

Introduction

This publication describes the installation procedure for the following:

- 4100-1210 Analog Audio Controller Board
- 4100-1211 Digital Audio Controller Board (Order for Field Replacement only)
- 4100-1311 Digital Audio Controller Board (Constant Supervision)

These products are compatible with 4100U and 4100ES Fire Alarm Control Panels (FACP).

IMPORTANT: Verify FACP System Programmer, Executive, and Slave Software compatibility when installing, or replacing system components. Refer to the Technical Support Information and Downloads website for compatibility information.

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Cautions, Warnings, and Regulatory Information

Cautions and Warnings



READ AND SAVE THESE INSTRUCTIONS- Follow the instructions in this installation manual. These instructions must be followed to avoid damage to this product and associated equipment. Product operation and reliability depend upon proper installation.



DO NOT INSTALL ANY SIMPLEX® PRODUCT THAT APPEARS DAMAGED- Upon unpacking your Simplex product, inspect the contents of the carton for shipping damage. If damage is apparent, immediately file a claim with the carrier and notify an authorized Simplex product supplier.



ELECTRICAL HAZARD - Disconnect electrical field power when making any internal adjustments or repairs. All repairs should be performed by a representative or authorized agent of your local Simplex product supplier.



EYE SAFETY HAZARD - Under certain fiber optic application conditions, the optical output of this device may exceed eye safety limits. Do not use magnification (such as a microscope or other focusing equipment) when viewing the output of this device.

STATIC HAZARD - Static electricity can damage components. Handle as follows:

- Ground yourself before opening or installing components.
- Prior to installation, keep components wrapped in anti-static material at all times.

FCC RULES AND REGULATIONS – PART 15 - This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

SYSTEM REACCEPTANCE TEST AFTER SOFTWARE CHANGES - To ensure proper system operation, this product must be tested in accordance with NFPA 72® after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring.

All components, circuits, system operations, or software functions, known to be affected by a change, must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

NFPA 72® is a registered trademark of the National Fire Protection Association.

Introduction to the Audio Controllers

Overview

The 4100-1210 Analog Audio Controller, 4100-1211 Digital Audio Controller, 4100-1311 Digital Audio Controller, and their respective option cards make up the audio controller subsystem of the Fire Alarm System. The controller is the head end of the audio system, and is seen by the system CPU as a single slave: only the audio card is visible, while any option cards appear logically as memory-mapped locations on the audio controller.

The main function of the audio controller card is to control system audio inputs and to recreate stored audio messages for distribution throughout the system. Analog audio inputs to the system include local and remote microphones and fire fighter phone option cards, and can be expanded through the use of the 4100-1240 Audio Input Option Card. Pre-recorded messages are stored on the audio controller's FLASH memory and can be expanded through the use of the 4100-1241/1242 Message Expansion Card.

While both the analog and digital versions of the controller have the capability to recreate stored digital audio messages, the cards differ in their method of distributing audio throughout the system.

- The 4100-1210 Analog Audio Controller uses analog risers for system distribution and allows 2 channels on 2-wire pairs of digital message reproduction.
- The 4100-1211 or -1311 Digital Audio Controller uses an RS-485-based digital communication means for system distribution. There are up to 8 channels on a single-wire pair of digital message reproduction on this card.

Note: The 4100-1311 DAC is fully backward compatible with previous digital audio systems as long as you set Supervision Jumper P8 to Position 1-2 to silence supervision and have installed 4100U Master Firmware Revision 11.08 or later.

Additional audio controller functionality includes supervision of its inputs and distribution channels (risers), and communication with the system CPU.

Option cards are compatible with either type of Audio Controller Card, as are message files and download software.

LED Functions

For Digital Audio Controller LED functions, refer to Table 1 below.

Reference	Name	Description
LED1 (Applies to both Analog & Digital Controllers)	COMM_LOSS	<ul style="list-style-type: none"> • When ON steadily, indicates the audio controller is not communicating with the master, or is missing its slave exec code. • When OFF, indicates that the controller is communicating with the master. • When FLASHING, indicates the audio controller is downloading data from the message download port.
LED2 (4100-1311 Only) (Applies to Digital Controllers Only)	SECONDARY ENABLE	<ul style="list-style-type: none"> • When ON, indicates the DAR is in degraded mode (Class A is enabled). • When OFF, indicates the DAR is not in degraded mode (Class A is disabled).
*LED3 (4100-1311 Only) (Applies to Digital Controllers Only)	DAR SOURCE	<ul style="list-style-type: none"> • When ON, indicates that the DAR riser's source is the DAR that's coming from the PDI. • When OFF, indicates the DAR riser's source is this audio card's DAR.
*LED4 (4100-1311 Only) (Applies to Digital Controllers Only)	PDI DIRECTION	<ul style="list-style-type: none"> • When ON, indicates that this card is receiving the DAR from the PDI. • When OFF, indicates that this card is driving its DAR onto the PDI.

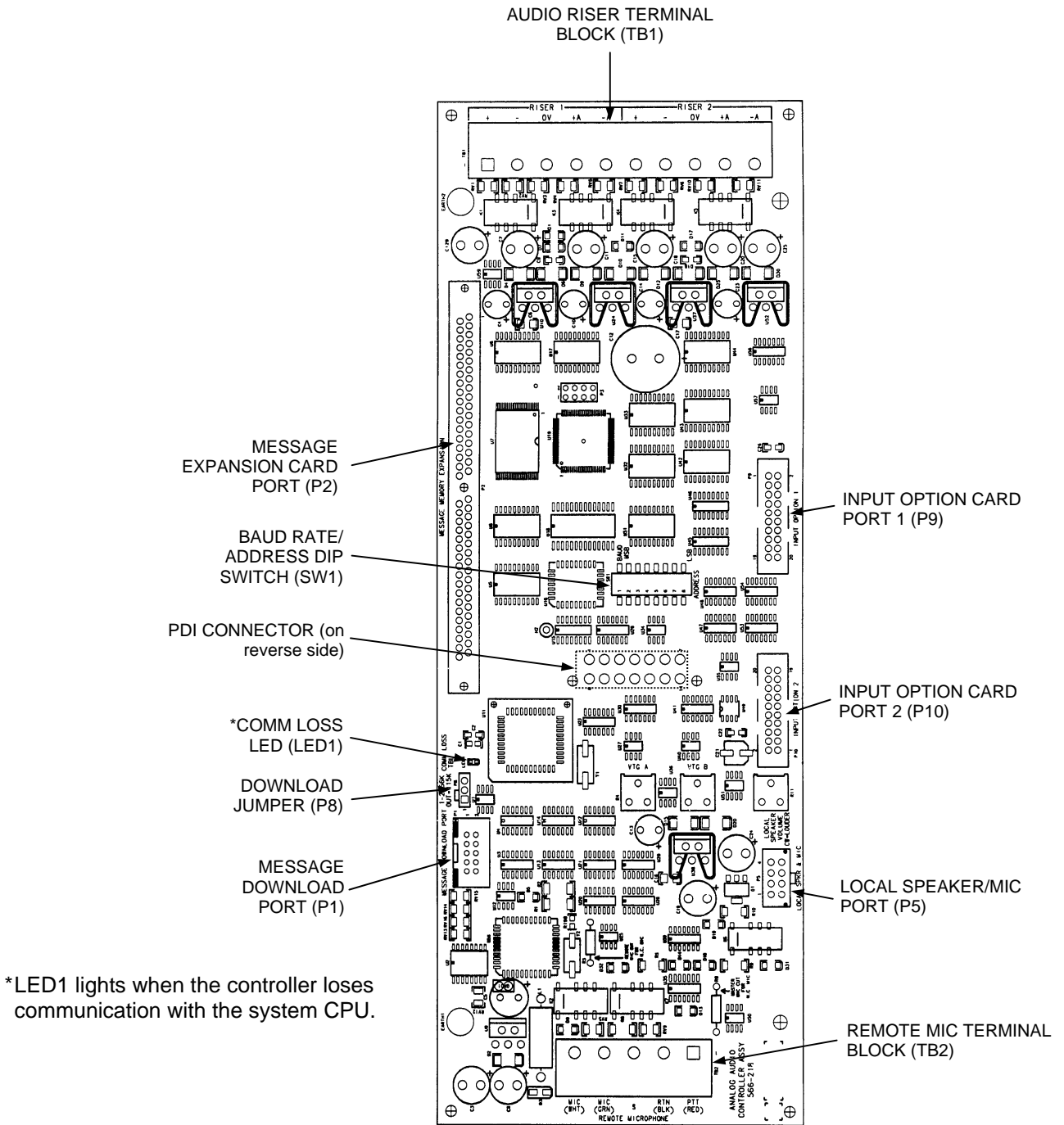
*When the 4100-1311 Digital Audio Controller replaces the 4100-1211 Digital Audio Controller, LEDs 3 & 4 on the 4100-1311 should always be OFF. In most situations, LEDs 3 & 4 should both be ON or OFF at the same time; only in rare circumstances would these LEDs be in different states (such as when they are user-defined in custom control equations).

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Introduction to the Audio Controllers, *Continued*

Analog Controller Illustration

Figure 1 depicts the analog audio controller.



* LED1 lights when the controller loses communication with the system CPU.

Figure 1. The 4100-1210 Analog Audio Controller

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Introduction to the Audio Controllers, *Continued*

Digital Controller Illustration

Figure 2 depicts the digital audio controller.

