



GAI-TRONICS® CORPORATION
A HUBBELL COMPANY

SP2 Remote Handset/Speaker Amplifier Station

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Confidentiality Notice

This manual is provided solely as an installation, operation, and maintenance guide, which 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.

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General Information

Product Overview

The GAI-Tronics SP2 station is a modular industrial multicast Voice over Internet Protocol (VoIP) communications system that can include from two to 4096 stations. The standard remote configuration is an indoor handset/speaker amplifier station using ac power with RTU control. They are constructed of cold rolled steel with a gray or safety orange powder coat finish. A number of options are available to add to or modify station capabilities. See Features and Options below for more details.

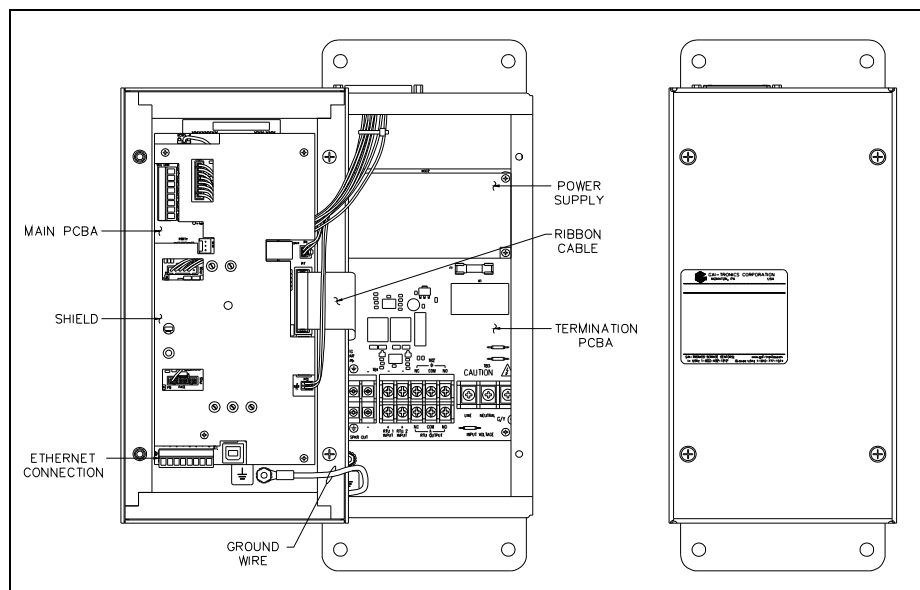


Figure 1. SP2 Remote Station Front Panel

SP2 stations connect to an Ethernet network so the loss of a single station will not adversely affect the system as a whole. The stations require a 100 Mbps link to a network switch using Category 5 or better cable. To ensure the quality of SP2 audio, it is recommended that SP2 network traffic be isolated from other devices and that network switches and routers be properly configured for Internet Group Management Protocol (IGMP) snooping and multicast filtering. Maximum cable runs between SP2 stations and network switches are limited to 100 meters to comply with Ethernet standards.

Features

- Flexible and highly configurable SMART technology featuring Ambient Level Sensing (ALS), real time self-diagnostics of audio path connectivity with health check output via SMTP, and available remote monitoring.
- Real-time operation providing instantaneous page and party line communication without the delays associated with conventional networked communications requiring a SIP server or conference bridge.
- One-way live paging and alarm annunciation over system speakers without the delays associated with record/playback paging systems.
- Distributed amplifier topology so that the loss of a single amplifier shall not adversely affect the system as a whole.
- High efficiency (>80%) Class D paging amplifier provides up to 30 watts of speaker output at 8 ohms.
- Five configurable multicast channels for full-duplex conference communication with party line selector switch.
- Eight configurable multicast channels for receiving page announcements.
- One isolated output for beacon activation.
- Two isolated inputs
- Configurable priority scheme to allow urgent/emergency pages to override less important pages.
- Configuration stored in non-volatile memory eliminating the need to reprogram after power failures.
- Field adjustable volume control for handset earpiece and speaker amplifier.
- Configurable local speaker and nearby speaker mutual muting to prevent acoustic feedback of live pages.
- Off-hook and page switch timeout functionality.
- Configurable virtual zoning ability.
- Mutual provisioning mode allows easy system deployment.
- USB interface for field or bench configuration.
- Universal ac power supply.
- Durable, high visibility safety orange powder coat finish.



Options

- Optional 70/100V constant voltage termination board with 24-watt monitored output.
- Conformal coating for PCBA.
- Configurable pre-announcement tone.



Installation



Important Safety Instructions

- Read, follow, and retain instructions—All safety and operating instructions should be read and followed before operating the unit. Retain instructions for future reference.
- Heed warnings—Adhere to all warnings on the unit and in the operating instructions.
- Attachments—Attachments not recommended by the product manufacturer should not be used, as they may cause hazards.
- Servicing—Do not attempt to service this unit by yourself. Opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

 **ATTENTION**  Install equipment without modification and according to all applicable local, national and international electrical codes. North America - Consult the National Electrical Code (NFPA 70), Canadian Standards Association (CSA 22.1), and local codes for specific requirements regarding your installation. Class 2 circuit wiring must be performed in accordance with NEC 725.55.

This equipment is suitable for use in Class I Division 2 Groups A, B, C and D, Class II Division 2 Groups F and G, Class III, OR non-hazardous locations only. Combinations of equipment in your system are subject to investigation by the local authority having jurisdiction at the time of installation.

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

 **WARNING**  **—EXPLOSION HAZARD—**Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous. Avertissement—Risque d’explosion—avant de déconnecter l’équipement, couper le courant ou s’assurer que l’emplacement est désigné non dangereux.

These enclosures must be installed by trained, qualified and competent personnel. Installation must comply with state and national regulations, as well as safety practices for this type of equipment.

The mounting location must be flat and provide proper clearance, rigidity and strength to support the enclosure and all contained devices.

 **WARNING**  **Do not disconnect equipment while energized.**

Insure proper grounding to protective earthing.

Mounting the Enclosure

Mount the enclosure using the four 0.312-inch (8 mm) diameter holes located on the mounting flanges with ¼-inch (M6) hardware. The SP2 Station is not supplied with conduit or cable openings.

Remove the front panel and drill or punch entry openings in the rear section of the enclosure. The station is suitable for top and/or bottom entry as shown in Figure 2; however, bottom entry is recommended to prevent moisture from dripping onto the termination board. There must be a minimum of ½ inch (13 mm) of material between entry holes.

For specific details including mounting hole dimensions, refer to Figure 2. When mounting the enclosure, use caution to avoid damaging the internal components.

The suggested mounting height for all station enclosures is 48 inches (1219 mm) to the center of the bottom mounting holes of the enclosure.

