SIEMENS

INSTALLATION INSTRUCTIONS
Model VCI2001-U1 Voice Amplifier Card

The Model VCI2001-U1 Voice Amplifier card of the FS20 Voice system provides one speaker zone with two speaker lines and one Class D audio amplifier, capable of operating at either 25 VRMS or 70 VRMS. The Voice Amplifier cards can be configured in either a 1:1 or 1:Many redundancy configurations and can be wired to drive one Class A speaker line, one Class B speaker line, or a dual-interleaved Class B speaker line. The Voice Amplifier cards can also be wired to supervise and power HCPs in one Class A or one Class B configuration. For details, refer to the HCP installation instructions, P/N 315-034860.

FEATURES

The principal features of the VCI2001-U1 include:

- Class D audio power amplifier
- Two selectable output voltages:
  $70V_{rms}$: 85% overall efficiency under full load
  $25V_{rms}$: 80% overall efficiency under full load
- High voltage supply topology
- Standby operation with self-check when idling
- Self-monitored for hardware failures with automatic fallback to degraded operating modes
- Provides supervision of field wiring
- EMC shielded
- Can be used in UL and ULC markets

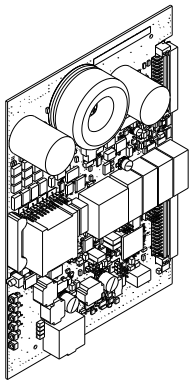


Figure 1
VCI2001-U1
Voice Amplifier Card

PRE-INSTALLATION

Before installing the VCI2001-U1 Amplifier Card into the VCA2002-A1 Card Cage, set the jumpers on the card according to Table 1. See Figure 2 for the jumper locations. Figure 2 illustrates the jumper positions for the 70V configuration (J1 through J4 and J7) with Low Frequency Cutoff not required (US) (J5).

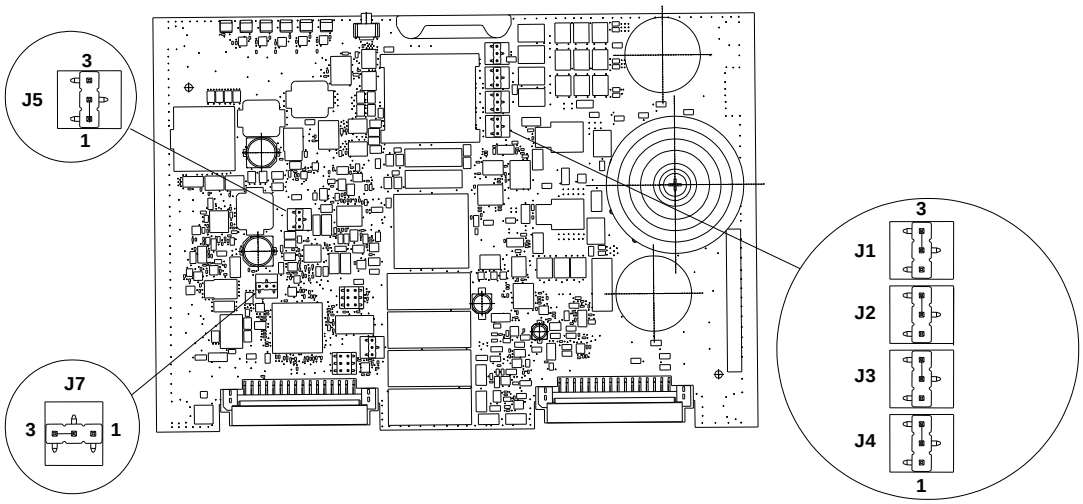


Figure 2
Jumpers on VCI2001-U1 Amplifier Card

Jumper ID	Jumper Position	
	25 Volt Configuration	**70 Volt Configuration**
J1	1-2	2-3
J2	1-2	2-3
J3	1-2	2-3
J4	1-2	2-3
J7	1-2	2-3
Jumper ID	**Low Frequency Cutoff***	
	In Use (Canada)	**Not Used (Elsewhere)**
J5	2-3	1-2

