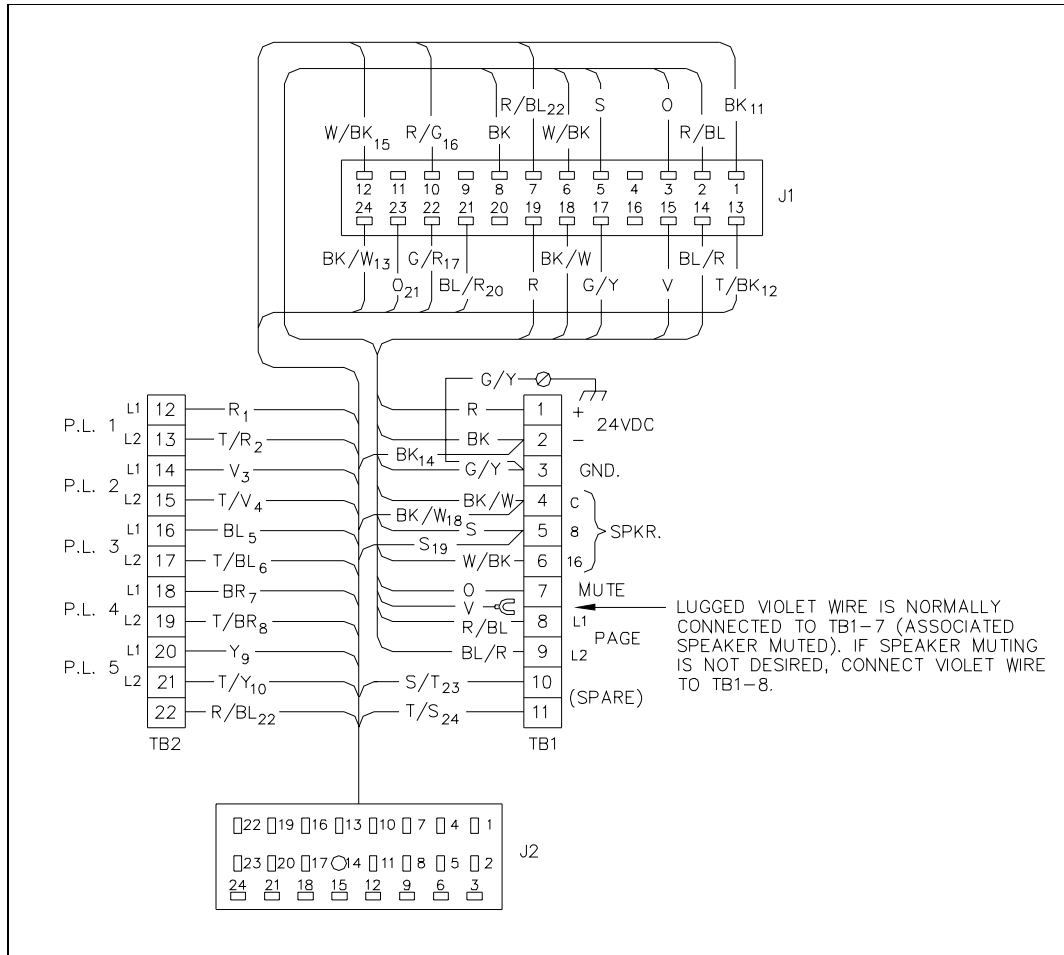




Figure 4. Wiring Details

## Maintenance

Regular inspection and a good preventive maintenance program will increase the reliability of your GAI-Tronics station. The GAI-Tronics Field Service Department can formulate a service contract suited to your facility's specific need for preventive maintenance.

In addition, the following procedure can be used to keep Page/Party<sup>®</sup> systems operating effectively.

 **WARNING**  **Before performing any of the following preventive maintenance steps, remove all power from the station.**

1. Remove the amplifier from the enclosure.
2. Visually check the interior of the enclosure for signs of contamination such as dust, condensation or process liquid.
3. Using the No. 10440-003 Maintenance Cable, plug the amplifier into the connector in the enclosure. Check, and if necessary, adjust the amplifier to maximize performance.
4. Reinstall the amplifier in the enclosure. Ensure that all gaskets and hardware are in place. Failure to install the gaskets, which also act as spacers, can result in damage to the connectors on the amplifiers and inside the enclosures and can cause system faults.

It may become necessary to re-terminate some or all of the enclosures in a system. If so, strip the wires back to clean copper and connect only one wire to each connector to allow for easier future troubleshooting.

## Troubleshooting

The following table lists some hints to aid technicians in troubleshooting.

Problem	Solution
Feedback occurs only during page.	<ol style="list-style-type: none"> <li>1. If a speaker is close to the station, try using the muting feature in the amplifier enclosure at the terminal blocks. Connect the violet wire at TB1-8 to TB1-7. Refer to the wiring diagram.</li> <li>2. Ensure that speakers attached to other stations located nearby are not pointed in your direction. If changing the orientation of the other speakers has no effect, mutual muting may be required. Mutual muting silences all the speakers within proximity to the affected stations during a page from any one of the mutually muted stations. Connect the orange wire (spare) to the TB1-7 of all the stations to be mutually muted. Note: If too many stations are selected, paging coverage can be adversely affected.</li> <li>3. Check line terminations at the line balance assembly. Line balance assembly connections are critical.</li> </ol>
Remote subset is inoperable.	<ul style="list-style-type: none"> <li>• Verify that the connector of the remote subset is securely connected to the subset receptacle of the enclosure.</li> <li>• Remove the amplifier from the enclosure. Re-install the amplifier ensuring the enclosure connector and the amplifier connector are aligned properly.</li> </ul>
Crosstalk occurs.	One or more system cable pairs may be improperly terminated. Visually inspect the system cable connections for accidental crossing of the cable pairs or grounds.

# Specifications

## Mechanical

Construction/finish ..... 16-gauge cold-rolled steel/gray polyurethane  
 Mounting ..... Wall or column, four 0.312-inch (7.92 mm) diameter mounting holes  
 Connections ..... Internal screw-type barrier terminal blocks;  
 24-pin subset connector  
 Dimensions ..... 8.1 H × 8.1 W × 5.1 D inches (206 × 206 × 129 mm)  
 Shipping weight ..... 5.5 lbs. (2.5 kg)

## Environmental

Temperature range..... -22° F to 158° F (-30° C to +70° C)  
 Relative humidity ..... Non-condensing, 85% maximum  
 Indoor environmental rating ..... Meets requirement of IP20

## Approvals

Approval .....NRTL certified for use in US and Canada.....Class I, Div. 2, Groups A, B, C, D,  
 CE mark:..... Complies with Low Voltage Directive 73/23/EEC, and  
 the EMC Directive 89/336/EEC amended by the Directive 93/68/EEC

## Replacement Parts

Part Number	Description
61511-006	Harness Assembly
12535-001	Hardware Kit for Harness Assembly
10440-003	Maintenance Cable



TYPICAL SINGLE-PARTY SYSTEM CONNECTION DIAGRAM