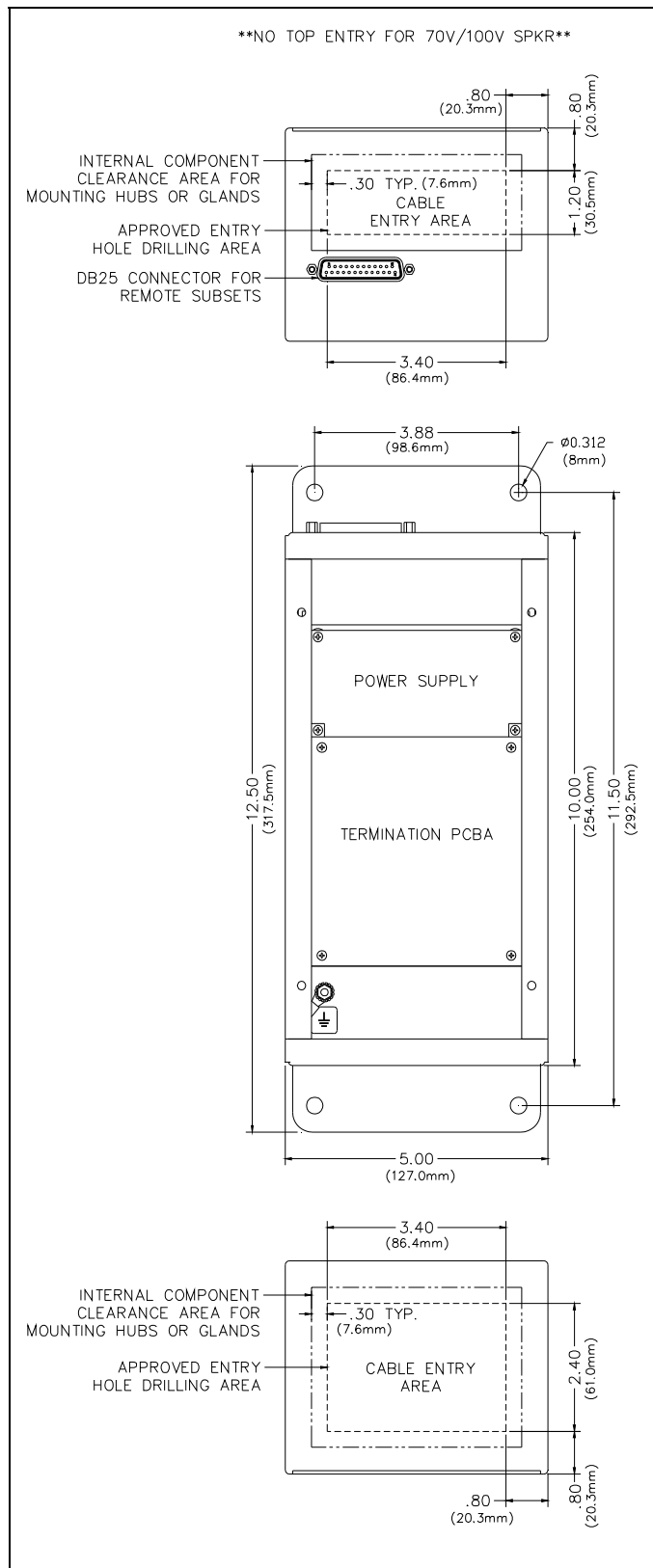


Figure 2. Suggested Wire Entry Locations

Opening the Station

⚠ WARNING ⚠ Before performing any of the following settings and adjustments, remove all power from the station.

⚠ WARNING ⚠ To reduce the risk of hazardous atmospheres, disconnect the equipment from the supply circuit before making any adjustments to the amplifier's handset level.

Remove the four screws from the front panel and turn it to the left so that the interior surface faces you. Allow the wiring and ribbon cables to remain connected. Using two of the screws just removed, mount the front panel to the back box's left-side mounting holes. The front panel interior surface and the back box interior now face you. This configuration presents the easiest access for troubleshooting and setting adjustments.

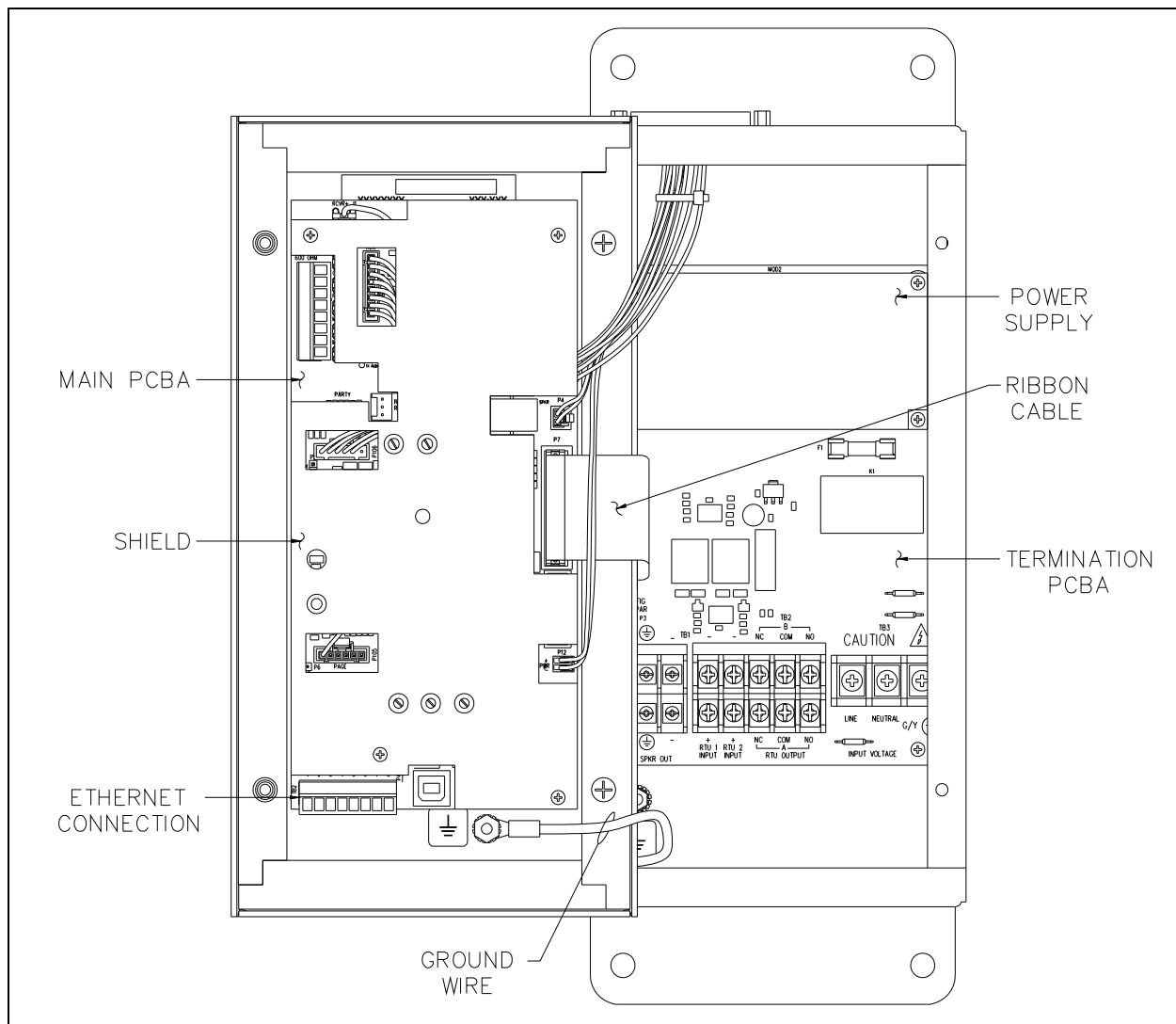


Figure 3. SP2 Remote Station (AC Version Shown)—Interior View

Field Wiring and Configuration

The SP2 Station provides terminal blocks for field wiring on the Termination PCBA located in the rear enclosure, including power, speaker wiring, and RTU connections. The Main PCBA, mounted to the back of the front panel, provides the Ethernet network connection.