*Low frequency cutoff is required to meet UL in Canada

Table 1
Jumper Settings on VCI2001-U1 Amplifier Card

OPERATION

Please refer to Figure 3. The VCI2001-U1 Voice Amplifier receives control data and digital audio from the VCC2001-A1 Voice CPU Card, converts the digital audio back to analog and amplifies it for broadcast over local loudspeakers. The Voice Amplifier output section includes two identical connections for speaker lines, each of which are capable of supporting one Class A, one Class B, or one Dual-Interleaved Class B speaker line. The Voice Amplifier is protected from short circuit and over-current. The Voice Amplifier circuit supervises the speaker line for short, open circuit and ground fault. The field wiring supervision system uses DC current and an end-of-line resistor in combination with AC-coupled speakers. Ground fault is detected in common for both speaker lines on each Voice Amplifier.

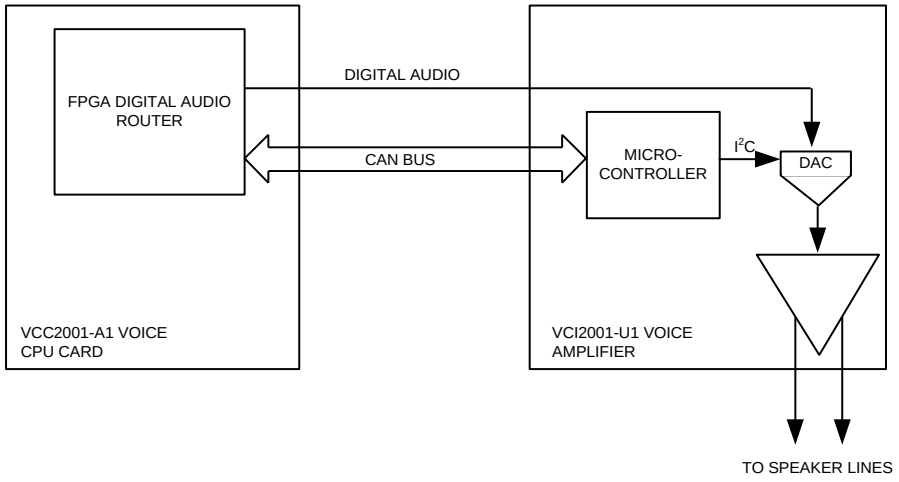


Figure 3
VCI2001-U1 Voice Amplifier Card Signal Flow

Controls and Indicators
The VCI2001-U1 Voice Amplifier operational status is indicated by six LEDs located along the card edge and visible through the Card Cage front cover (see Figure 4). Table 2 defines the LED functions. When the amplifier is inactive, only the green power LED should be turned on. When the amplifier is sending out audio, the red line active LED also turns on. Any of the yellow LEDs being lit indicates a failure of the card or a problem with the wiring connected to it.

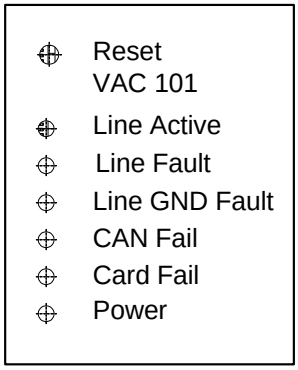


Figure 4
Amplifier LEDs

LED	COLOR	NORMAL STATE	ACTIVE STATE	FAULT CONDITION	DESCRIPTION
Line Active	Red	Off	On		Audio is active at the speaker.
Line Fault	Yellow	Off		On	Check speaker line for open or short condition.
				Flashing	If the LED is flashing slowly (1/sec), the fault is on the speaker line 1. If the LED is flashing quickly (5/sec), the fault is on line 2 (Class B wiring).
Line GND Fault	Yellow	Off		On	Check speaker line for ground fault.
CAN Fail	Yellow	Off		On	Check if VCC is operational.
				Flashing	Mismatch in voltage settings between VCC software selection and the amplifier hardware jumper setting. Refer to Table 1 for hardware settings.
Card Fail	Yellow	Off		On	The card has a hardware fault. To clear a fault press the RESET button. If this does not correct the problem, change the card.
Power	Green	On		Off	Check 24VDC power supply.