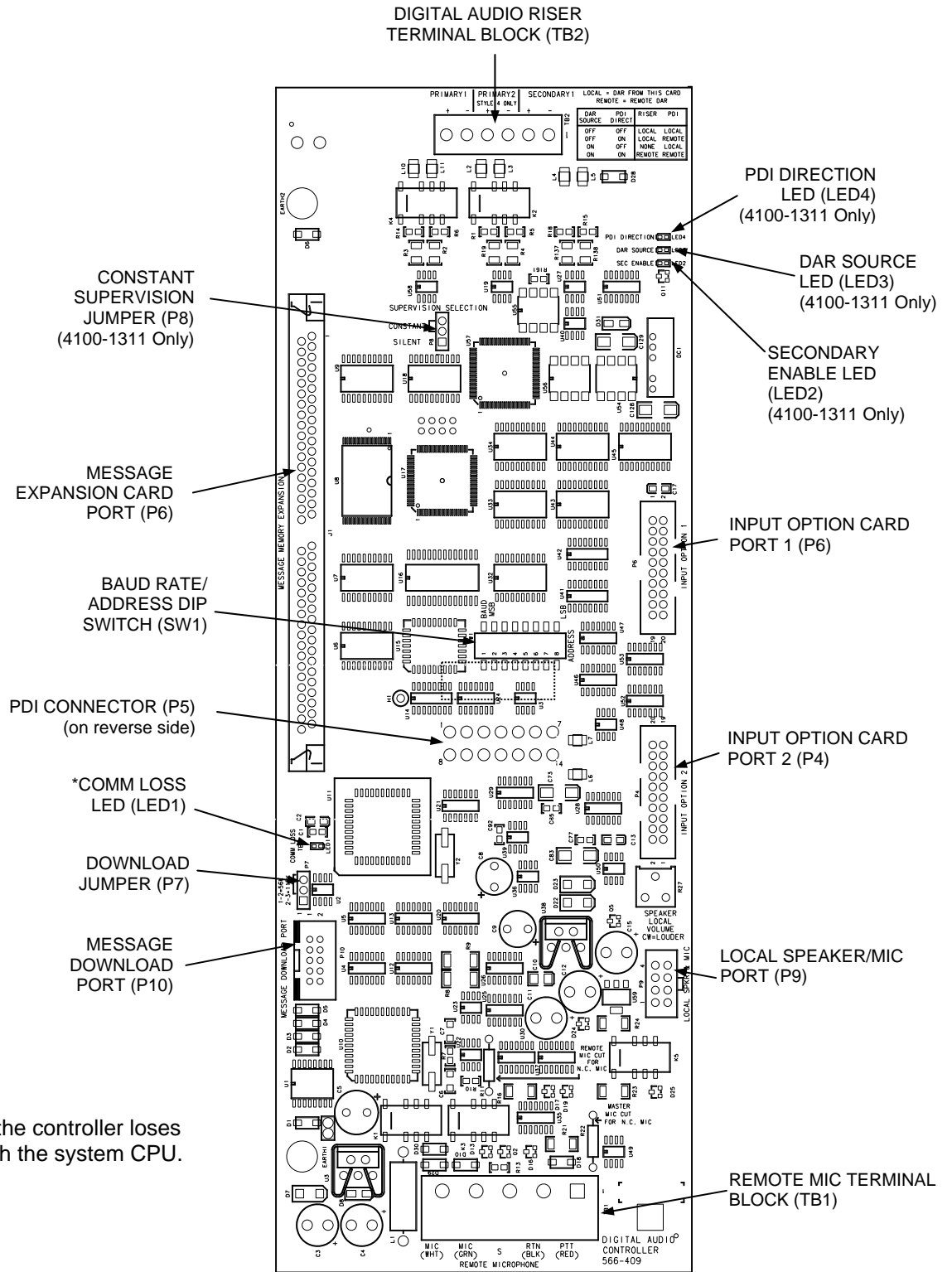


Figure 2. The 4100-1311 Digital Audio Controller

Audio Controller Card Specifications

The analog and digital audio controller both use 24 V card power for riser amps and for microphone supervision. All card logic and low-level analog circuitry is powered from the on-board buck regulator (at 5 V).

The following specifications apply to analog and digital audio controllers.

Minimum input voltage: 19 VDC
 Maximum input voltage: 33 VDC
 Maximum ripple: 1 VRMS at 120 Hz

Analog current draw:

	At 24 VDC	Maximum Over Range
Current Draw (Quiescent of PCA, no conditions below)	225 mA	290 mA
Additional Current draw factors (add to above number for total card current draw)		
Local Speaker On - Silence	50 mA	50 mA
Local Speaker On - Min Volume (Horn Tone, 500Hz Square Wave)	75 mA	90 mA
Local Speaker On - Half Volume (Horn Tone, 500Hz Square Wave)	190 mA	190 mA
Local Speaker On - Full Volume (Horn Tone, 500Hz Square Wave)	330 mA	330 mA
Local or Remote Microphone Enabled (Each)	30 mA	40 mA

Digital current draw:

	At 24 VDC	Maximum Over Range
Current Draw (Quiescent of PCA, no conditions below)	85 mA	100 mA
Additional Current draw factors (add to above number for total card current draw)		
Local Speaker On - Silence	50 mA	50 mA
Local Speaker On - Min Volume (Horn Tone, 500Hz Square Wave)	75 mA	90 mA
Local Speaker On - Half Volume (Horn Tone, 500Hz Square Wave)	190 mA	190 mA
Local Speaker On - Full Volume (Horn Tone, 500Hz Square Wave)	330 mA	330 mA
Local or Remote Microphone Enabled (Each)	30 mA	40 mA

The equipment operates normally with ambient temperatures outside the cabinet from 32° to 120° F (0° to 49° C), inclusive.

The equipment operates normally under non-condensing humidity conditions up to 93% relative humidity at 90° F (32° C).

Configuring the Audio Controller Card

Overview

This section describes how to configure the audio controller card. Configuration is the same for analog and digital audio controllers except where indicated.

Configuring the Download Speed

A jumper is used to select the download speed from the FACP programmer.

Use jumper **P8** on the analog audio controller.

Use jumper **P7** on the digital audio controller.

- Position 1-2: Download speed = 56 K
- Position 2-3: Download speed = 115 K (*default*)

Configuring the Supervision Mode (4100-1311 Digital Audio Controller Only)

A jumper is used to configure the Digital Audio Controller for backward compatibility.

Use jumper **P8** to set the compatibility mode.

- Position 1-2: Silence Supervision (used for backward compatibility when the card is used as a retrofit or replacement in systems having Digital Audio Riser Interface Cards [566-243] or a Digital Audio Controller [4100-1211]).
- Position 2-3: Constant Supervision (*default*) (used in current systems or systems being retrofitted for constant supervision where all 566-243 Digital Audio Riser Interface Cards [DARICs] and 4100-1211 Digital Audio Controllers [DACs] are being replaced with later versions [566-407 for DARICs & 4100-1311 for DACs])

Setting the Address

The device address is set via DIP switch SW1, which is a bank of eight switches. From left to right (see Figure 3) these switches are designated as SW1-1 through SW1-8. The function of these switches is as follows:

- **SW1-1.** This switch sets the baud rate for the internal 4100 communications line running between the card and the CPU. Set this switch to ON.
- **SW1-2 through SW1-8.** These switches set the card's address within the FACP. Refer to Table 2 for a complete list of the switch settings for all of the possible card addresses.

Notes:

- You must set these switches to the value assigned to the card by the Programmer.
- The SW1 setting applies to audio controller slaves, including audio input cards.

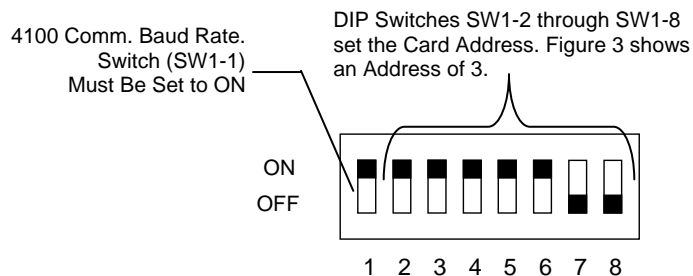


Figure 3. DIP Switch SW1

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Configuring the Audio Controller Card, *Continued*