For field wiring, connect spade lugs to the wires before securing them to the terminal blocks for the most secure connection. Torque the terminal block screws to 8–10 in-lb (0.90–1.13 Nm) when attaching the spade lugs.

After all the field wires are pulled into the rear enclosure, install all connections as indicated below.

NOTE: Consult the National Electrical Code (NFPA 70), Canadian Standards Association (CSA 22.1), and local codes for the specific requirements regarding your installation. Install all equipment without modification and according to the local and national codes. Class 2 circuit wiring must be performed in accordance with NEC 725.55.

Termination PCBA

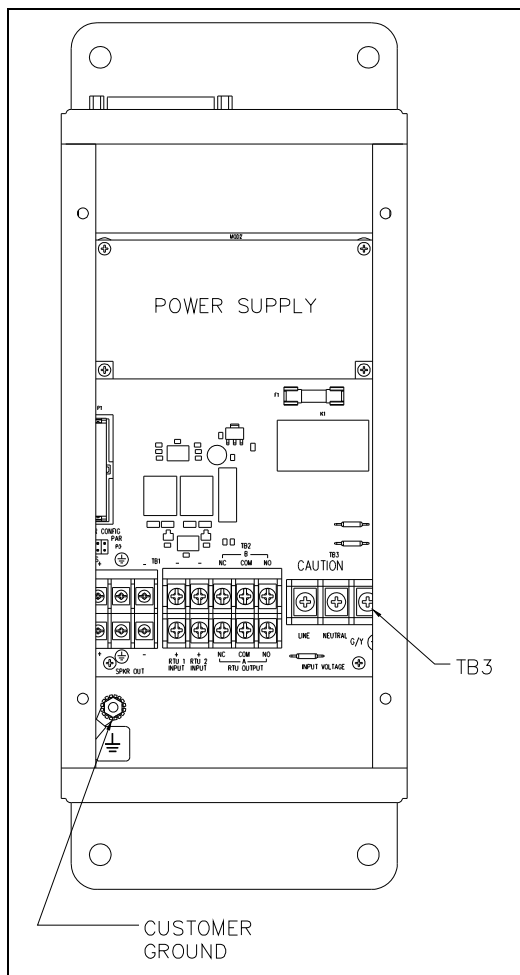


Figure 4. Main Termination PCBA
(Rear Enclosure)

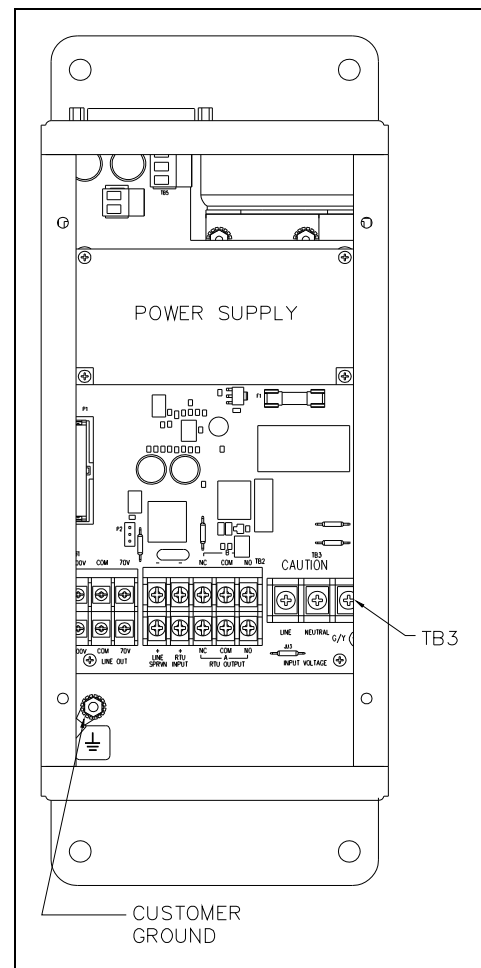


Figure 5. 70 V/100 V Speaker Line Monitor
Termination PCBA
(Rear Enclosure)

Power

The ac power supply is included on the Termination PCBA. The Termination PCBA includes a terminal block, TB3, for connection of local power to the station. Connect the power conductors for the power source in accordance with the table below. Refer to Figure 4 and Figure 5 for the location of TB3.

Table 1. AC Power—TB3

Pin	Label	Description
TB3-1	LINE	Positive
TB3-2	NEUTRAL	Negative
TB3-3	⊥	Earth ground

Direct Speaker Connection and Jumper Settings

Terminal block TB1 provides connection termination for the station speaker output to the remote speaker(s). There is a redundant set of terminals for a second speaker branch to be connected in series or parallel with the primary speaker. Configure the speaker jumpers P2 and P3 for the appropriate impedance for use with 8-ohm or 16-ohm speakers as shown in Figure 6. The following table provides the proper terminations for the external speaker(s).

Table 2. Speaker Connections—TB1

Pin	Label	Description
TB1-1	+	Primary Parallel/Speaker A Series—Output
TB1-2	⊥	Earth Reference
TB1-3	–	Primary Parallel/Speaker A Series—Output
TB1-4	+	Secondary Parallel/Speaker B Series—Output
TB1-5	⊥	Earth Reference
TB1-6	–	Secondary Parallel/Speaker B Series—Output