Table 2
Amplifier Status LEDs

MOUNTING

Remove electrical power prior to working on equipment.

High Voltage

- **Amplifier card should only be handled by its plastic card handle.**
- **Amplifier card should be placed onto a non-conductive surface once removed from the card cage.**
- **Do not insert hands into the card cage.**

Using the site-specific shop drawings as a guide, install from one to four amplifier cards into the four available amplifier slots (VAC101, VAC102, VAC103 and VAC104) illustrated in Figure 6.

1. Open the inner doors of the FV2025/2050, FV922/FV924 Fire Voice Control Panel.
2. Unscrew the latch on the center-bottom of the Card Cage front cover and slide the cover up until it clears the Card Cage assembly.

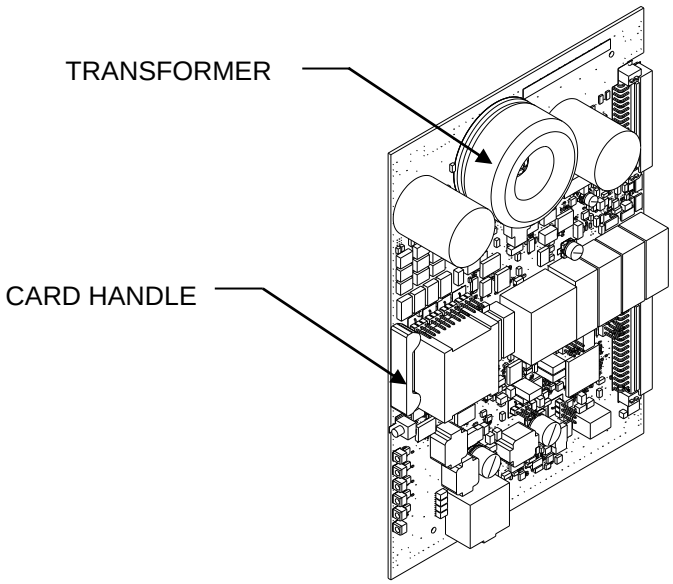


Figure 5
VCI2001-U1 Voice Amplifier Card.

3. Please refer to Figure 5. Holding the VCI2001-U1 so the transformer is on the top of the card, ***gently*** insert the card into the backplane amplifier slots VAC101, VAC102, VAC103, or VAC104 (see Figure 6). Use the raised card guides on the inside of the top and bottom of the Card Cage to guide it into place.

   CAUTION
   When inserting the VCI2001-U1 card into the backplane connector, avoid using the top and bottom of the Card Cage for leverage. Instead, push gently on the center of the molded plastic card handle until the card snaps into place. Be sure that the card is perpendicular to the front of the Card Cage and is positioned between the two indented metal card guides in the top and bottom of the Card Cage. The card needs to be between all three sets of card guides as it is slid into place to correctly mate with the backplane connector.

   WARNING
   To avoid damaging the VCI2001-A1 card or the backplane connector, DO NOT FORCE THE CARD INTO POSITION.

4. Referring to the System Design documentation, repeat Step 3 for each VCI2001-U1 Card required to populate each of the VAC positions on the backplane. Additional VCI2001-U1 Card positioning instructions are provided in the VCA2002-A1 Card Cage Installation Instructions, Document ID A6V10370410.
5. Replace the VCA2002-A1 Card Cage cover by re-inserting it into the top of the cage and sliding it downward until it reaches the bottom of the assembly.
6. Screw the latch back into the Card Cage cover.