Setting the Address,

Table 2. Card Addresses

Address	SW 1-2	SW 1-3	SW 1-4	SW 1-5	SW 1-6	SW 1-7	SW 1-8	Address	SW 1-2	SW 1-3	SW 1-4	SW 1-5	SW 1-6	SW 1-7	SW 1-8
1	ON	ON	ON	ON	ON	ON	OFF	61	ON	OFF	OFF	OFF	OFF	ON	OFF
2	ON	ON	ON	ON	ON	OFF	ON	62	ON	OFF	OFF	OFF	OFF	OFF	ON
3	ON	ON	ON	ON	ON	OFF	OFF	63	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	ON	ON	ON	ON	OFF	ON	ON	64	OFF	ON	ON	ON	ON	ON	ON
5	ON	ON	ON	ON	OFF	ON	OFF	65	OFF	ON	ON	ON	ON	ON	OFF
6	ON	ON	ON	ON	OFF	OFF	ON	66	OFF	ON	ON	ON	ON	OFF	ON
7	ON	ON	ON	ON	OFF	OFF	OFF	67	OFF	ON	ON	ON	ON	OFF	OFF
8	ON	ON	ON	OFF	ON	ON	ON	68	OFF	ON	ON	ON	OFF	ON	ON
9	ON	ON	ON	OFF	ON	ON	OFF	69	OFF	ON	ON	ON	OFF	ON	OFF
10	ON	ON	ON	OFF	ON	OFF	ON	70	OFF	ON	ON	ON	OFF	OFF	ON
11	ON	ON	ON	OFF	ON	OFF	OFF	71	OFF	ON	ON	ON	OFF	OFF	OFF
12	ON	ON	ON	OFF	OFF	ON	ON	72	OFF	ON	ON	OFF	ON	ON	ON
13	ON	ON	ON	OFF	OFF	ON	OFF	73	OFF	ON	ON	OFF	ON	ON	OFF
14	ON	ON	ON	OFF	OFF	OFF	ON	74	OFF	ON	ON	OFF	ON	OFF	ON
15	ON	ON	ON	OFF	OFF	OFF	OFF	75	OFF	ON	ON	OFF	ON	OFF	OFF
16	ON	ON	OFF	ON	ON	ON	ON	76	OFF	ON	ON	OFF	OFF	ON	ON
17	ON	ON	OFF	ON	ON	ON	OFF	77	OFF	ON	ON	OFF	OFF	ON	OFF
18	ON	ON	OFF	ON	ON	OFF	ON	78	OFF	ON	ON	OFF	OFF	OFF	ON
19	ON	ON	OFF	ON	ON	OFF	OFF	79	OFF	ON	ON	OFF	OFF	OFF	OFF
20	ON	ON	OFF	ON	OFF	ON	ON	80	OFF	ON	OFF	ON	ON	ON	ON
21	ON	ON	OFF	ON	OFF	ON	OFF	81	OFF	ON	OFF	ON	ON	ON	OFF
22	ON	ON	OFF	ON	OFF	OFF	ON	82	OFF	ON	OFF	ON	ON	OFF	ON
23	ON	ON	OFF	ON	OFF	OFF	OFF	83	OFF	ON	OFF	ON	ON	OFF	OFF
24	ON	ON	OFF	OFF	ON	ON	ON	84	OFF	ON	OFF	ON	OFF	ON	ON
25	ON	ON	OFF	OFF	ON	ON	OFF	85	OFF	ON	OFF	ON	OFF	ON	OFF
26	ON	ON	OFF	OFF	ON	OFF	ON	86	OFF	ON	OFF	ON	OFF	OFF	ON
27	ON	ON	OFF	OFF	ON	OFF	OFF	87	OFF	ON	OFF	ON	OFF	OFF	OFF
28	ON	ON	OFF	OFF	OFF	ON	ON	88	OFF	ON	OFF	OFF	ON	ON	ON
29	ON	ON	OFF	OFF	OFF	ON	OFF	89	OFF	ON	OFF	OFF	ON	ON	OFF
30	ON	ON	OFF	OFF	OFF	OFF	ON	90	OFF	ON	OFF	OFF	ON	OFF	ON
31	ON	ON	OFF	OFF	OFF	OFF	OFF	91	OFF	ON	OFF	OFF	ON	OFF	OFF
32	ON	OFF	ON	ON	ON	ON	ON	92	OFF	ON	OFF	OFF	OFF	ON	ON
33	ON	OFF	ON	ON	ON	ON	OFF	93	OFF	ON	OFF	OFF	OFF	ON	OFF
34	ON	OFF	ON	ON	ON	OFF	ON	94	OFF	ON	OFF	OFF	OFF	OFF	ON
35	ON	OFF	ON	ON	ON	OFF	OFF	95	OFF	ON	OFF	OFF	OFF	OFF	OFF
36	ON	OFF	ON	ON	OFF	ON	ON	96	OFF	OFF	ON	ON	ON	ON	ON
37	ON	OFF	ON	ON	OFF	ON	OFF	97	OFF	OFF	ON	ON	ON	ON	OFF
38	ON	OFF	ON	ON	OFF	OFF	ON	98	OFF	OFF	ON	ON	ON	OFF	ON
39	ON	OFF	ON	ON	OFF	OFF	OFF	99	OFF	OFF	ON	ON	ON	OFF	OFF
40	ON	OFF	ON	OFF	ON	ON	ON	100	OFF	OFF	ON	ON	OFF	ON	ON
41	ON	OFF	ON	OFF	ON	ON	OFF	101	OFF	OFF	ON	ON	OFF	ON	OFF
42	ON	OFF	ON	OFF	ON	OFF	ON	102	OFF	OFF	ON	ON	OFF	OFF	ON
43	ON	OFF	ON	OFF	ON	OFF	OFF	103	OFF	OFF	ON	ON	OFF	OFF	OFF
44	ON	OFF	ON	OFF	OFF	ON	ON	104	OFF	OFF	ON	OFF	ON	ON	ON
45	ON	OFF	ON	OFF	OFF	ON	OFF	105	OFF	OFF	ON	OFF	ON	ON	OFF
46	ON	OFF	ON	OFF	OFF	OFF	ON	106	OFF	OFF	ON	OFF	ON	OFF	ON
47	ON	OFF	ON	OFF	OFF	OFF	OFF	107	OFF	OFF	ON	OFF	ON	OFF	OFF
48	ON	OFF	OFF	ON	ON	ON	ON	108	OFF	OFF	ON	OFF	OFF	ON	ON
49	ON	OFF	OFF	ON	ON	ON	OFF	109	OFF	OFF	ON	OFF	OFF	ON	OFF
50	ON	OFF	OFF	ON	ON	ON	OFF	110	OFF	OFF	ON	OFF	OFF	OFF	ON
51	ON	OFF	OFF	ON	ON	OFF	OFF	111	OFF	OFF	ON	OFF	OFF	OFF	OFF
52	ON	OFF	OFF	ON	OFF	ON	ON	112	OFF	OFF	OFF	ON	ON	ON	ON
53	ON	OFF	OFF	ON	OFF	ON	OFF	113	OFF	OFF	OFF	ON	ON	ON	OFF
54	ON	OFF	OFF	ON	OFF	OFF	ON	114	OFF	OFF	OFF	ON	ON	OFF	ON
55	ON	OFF	OFF	ON	OFF	OFF	OFF	115	OFF	OFF	OFF	ON	ON	OFF	OFF
56	ON	OFF	OFF	OFF	ON	ON	ON	116	OFF	OFF	OFF	ON	OFF	ON	ON
57	ON	OFF	OFF	OFF	ON	ON	OFF	117	OFF	OFF	OFF	ON	OFF	ON	OFF
58	ON	OFF	OFF	OFF	ON	OFF	ON	118	OFF	OFF	OFF	ON	OFF	OFF	ON
59	ON	OFF	OFF	OFF	ON	OFF	OFF	119	OFF	OFF	OFF	ON	OFF	OFF	OFF
60	ON	OFF	OFF	OFF	OFF	ON	ON								

Installing the Audio Controller onto the PDI

The audio controller assembly is designed to be mounted on the PDI in an FACP expansion bay. The card should be mounted onto the leftmost side of the PDI.

Use the connector on the back side of the audio controller card to connect to the left side of the bay as shown in Figure 4.

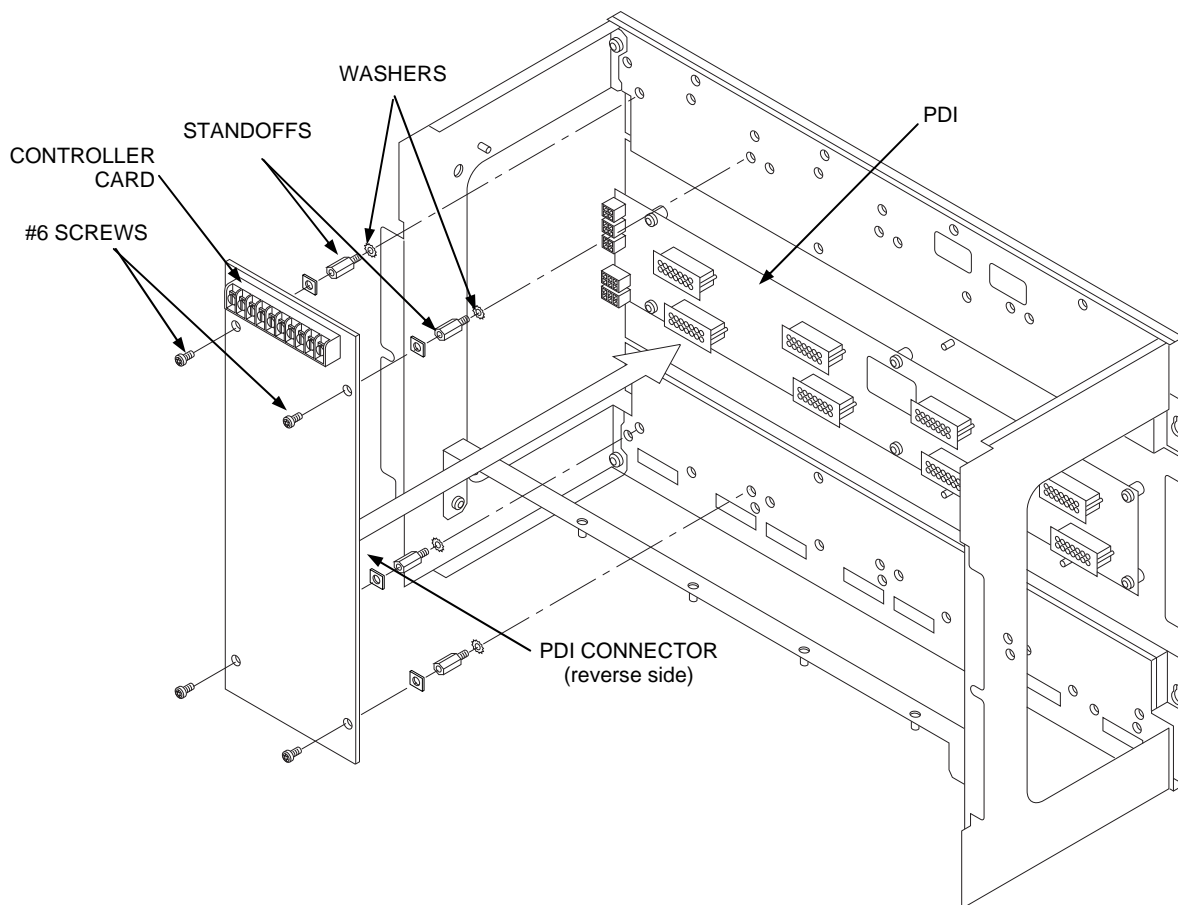


Figure 4. Mounting onto the Power Distribution Interface

Audio Controller Field Wiring

Overview

This section contains the field wiring drawings for the analog and digital audio controllers. Input Option Card, Remote Mic, and Line Level wiring diagrams are valid for both the Analog and Digital Controllers.