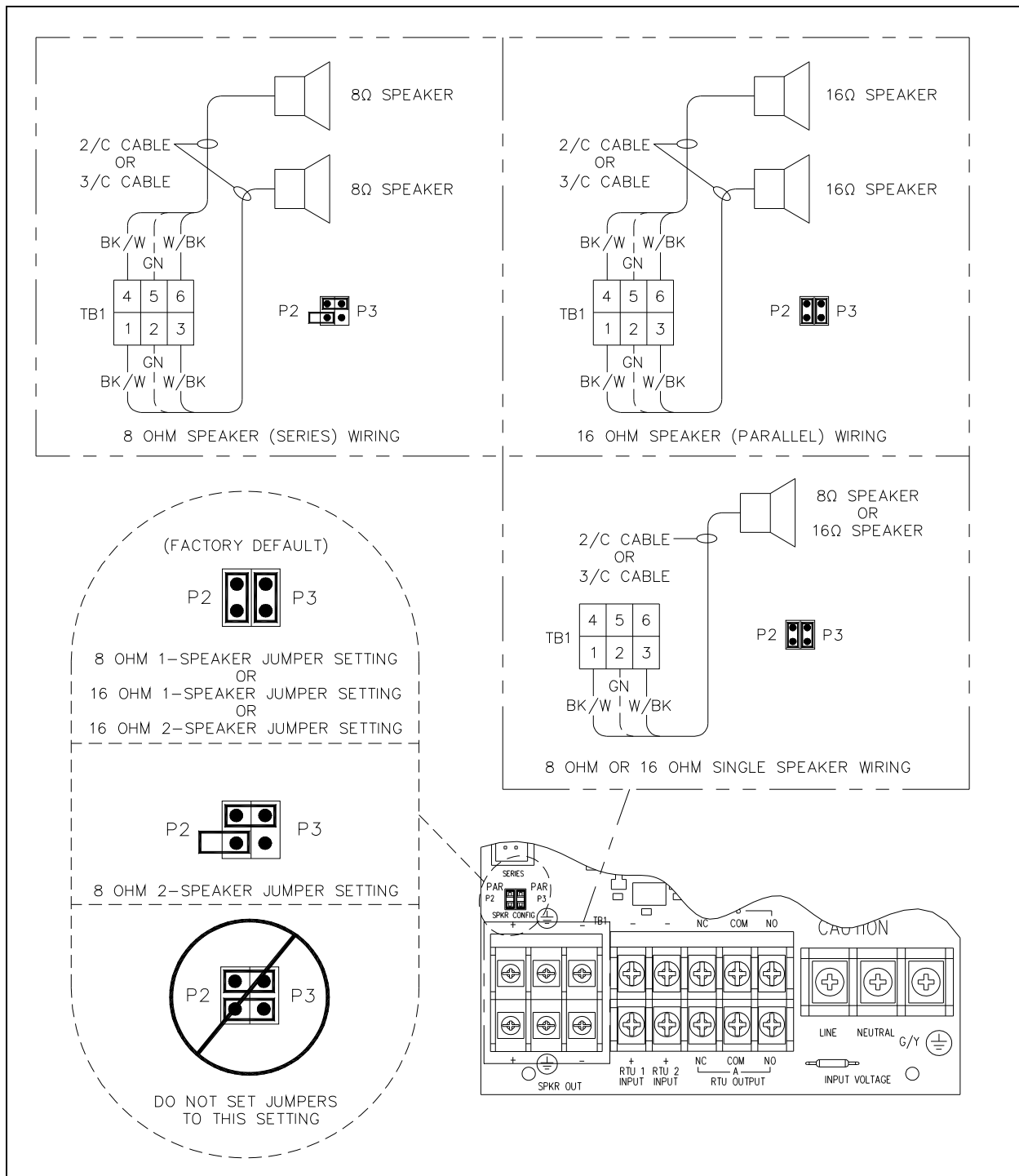


Figure 6. Speaker Jumper Impedance Configuration Options for 8-ohm and 16-ohm Speakers

RTU Input

Two auxiliary inputs have been provided for customer use. Terminations for these inputs are provided on TB2 of the Termination PCBA. For detailed RTU field wiring configurations, see Figure 7.

NOTE: SP2 stations equipped with the optional 70 V / 100 V termination board dedicate an RTU input for speaker cable supervision, leaving one customer configurable RTU input.

Table 3. Auxiliary Inputs—TB2

Pin	Label	Function
TB2-1	+ RTU 1 INPUT	RTU Input 1 +
TB2-2	-	RTU Input 1 -
TB2-3	+ RTU 2 INPUT	RTU Input 2 +
TB2-4	-	RTU Input 2 -

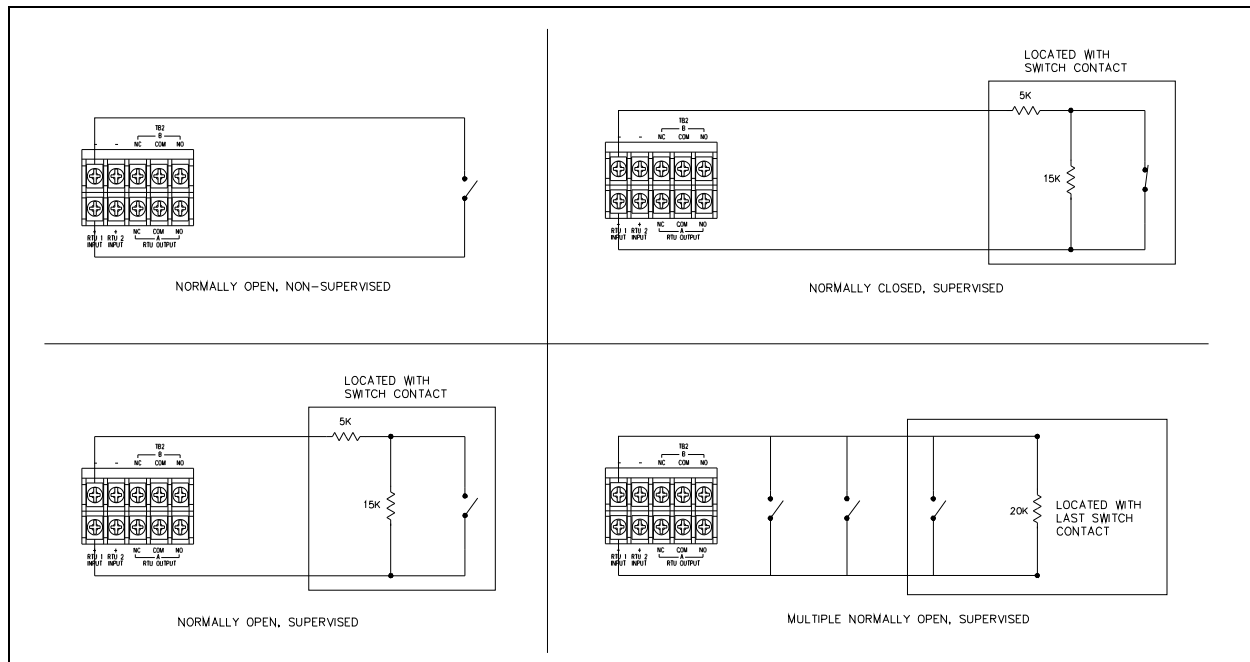


Figure 7. RTU Input Wiring Configurations

RTU Output

Two Form “C” outputs are provided to power a beacon as shown in Figure 8. These outputs can be reconfigured for customer use by removing jumpers JU1 and JU2. Terminations for these outputs are provided on TB2 of the Termination PCBA.

Table 4. Output Contacts—TB2

Pin	Label	Description
TB2-5	NC A	Normally Closed Output A
TB2-6	NC B	Normally Closed Output B
TB2-7	COM A	Common Output A
TB2-8	COM B	Common Output B
TB2-9	NO A	Normally Open Output A
TB210	NO B	Normally Open Output B