Removing the Voice Amplifier Card from the Card Cage

1. First remove power from the card cage.
2. Unscrew the latch on the center-bottom of the VCA2002-A1 Card Cage front cover and slide the cover up.
3. Grip the VCI2001-A1 Card by the molded plastic card handle and pull the card gently out of the backplane connector.
4. Replace the Card Cage cover and tighten the latch.

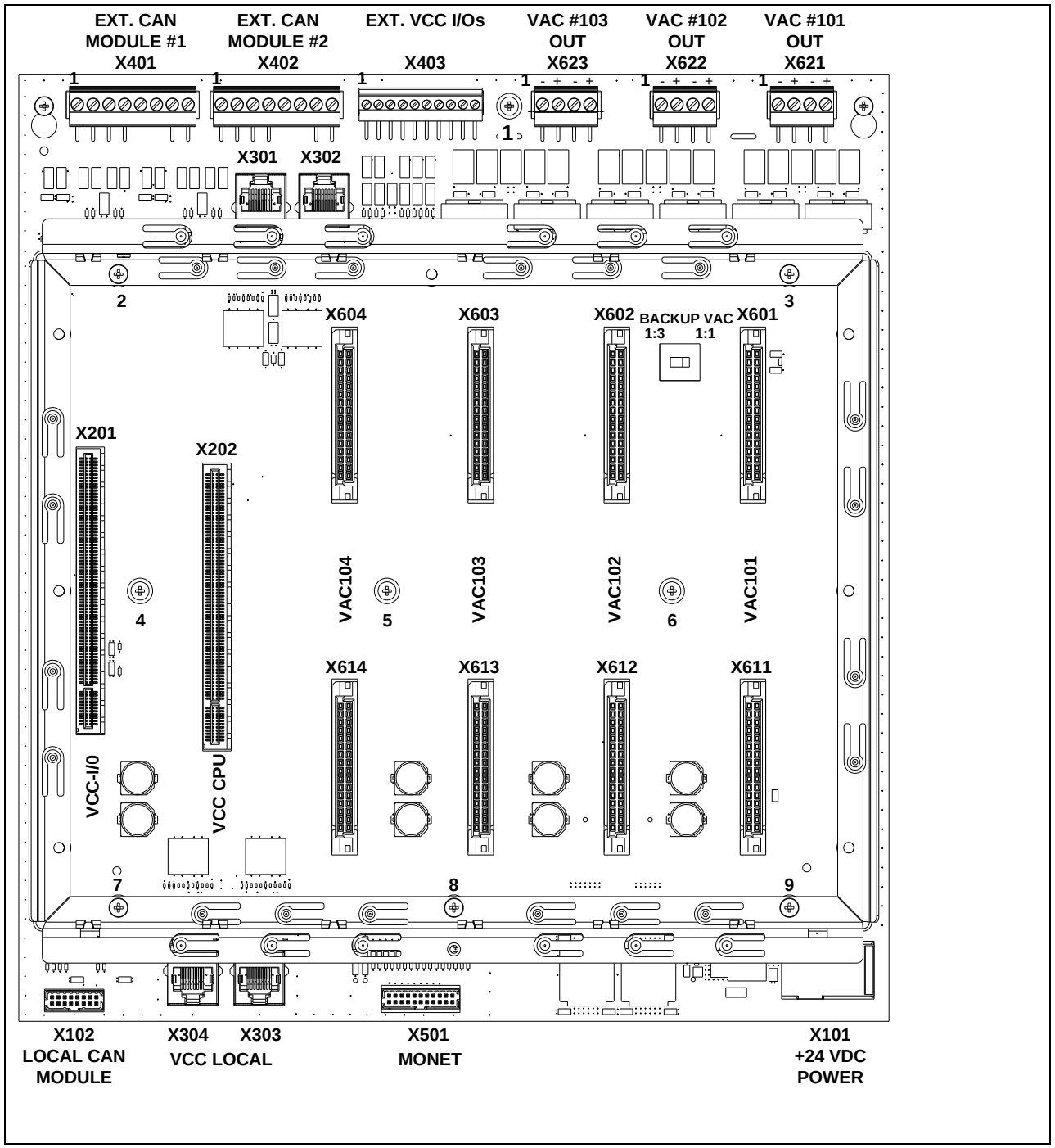


Figure 6

VCA2002-A1 Card Cage with Cover Removed

WIRING

WARNING: Remove electrical power prior to working on equipment.