Note: Use supplied ferrite beads with digital audio controllers. Loop wires once through the supplied ferrite bead(s) as shown in Figure 5.

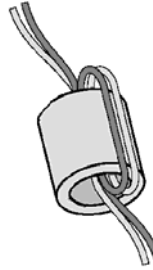


Figure 5. Loop Wires As Shown.

Audio Input Card Interconnections

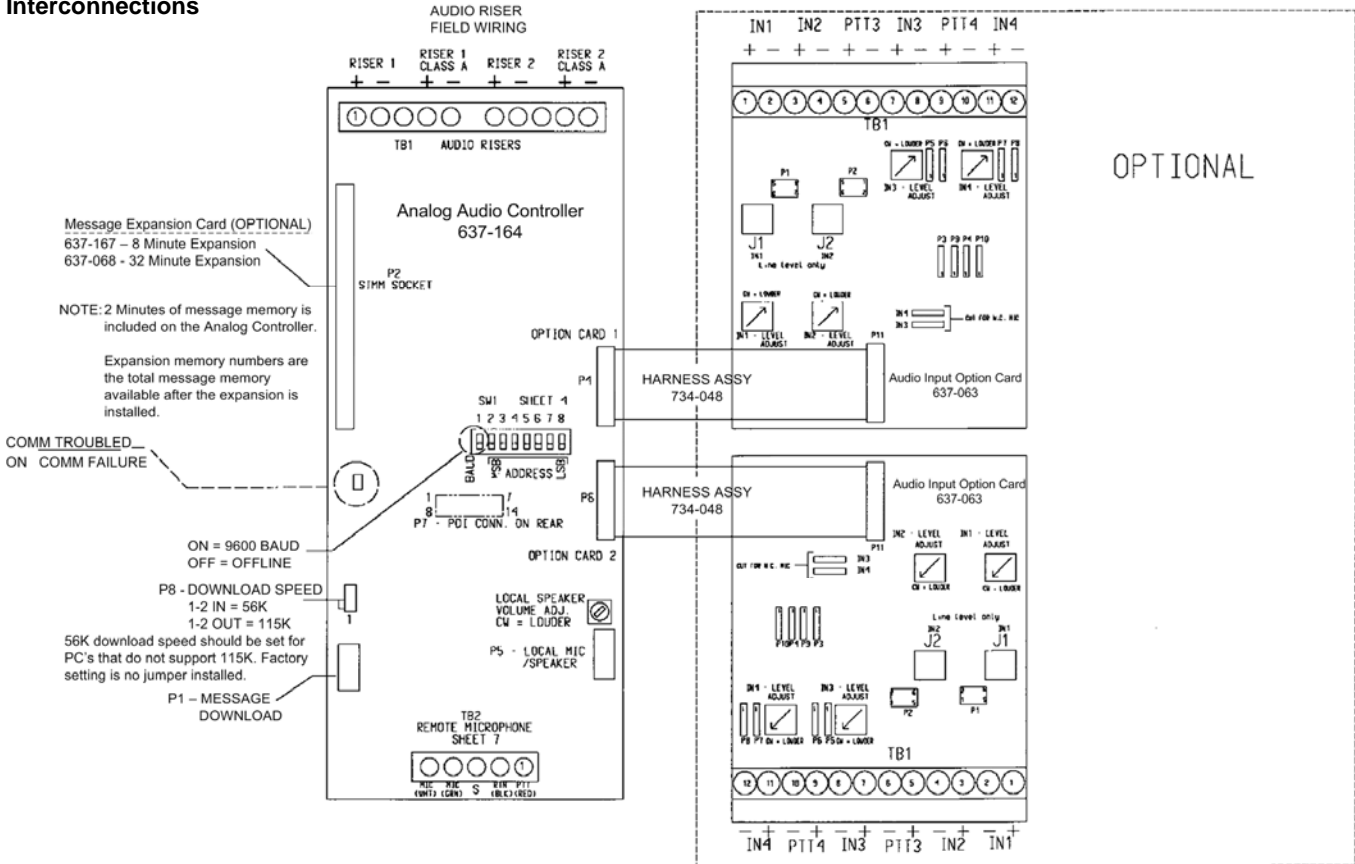


Figure 6. Audio Input Card Interconnections

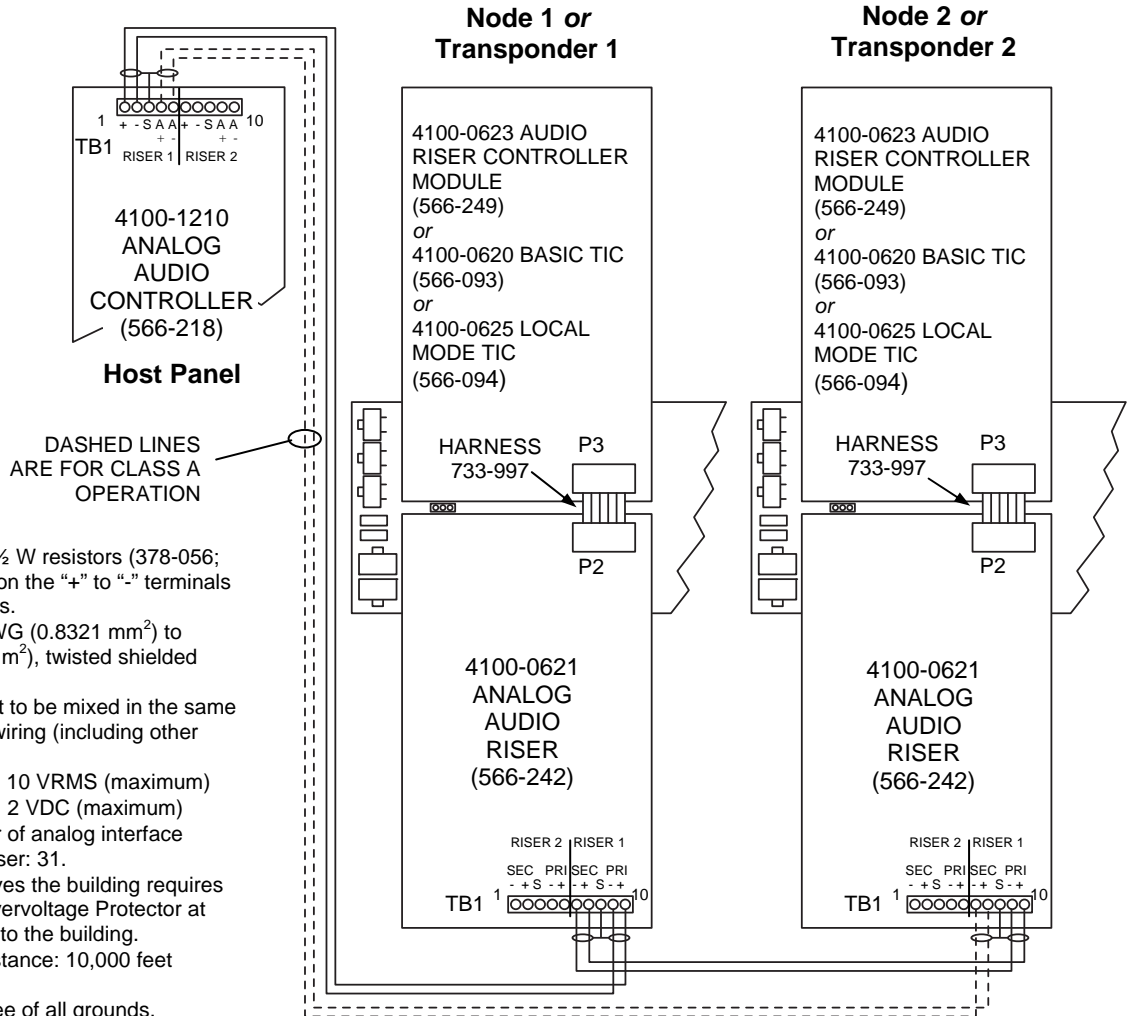
Note: Refer to the *Fire Alarm System Audio Input Card Installation Instructions* (579-160) for information on the audio input card.

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Audio Controller Field Wiring, *Continued*

Analogue Interconnections

Figure 7 is an illustration of Class A and Class B wiring from the analog audio controller to analog risers.



- Leave the 4.7 K, ½ W resistors (378-056; yellow/violet/red) on the “+” to “-” terminals of unused contacts.
- All wiring is 18 AWG (0.8321 mm²) to 14 AWG (2.081 mm²), twisted shielded pair.
- Audio wiring is not to be mixed in the same jacket with other wiring (including other audio wiring).
- AC voltage rating: 10 VRMS (maximum)
- DC voltage rating: 2 VDC (maximum)
- Maximum number of analog interface cards per audio riser: 31.
- All wiring that leaves the building requires the 2081-9044 Overvoltage Protector at each entry or exit to the building.
- Maximum wire distance: 10,000 feet (3,048 m).
- Wiring must be free of all grounds.
- Set audio input card jumpers as shown in “Configuring the Audio Input Card.”
- All riser wiring is supervised and power-limited.