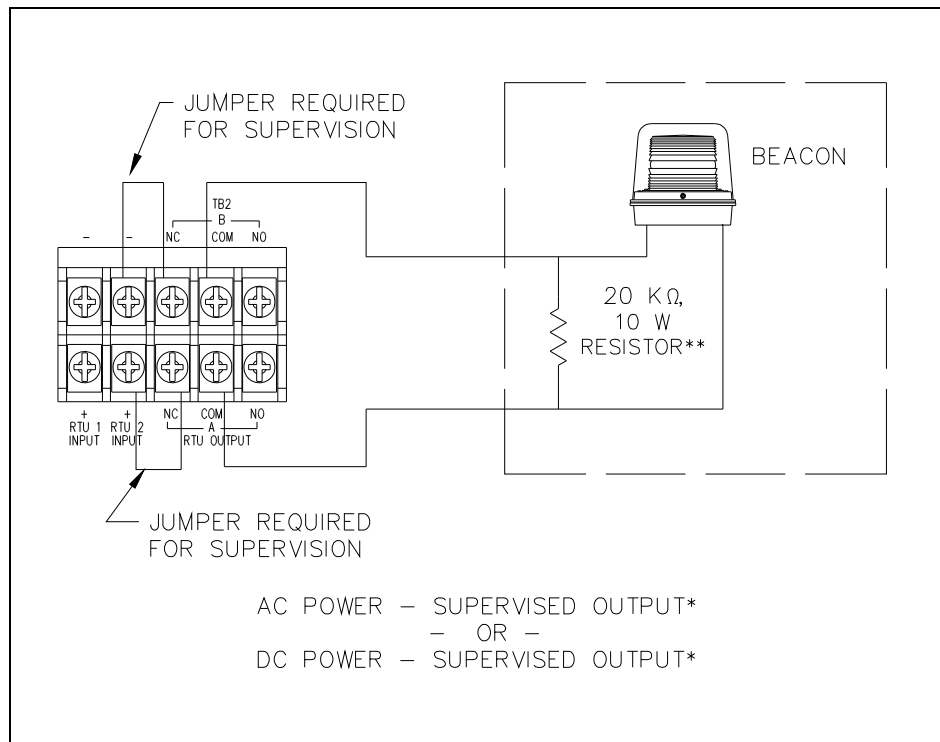


Figure 8. Supervised Output Wiring

***NOTE 1:** Input 2 is used to monitor the beacon wiring and is not available for other functions.

****NOTE 2:** Attention: 20-kilohm, 10-watt supervision resistor is required

Main PCBA

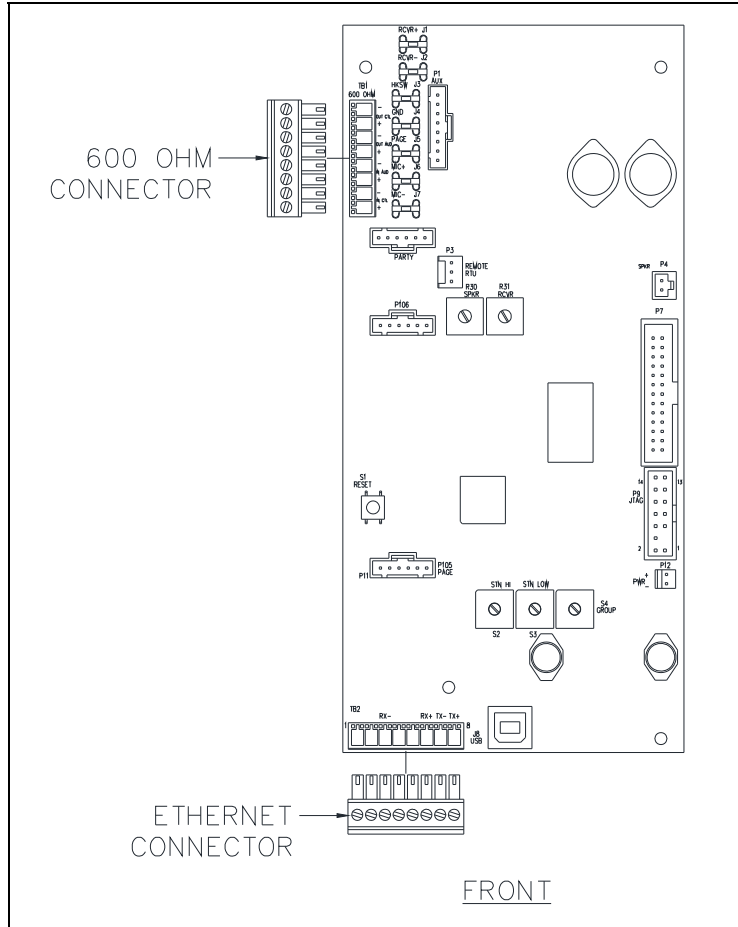


Figure 9. SP2 Main PCBA Connectors

Ethernet Connection

Connect a dedicated Category-5 or better cable to the 8-position pluggable terminal block as shown in Table 5 to the Main PCBA on the rear of the front panel. See Figure 9.

Table 5. Ethernet Connection—TB2

Pin	Label	Description
TB2-1		Unused
TB2-2		Unused
TB2-3	Rx-	Receive -
TB2-4		Unused
TB2-5		Unused
TB2-6	Rx+	Receive +
TB2-7	Tx-	Transmit -
TB2-8	Tx+	Transmit +

Settings and Adjustments

Opening the Station

⚠ WARNING ⚠ Before performing any of the following settings and adjustments, remove all power from the station.

⚠ WARNING ⚠ To reduce the risk of hazardous atmospheres, disconnect the equipment from the supply circuit before making any adjustments to the amplifier's handset level.

Remove the four screws from the front panel and turn it to the left so that the interior surface faces you. Allow the wiring and ribbon cables to remain connected. Using two of the screws just removed, mount the front panel to the back box's left-side mounting holes. The front panel interior surface and the back box interior now face you. This configuration presents the easiest access for troubleshooting and setting adjustments.

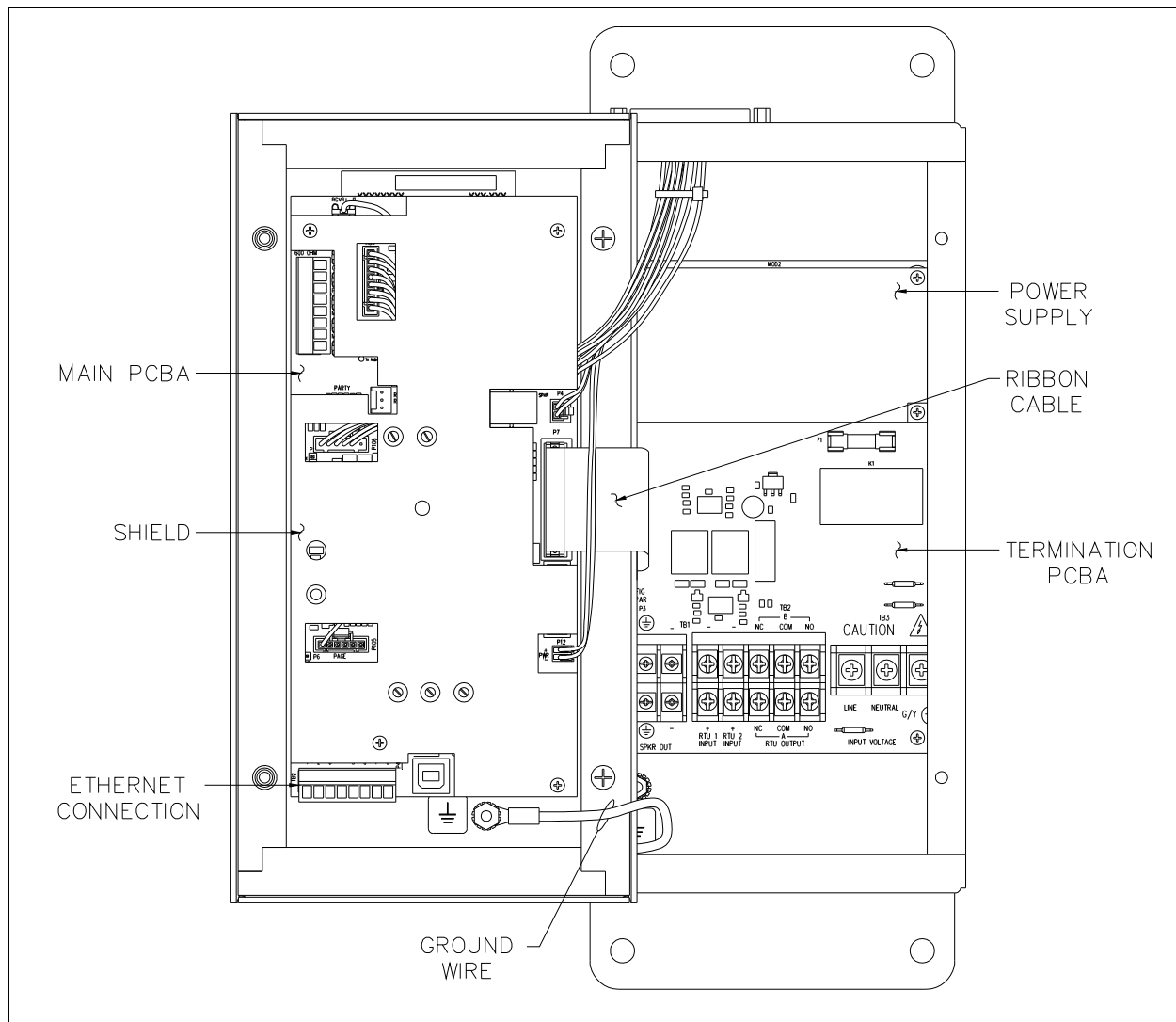


Figure 10. SP2 Station Interior View and Maintenance Configuration

Main PCBA Configuration

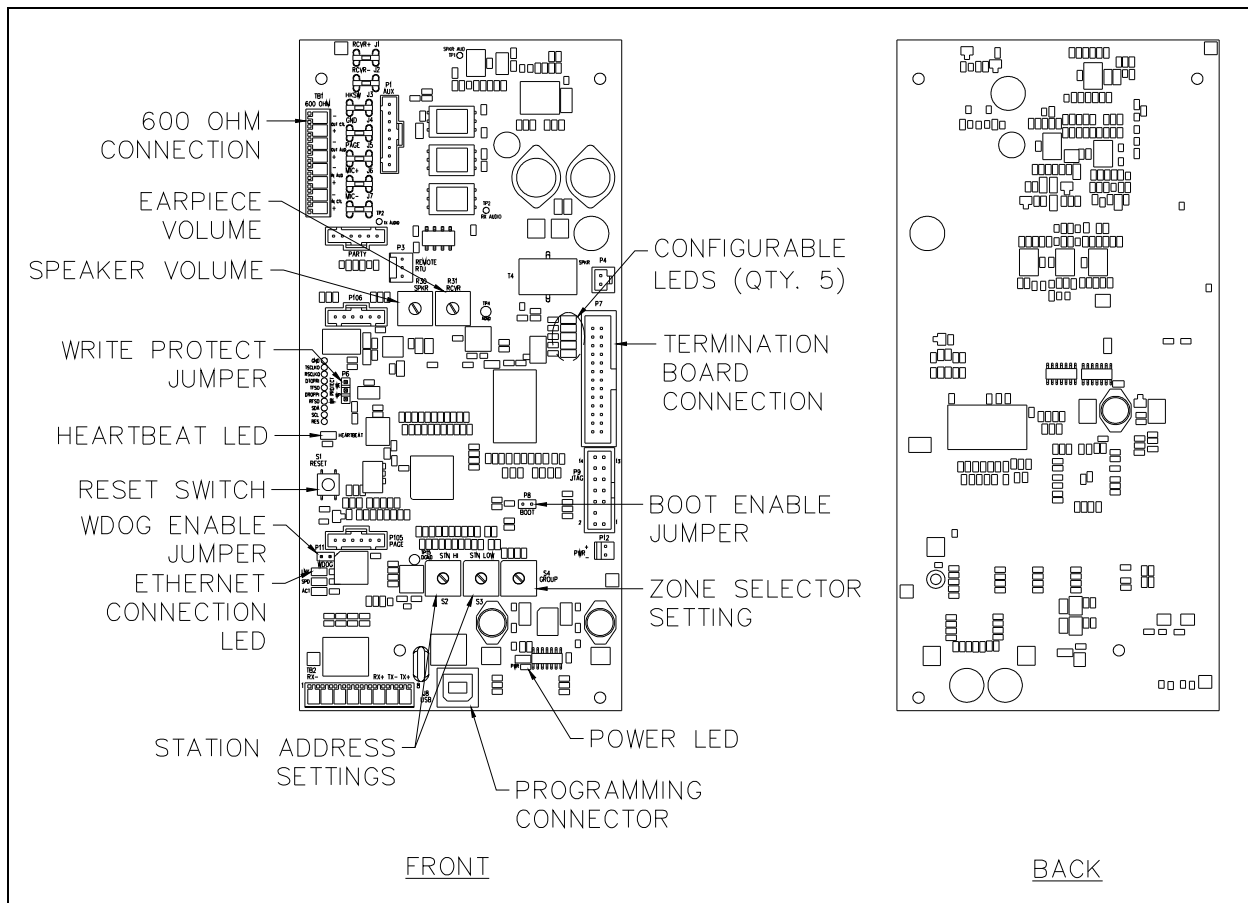


Figure 11. Main PCBA (Front and Rear Views)

Write Protect (EEPROM) Jumper

NOTE: This jumper should not be changed in the field.

WDOG Enable (Watchdog) Jumper

Watchdog jumper, P11, enables a watchdog feature for software purposes and should not be adjusted in the field. The default setting is installed.

Boot Enable Jumper



Jumper P8–BOOT, is required for development purposes and should not be adjusted in the field. The default setting for this jumper is open.

Reset Switch

Reset switch, S1, allows for rebooting the station to its initial state. All of the latest configuration settings remain programmed. Refer to Figure 11 for the location of this switch.

Speaker Volume

The speaker volume potentiometer, R36, adjusts the signal level to the speaker from the page line. The default setting is 4 watts from an 8-ohm speaker and 2 watts from a 16-ohm speaker.

 **WARNING**  Maximum output power may exceed rated speaker wattage resulting in speaker damage.

This setting can also be configured via USB or Ethernet connection using the command line interface.

Receiver Volume

Receiver volume potentiometer, R37, adjusts the audio signal level supplied to the handset earpiece. To adjust the volume, remove the handset from the cradle, turn the RCVR potentiometer R37 fully counter clockwise then adjust the potentiometer while listening in the earpiece for the appropriate test tone level required.

This setting can also be configured via USB or Ethernet connection using the command line interface.

Main PCBA Indicators

Power LED

The Power LED located on the Main PCBA illuminates when power is applied to the station indicating the main board power supply is operational. Refer to Figure 11 on Page 13 for the location of the power LED.

Heartbeat LED

The Heartbeat LED located on the Main PCBA will flash once communication over the LAN is established to indicate the microprocessor is operational. Refer to Figure 11 on Page 13 for the location of this LED.

Ethernet Connection LEDs

Three Ethernet connection LEDs are located on the main PCBA; link (LNK), link speed (SPD), and activity (ACT). The LNK LED is blue, the SPD LED is green, and the ACT LED is yellow. The LNK and SPD LEDs must be off to indicate that a 100 Mbs Ethernet link is active. The activity LED; ACT, will blink yellow to indicate Ethernet data activity. Refer to Figure 11 on Page 13 for the location of these LEDs.

Five Generic LEDs

Five LEDs are located on the Main PCBA and are configured through firmware. Refer to Figure 11 on Page 13 for location of these LEDs. Additional information for configuring these LED indicators is provided in the SP2 software configuration manual. Please see the reference section for a listing of applicable publications.