Figure 7. Analog Interconnections

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Audio Controller Field Wiring, *Continued*

Connecting the Analog Riser to Legacy 4100

The FACP may be connected to the 4100 Legacy Audio Controller via the FACP Audio Riser and the Network input on the Legacy Controller. The FACP uses a 10VRMS Analog Audio riser. In order to interface to a legacy 4100 Audio Controller Network input, an isolation/step-down transformer must be used. This is an existing product, the Audio Isolator Assembly, PN 742-302. The setup is slightly different from the instructions that are supplied with the module. Following are the modified installation instructions:

1. Connect the incoming nominal 10 VRMS FACP Audio Riser wiring to TB1 on the audio isolator. If the installation requires IN and OUT wiring, two wires may be installed under each screw of TB1.
Note: The in and out wiring must be two separate wires. Do not loop the wire around the TB1 screws.
2. If there is only one audio wire pair coming into the panel, isolate and tape back the shield with high quality electrical tape.
3. If the installation requires IN and OUT wiring, install as indicated in Step 1 above, connect the shields of the incoming and outgoing wires together to maintain continuity of the shield. The preferable method is to twist the shields together, solder and cover with a high quality electrical tape.

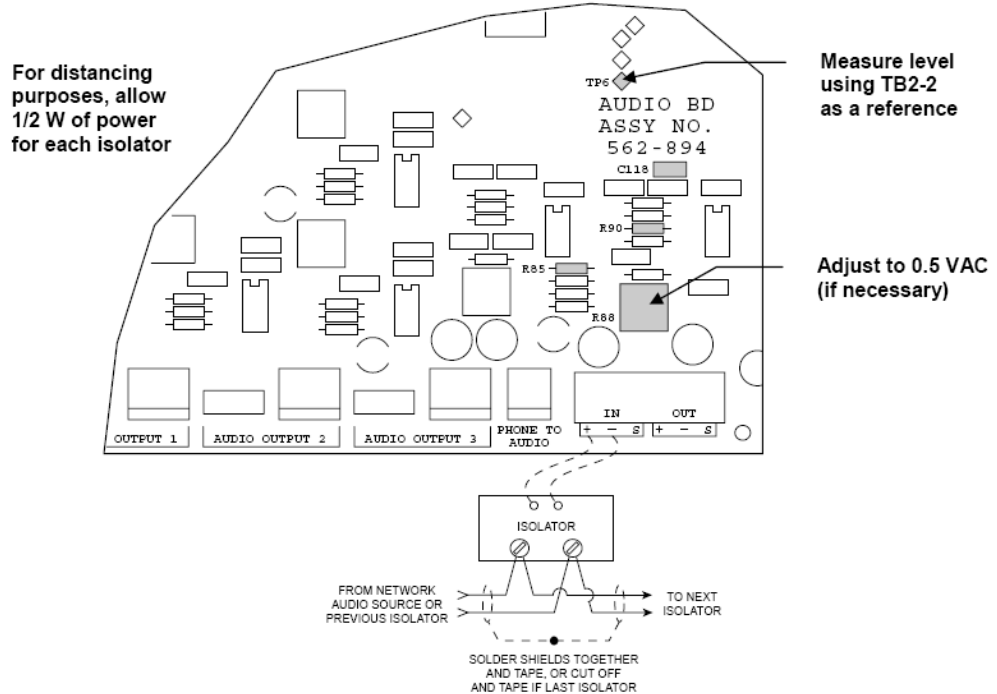


Figure 8. Audio Board Controller Configuration

Aligning the Audio Controller

Follow Steps 1 through 5 and Figure 8 to properly align the audio controller board after installing the audio isolator.

1. Ensure the jumper wire on the isolator assembly is connected to Post D.
2. Remove R85, R90, and C118 from the Audio Controller Board (562-894).
3. Verify there is a nominal 10 VRMS riser supervisory signal (1Khz Sine Wave) into the isolator.
4. Using the AC scale of an appropriate meter (e.g., Fluke 12, Fluke 75) measure the level at TP6 using TB2-2 of the audio controller as a reference.
5. If needed, adjust R88 on the audio controller for a level of 0.5 VAC.

Audio Controller Field Wiring, *Continued*

Amplifier and Harness Connections

The low level (1Vp-p) audio output from the legacy controller to the local amplifiers must be converted from an unbalanced signal to a balanced signal in order to pass the distortion requirements for this configuration. This is accomplished by a new Isolation Transformer harness, PN 0734-231. If there is more than one amplifier on a channel, additional isolator harnesses must be added between each link in the audio distribution. If the Legacy Controller uses two channel audio, isolation harness's will be required for the second channel. See Fig. 10:

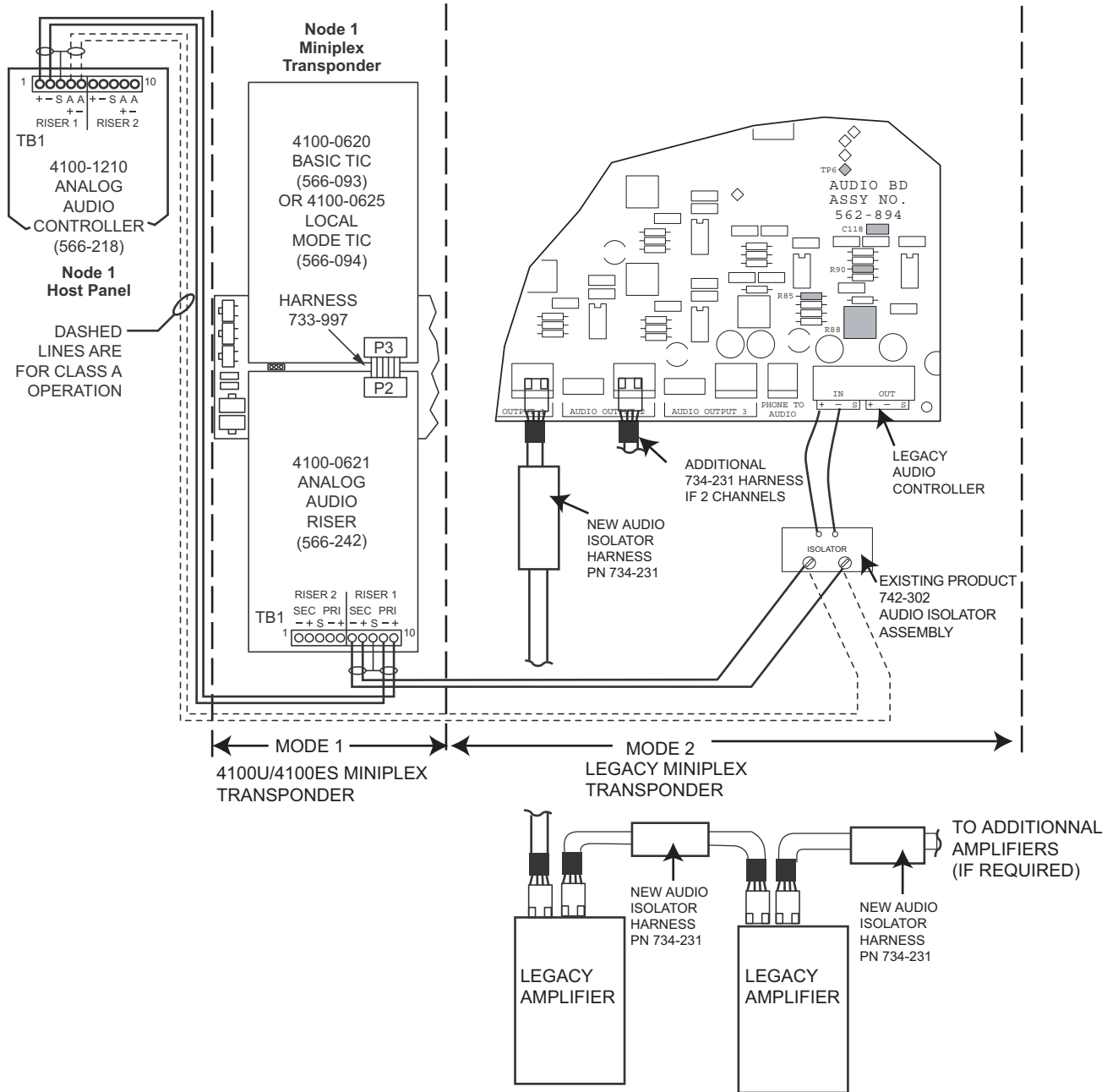
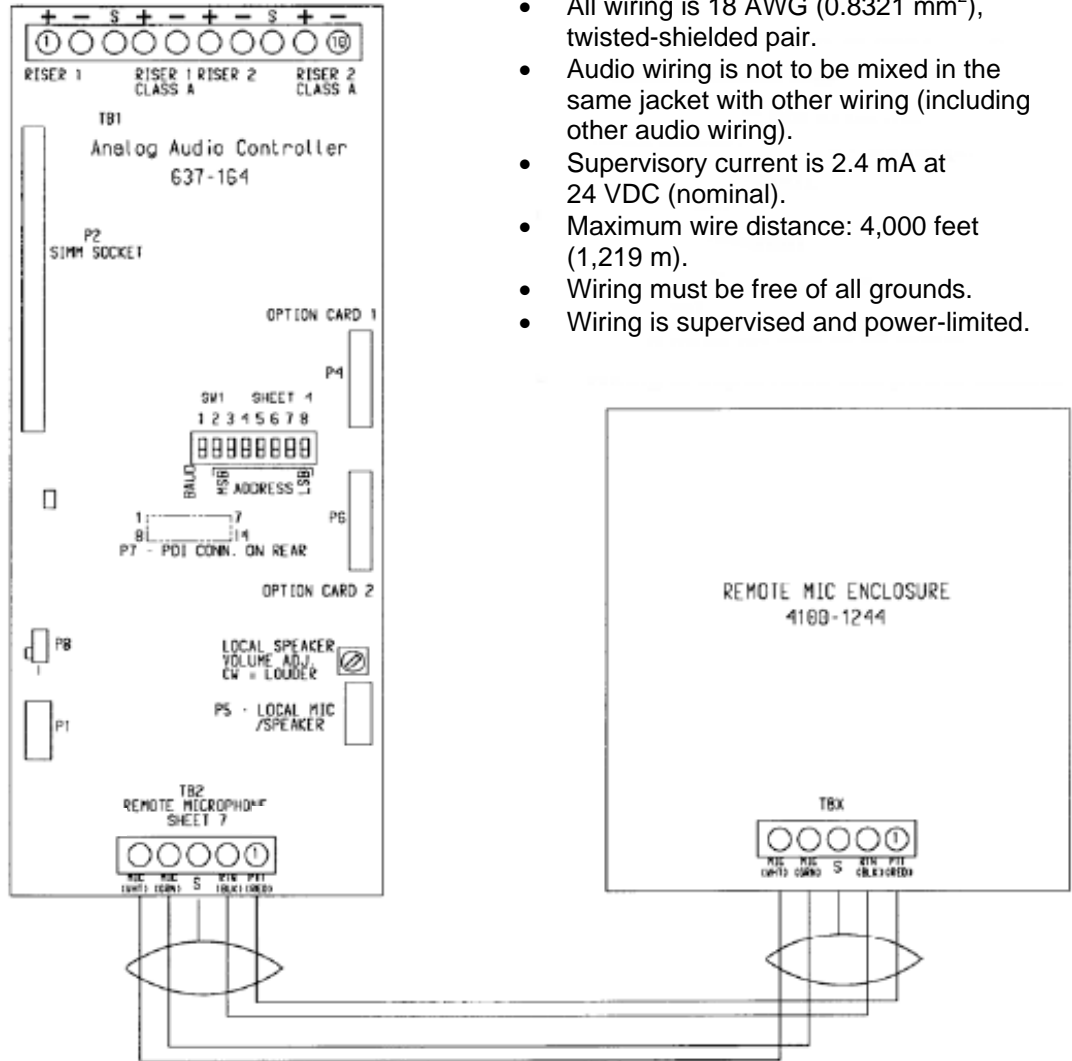