Attaching the Front Cover

After all adjustments have been completed, place the front cover on the rear enclosure, being careful not to pinch any cables. Secure the front cover using the four screws and washers provided. Torque the screws to 10–12 in·lb (1.13–1.36 Nm).

Programming

SP2 stations are factory configured to provide basic Page/Party[®] functions upon power-up. For custom configurations and larger system designs the stations may need to be reconfigured. Refer to Publication 42004-784A for detailed configuration instructions for setting SP2 configuration parameters. A list of reference documents is located in the reference section of this document.

Operation

Page and Party Line Operation with Standard Handset

Complete the following steps to make a page announcement from the subset connected to the remote SP2 station:

1. Lift the handset from the cradle.
2. Rotate the ALT PAGE selector switch (if available) to the desired multicast channel, or press the ALL CALL button (if available) to select the desired optional destination for the page announcement.
3. If party line conversation is desired, rotate the selector switch to an unoccupied party line.
4. Press and hold the PUSH TO PAGE button (not necessary when using the optional ALL CALL button).
5. After the short “wait” tone is heard (if configured), speak directly into the microphone to broadcast your page announcement.
6. Release the PUSH TO PAGE or handset pressbar and wait for a response on the party line (if requested).

The paged individual(s) respond by picking up a station handset and turning the selector switch to the requested party line. Party line communication is not broadcast over the system speakers. Other individual(s) can also pick up a handset and join the conversation at any time. Always return the handset to the cradle following a page or a party line conversation.

NOTE: The SP2 Station incorporates a noise-canceling microphone to reduce transmitted ambient noise. This requires the user to place the microphone as close as possible to their mouth.

Options

All SP2 Station options are factory installed.

70 V and 100 V Speaker Connections and Monitoring

The 70V/100V Speaker Line Monitor assembly provides the ability to connect several 70-volt or 100-volt speakers to a single SP2 Station. Speakers are wired in parallel to the station. The speaker line can be monitored by looping it back to the SP2 Station. Refer to Figure 12.

For 100 V speakers, connect the wires to the plug for TB1—100V and COM.
For 70 V speakers, connect the wires to the plug for TB1—70V and COM.

Connect the return wires to TB2—Line Supervision + and -.

NOTE: SP2 stations equipped with the optional 70 V / 100 V termination board dedicate an RTU input for speaker cable supervision, leaving one customer configurable RTU input.

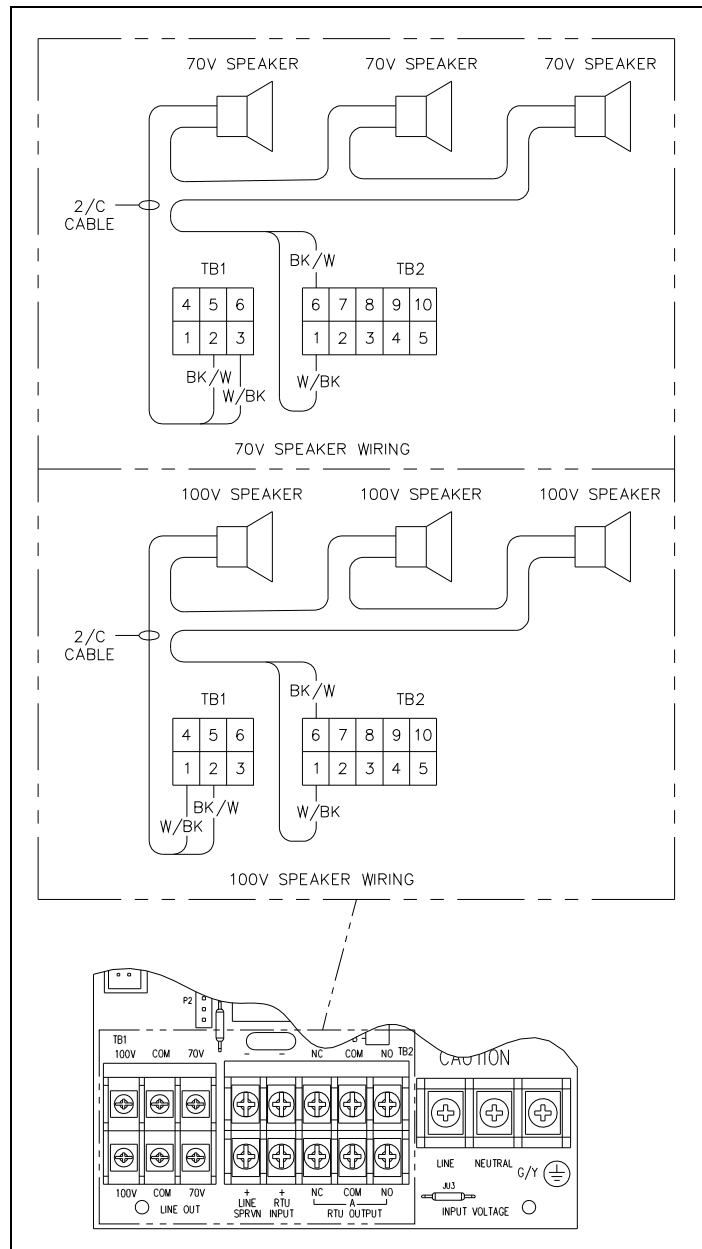


Figure 12. 70 V and 100 V Wiring

Troubleshooting

The following table is provided to aid qualified service personnel in troubleshooting problems with the SP2 Station.

Table 6. Troubleshooting

Problem	Solution
Station not functional	<ul style="list-style-type: none"> • Check for proper wiring and cable terminations. • Verify incoming ac power supply voltage at TB3 on the Termination PCBA. • Verify that the power LED on the main PCBA is illuminated. • Verify that that heartbeat LED is blinking once per second for normal operation.
Network communication not functional	<ul style="list-style-type: none"> • Verify LNK LED on main PCBA is off. • Verify SPD LED on main PCBA is off • Verify IP connection settings using telnet. • Ping station IP address from an admin PC. • Verify network switch settings for Internet Group Management Protocol (IGMP) snooping and multicast filtering.
Handset receiver audio is too high/low.	<ul style="list-style-type: none"> • Refer to “Receiver Volume” on Page 14. • Check the potentiometer settings at R37 • Check handset connections from the DB25 connector wiring. • Check proper cable terminations between Termination and Main PCBAs. • Check operation of hookswitch at the subset. • Replace handset.
Speaker volume is too high/low.	<ul style="list-style-type: none"> • Refer to “Speaker Volume” on Page 13 • Check the pot settings at R36 • Ensure that jumpers P2 and P3 are in the correct position on the termination board for the speaker configuration. See Figure 6. • Ensure the speaker wiring configuration is correct on TB1. • Replace the speaker or driver.
RTU output is not functional.	<ul style="list-style-type: none"> • For supervised output, ensure no monitored output faults exist. • Check fuse F1 on the termination PCBA. • Check the operation of connected device.
RTU input does not function.	<ul style="list-style-type: none"> • For supervised input, ensure no monitored input faults exist. • Check RTU terminal connections on TB2. Refer to the “RTU Input” section and Figure 7. • Check operation of connected device.

Specifications

Power Requirements

AC Input

AC Power Supply

Input voltage 120/230 V ac (nominal), 50/60 Hz

Power factor @ nominal 120 V ac 0.5

Current/Power requirements (+/-10%)

Power Consumed (8-ohm load)	120 V AC	230 V AC
Idle	80 mA/6.6 VA	50 mA/12 VA
4-watt output (default setting)	150 mA/18 VA	110 mA/25 VA
30-watt output	550 mA/65 VA	350 mA/80 VA
Maximum Current Consumption (8-ohm load)	108 V AC	253 V AC
30-watt output	600 mA/65 VA	370 mA/77 VA

Handset Amplifier

Frequency response..... 250–3,000 Hz, +0/–3 dB ref. to 1 kHz

Distortion <1.5% THD @ 1 kHz (below compression level)

Receiver level..... 200 mV_{RMS}, nominal
Adjustable 150–400 mV_{RMS}

Speaker Amplifier

Maximum output:

8-ohm speaker* 30 W into 8-Ω load with –6 dBFS data signal
Adjustable to 30 W; default: 4 W @ 8 Ω

16-ohm speaker 15 W into 16-Ω load with –6 dBFS data signal
Adjustable to 15 W; default: 2 W @ 16 Ω

Frequency response..... 250–6,500 Hz, +0/–3 dB ref. to 1 kHz

Distortion <1% THD @ 1 kHz to 24 W
<3% THD @ 1 kHz to 30 W

*See Figure 13 on Page 20.

Enclosure Specifications

Construction/finish..... 16-gauge cold-rolled steel; safety orange powder coat
Mounting..... Wall or column, four 0.31-inch (7.8 mm) mounting holes
Termination connections..... Screw-type barrier terminal blocks for power, speaker, and RTU
Phoenix connector pluggable terminals for 600- Ω and Ethernet

Dimensions

Enclosure 10.00 H \times 5.00 W \times 4.00 D in (254.0 \times 127.0 \times 101.6 mm)

Overall 12.50 H \times 5.25 W \times 7.34 D in (317.5 \times 133.4 \times 188.4 mm)

Net weight..... Standard amplifier: 6.0 lb
70V/100V amplifier: 7.0 lb

Shipping weight Standard amplifier: 7.0 lb
70V/100V amplifier: 8.0 lb

Ethernet Specifications

Cable Category 5 or better

Speed..... 100 Mbps

RTU Specifications

Output Control

Maximum load current..... 8 A OUTPUT 1A (unfused)
1.6 A OUTPUT 1B (fused)

Maximum in-rush current 15 A

Maximum voltage 250 V ac

Input Control

Switch type..... Normally open (N.O.) or normally closed (N.C.) dry contacts

End-of-line termination..... 20 k Ω , or 15 k Ω + 5.1 k Ω

Cable resistance 100 Ω maximum loop resistance

Contact closure resistance 1 k Ω maximum

Open fault detection..... >65 k Ω

Short fault detection..... <200 Ω

70V/100V Speaker Output Option Specifications

Maximum output..... 24 W

Nominal output voltage..... 70.7 V or 100 V

Environmental

Temperature range (operation and storage) -22 $^{\circ}$ F to 158 $^{\circ}$ F (-30 $^{\circ}$ C to 70 $^{\circ}$ C)

Humidity 95% non-condensing

Approvals

NRTL certified for use in US and Canada..... UL/CSA 60950

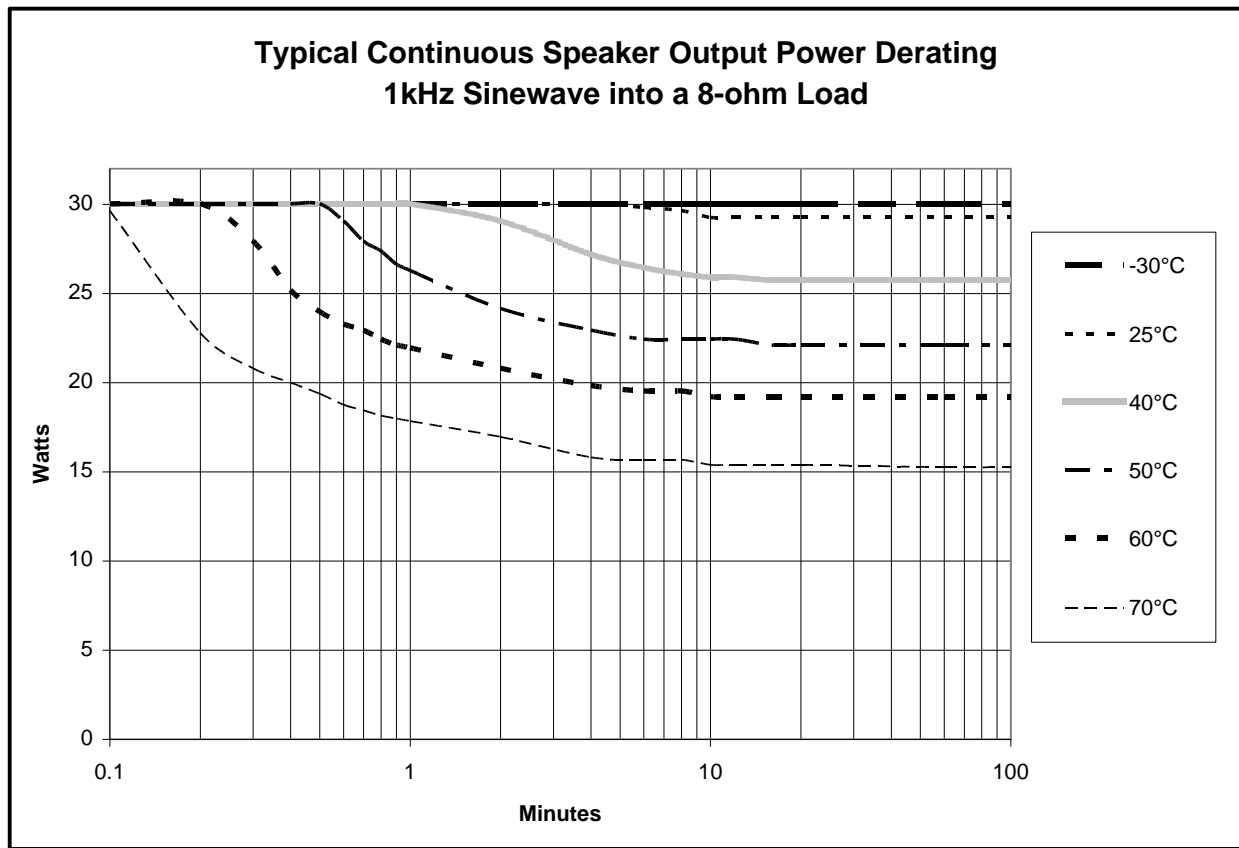


Figure 13. Typical Continuous Speaker Output Power Derating 1 kHz Sine Wave into an 8-ohm Load

Service and Spare Parts

If the equipment requires service or spare parts, contact your Regional Service Center for assistance. If service is required, a return authorization number (RA#) will be issued. 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 GAI-Tronics' warranty policy. 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 with identifying the Regional Service Center closest to you.

Reference

Referenced documents are located on the GAI-Tronics website at the following URL: <https://www.gai-tronics.com/docs/default.htm>.

SP2 Handset/Speaker Amplifier Station Configuration Guide 42004-784

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.

Services. 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.

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

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.