Figure 9. Amplifier and Harness Connections

Audio Controller Field Wiring, *Continued*

Remote Mic Interconnections



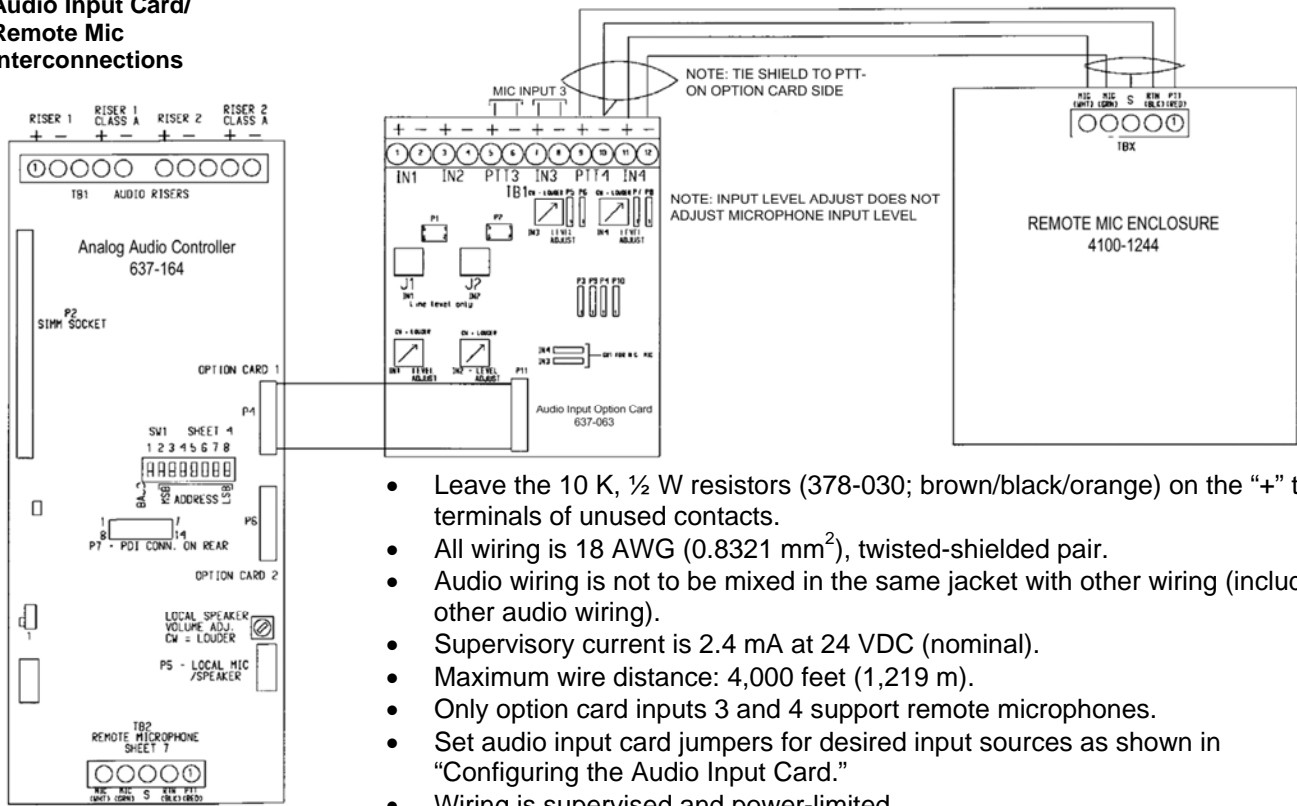
- Leave the 10 K, ½ W resistors (378-030; brown/black/orange) on the “+” to “-” terminals of unused contacts.
- All wiring is 18 AWG (0.8321 mm²), twisted-shielded pair.
- Audio wiring is not to be mixed in the same jacket with other wiring (including other audio wiring).
- Supervisory current is 2.4 mA at 24 VDC (nominal).
- Maximum wire distance: 4,000 feet (1,219 m).
- Wiring must be free of all grounds.
- Wiring is supervised and power-limited.

Figure 10. Remote Mic Interconnections

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Audio Controller Field Wiring, *Continued*

Audio Input Card/ Remote Mic Interconnections



- Leave the 10 K, ½ W resistors (378-030; brown/black/orange) on the “+” to “-” terminals of unused contacts.
- All wiring is 18 AWG (0.8321 mm²), twisted-shielded pair.
- Audio wiring is not to be mixed in the same jacket with other wiring (including other audio wiring).
- Supervisory current is 2.4 mA at 24 VDC (nominal).
- Maximum wire distance: 4,000 feet (1,219 m).
- Only option card inputs 3 and 4 support remote microphones.
- Set audio input card jumpers for desired input sources as shown in “Configuring the Audio Input Card.”
- Wiring is supervised and power-limited.

Figure 11. Audio Input Card/Remote Mic Interconnections

Note: Refer to the *Fire Alarm System Audio Input Card Installation Instructions* (579-160) for information on the audio input card.

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Audio Controller Field Wiring, *Continued*

Audio Input Card/ Line Level Input Interconnections

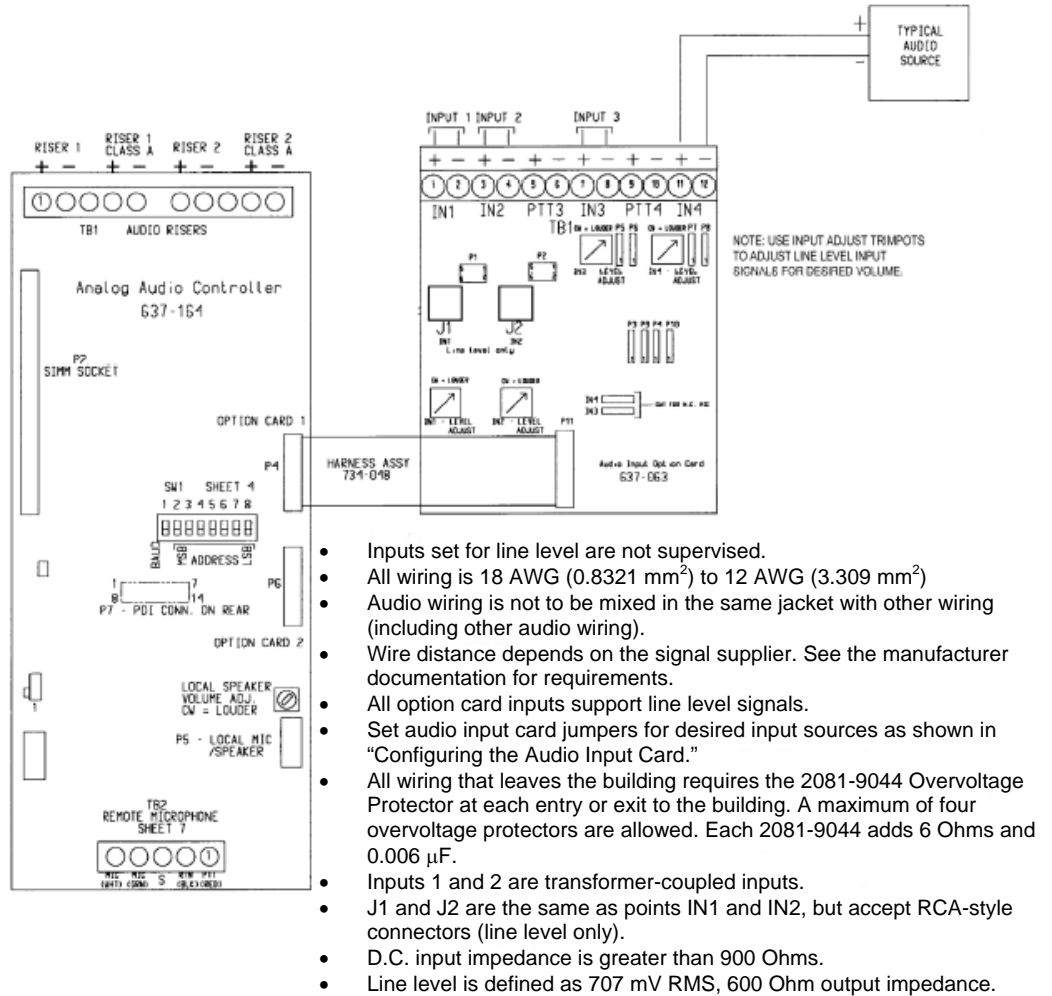


Figure 12. Audio Input Card/Line Level Input Interconnections

Note: Refer to the *Fire Alarm System Audio Input Card Installation Instructions* (579-160) for information on the audio input card.

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Audio Controller Field Wiring, *Continued*

Audio Input Card/ Typical Audio Interconnections

The illustration below shows wiring for a 25 VRMS or 70.7 VRMS input through an audio input option card.

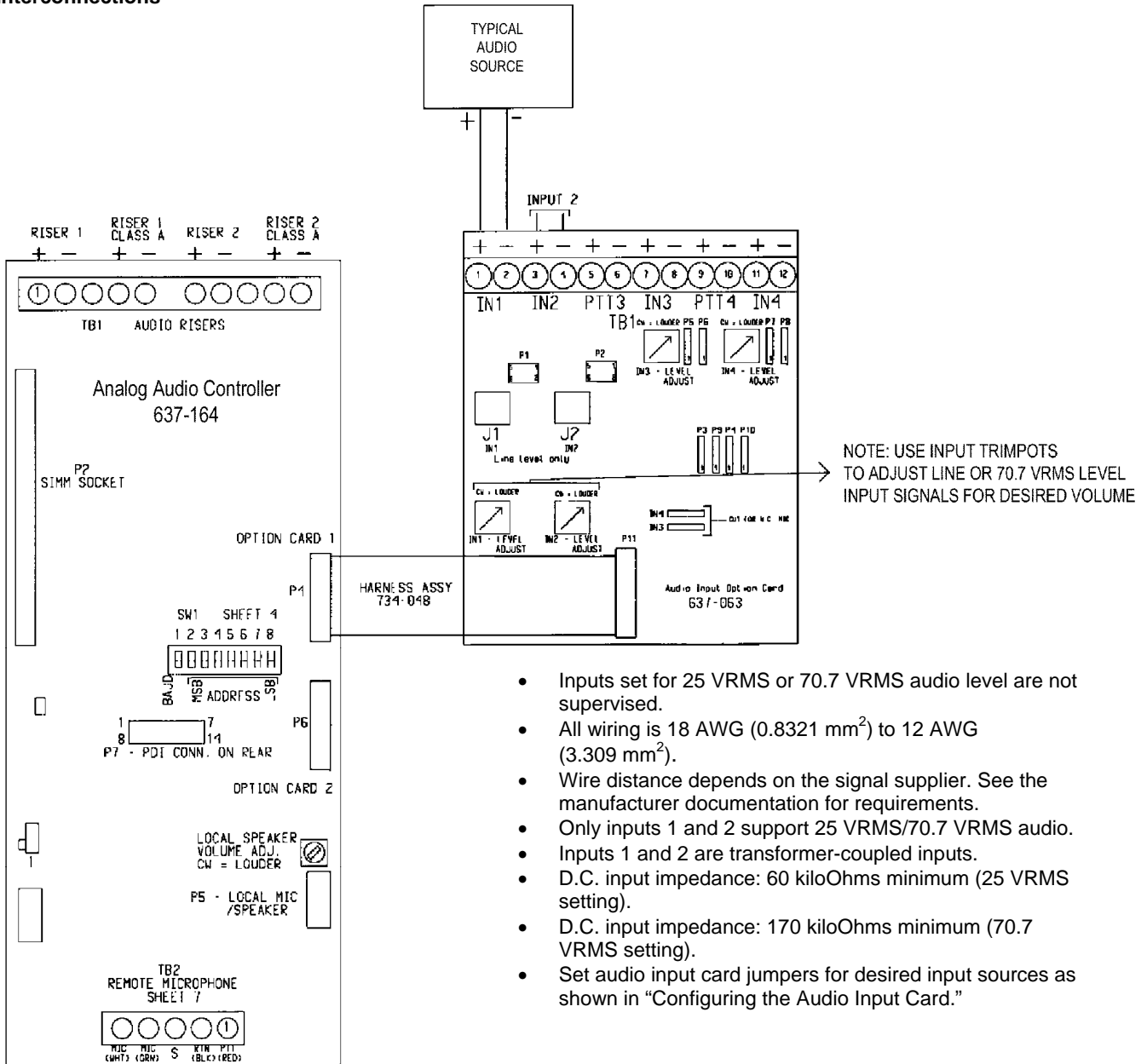


Figure 13. Audio Input Card/Typical Audio Interconnections

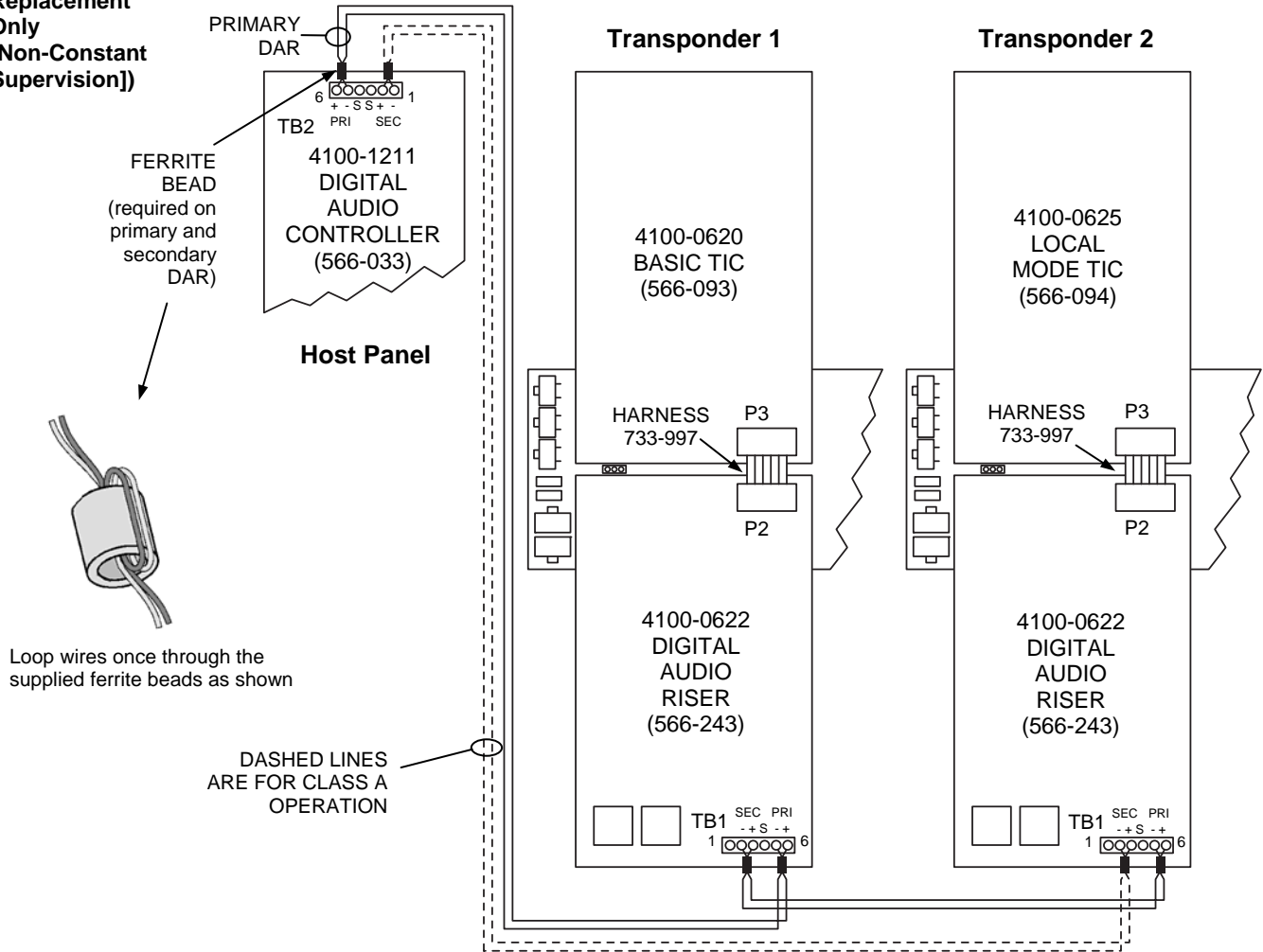
Note: Refer to the *Fire Alarm System Audio Input Card Installation Instructions* (579-160) for information on the audio input card.

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Audio Controller Field Wiring, *Continued*

4100-1211 Digital Audio Controller/ Audio Riser Interconnections (Field Replacement Only [Non-Constant Supervision])

Figure 14 is an illustration of Class A and Class B wiring from the 4100-1211 Digital Audio Controller to the digital audio risers that are in turn connected to TICs for Non-Constant Supervision applications.



1. All wiring is 24 AWG (0.2047 mm²) to 18 AWG (0.8321 mm²), twisted pair.
2. Maximum wire distance: 2,500 feet (762 meters) from digital audio controller primary to the last digital audio riser card.
3. Maximum total line distance and capacitance:
 - 18 AWG (0.8321 mm²): 40 Ohms maximum
0.055 μF maximum
 - 24 AWG (0.2047 mm²): 135 Ohms maximum
0.055 μF maximum
4. All wiring that leaves the building requires the 2081-9044 Overvoltage Protector at each entry or exit to the building. A maximum of four overvoltage protectors are allowed. Each 2081-9044 adds 6 Ohms and 0.006 μF.
5. Wiring must be free of all grounds.
6. Maximum number of digital interface cards per digital audio riser: 31.
7. All riser wiring is supervised and power-limited.
8. Audio wiring is not to be mixed in the same jacket with other wiring (including other audio wiring).

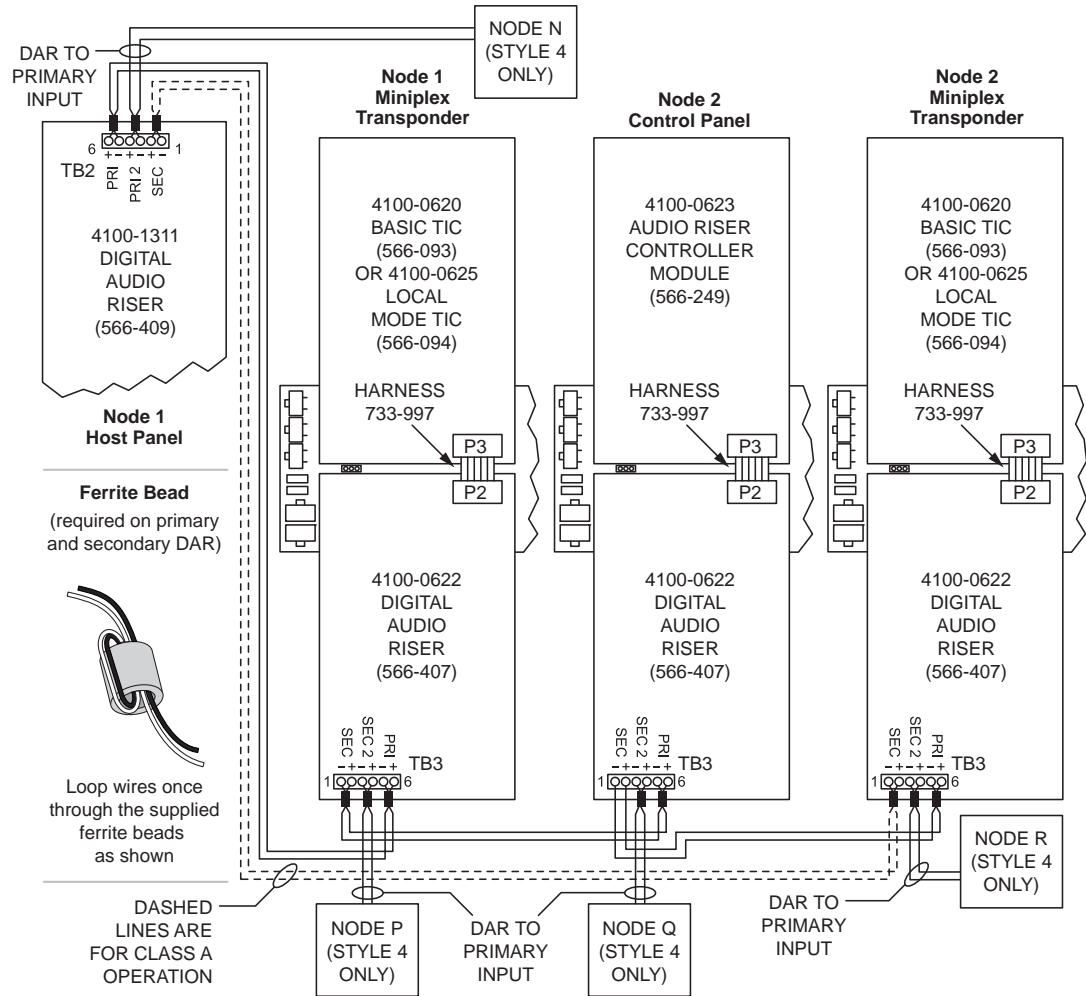
Figure 14. Digital Audio Interconnections (4100-1211 Digital Audio Controller)

Continued on next page

Audio Controller Field Wiring, *Continued*

4100-1311 Digital Audio Controller/ Audio Riser Interconnections (Constant Supervision Applications)

(For Constant Supervision applications with 4100U Master Firmware Revision 11.08 or later) Figure 15 is an illustration of Class A and Class B digital wiring from the 4100-1311 Digital Audio Controller to the digital audio risers connected to TICs or the Network Audio Riser Controller Module.



1. All wiring is 24 AWG (0.2047 mm²) to 18 AWG (0.8321 mm²), twisted pair.
2. Maximum wire distance: 2,500 feet (762 meters) from digital audio controller primary to the primary of the first Digital Audio Riser Interface Card (DARIC).
3. Maximum distance between subsequent nodes: 2,500 feet (762 meters)
4. Maximum line distance and capacitance between nodes:
 - 18 AWG (0.8321 mm²): 40 Ohms maximum, 0.055 μF maximum
 - 24 AWG (0.2047 mm²): 135 Ohms maximum, 0.055 μF maximum
5. All wiring that leaves the building requires the 2081-9044 Overvoltage Protector at each entry or exit to the building. A maximum of four overvoltage protectors are allowed. Each 2081-9044 adds 6 Ohms and 0.006 μF.
6. Wiring must be free of all grounds.
7. Maximum number of digital interface cards per digital audio riser: 31.
8. All riser wiring is supervised and power-limited.
9. Audio wiring is not to be mixed in the same jacket with other wiring (including other audio wiring).

Figure 15. Digital Audio Interconnections (4100-1311 Digital Audio Controller)

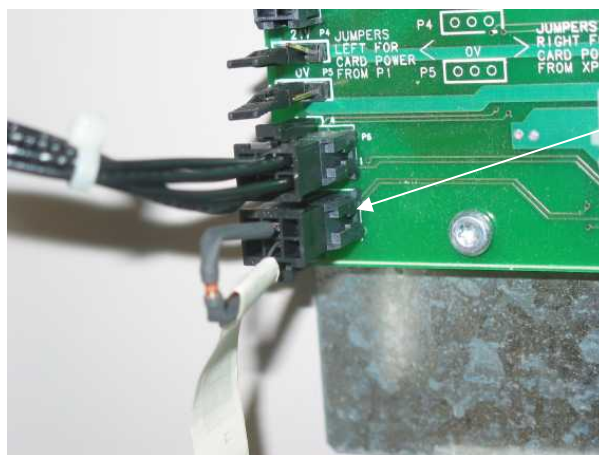
Installing the Digital Audio PDI Termination Plug

Overview

A Digital Audio Riser Termination Plug (734-183) is provided with every Digital Audio Controller or Digital Audio Riser Module. You must use this termination plug to properly terminate the Digital Audio Signal on the PDI.

Installing the Digital Audio PDI Termination Plug

To properly terminate the Digital Audio Signal on the PDI, you must install the termination plug into P7 of the last bay that has Digital Audio. The Digital Audio Controller (or Digital Audio Riser Module) should be the first item and the Digital Audio Termination Plug the last item in the Digital Audio PDI Bay-to-Bay wiring. See Figure 16.



Place the Digital Audio PDI Termination Plug into P7 of the last bay with Digital Audio.

Figure 16. Installing a Digital Audio PDI Termination Plug

Troubleshooting

Overview

This section describes the messages that may appear on the FACP display when using the audio controller cards and their option cards.

Card Missing/Failed

The audio controller card is either not installed or is not at the system address specified by the Programmer.

Wrong Card

The wrong card is using the address specified by the Programmer as the audio controller card.

Message Library Mismatch

The audio message library in the audio card does not match the version of the audio message library used by the scripts in the FACP master controller. This can happen when changes are made to the messages and only the audio card message library or the FACP configuration was downloaded.

Message Memory Card Configuration Trouble

A message memory card is missing from the audio controller, *or* is present while the controller was configured not to have a message memory card.

Message Memory Checksum Failure

Your message memory download was corrupted, your memory expansion card is defective, *or* your digital audio controller is defective. If you receive this message after a download, try downloading again.

Input Option Card Configuration Trouble

An audio input card is missing from either slot 1 or slot 2 next to the audio controller, *or* is present while slot 1 or 2 was configured not to have an audio input card.

Additional Troubles

Additional troubles may be annunciated for shorts or opens on any of the following, each of which is supervised:

- Microphone circuit
 - Analog risers 1 and 2
 - DAR riser (communication failure)
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