Terminating Field Wires

Terminate each of the field wires as follows:

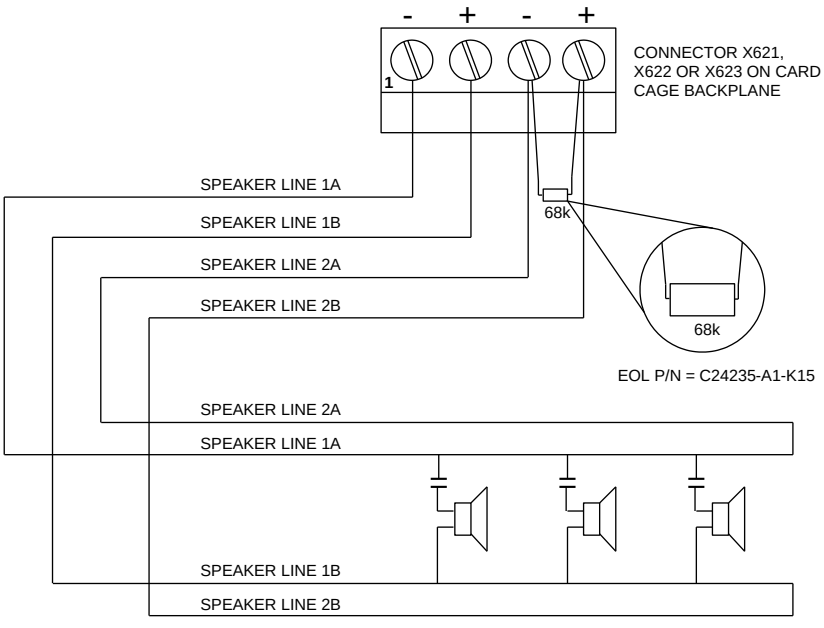
1. Strip approximately ¼ inch of insulation off the end of the wire.
2. Loosen the retaining screw on top of the furnished connector by turning it counterclockwise.
3. Insert the stripped end of the wire into the side of the connector.
4. Tighten the retaining screw by turning it clockwise.

NOTE: The screw terminal can accommodate one 12-18 AWG (Ø 0.5mm -2.5 mm^2).

Field Line Configurations

The voice amplifier is wired into the speaker line circuit through a connector mounted on the card cage backplane. The connector used by the amplifier depends upon which position it is installed in the card cage. Each circuit can be configured either as Class A, Class B or Dual-Interleaved Class B, depending on the site specific shop drawings. Install the end-of-line terminating resistor on the field wiring according to the class of wiring being used as shown in the following selections:

a. For Class A, the speaker line is looped back to the system, and the 68K ohm End-Of- Line (EOL) resistor is connected directly at VCI2001-U1 output terminals 3 and 4, as shown in Figure 7. In this configuration the line continues to operate during an open circuit condition because it is fed from both sides. In the event of a speaker-line short, however, speaker line operation is discontinued.



NOTES FOR SPEAKER LINES

1. USE TWISTED PAIR.
2. SUPERVISED AND POWER LIMITED
3. POSITIVE OR NEGATIVE GROUND FAULT DETECTED AT <10K OHMS FOR TERMINALS 1-4
4. REFER TO TABLE 4 FOR MAXIMUM WIRING RESISTANCES.

Figure 7
Class A Speaker Line Wiring

b. For Class B, the 68K ohm EOL resistor is connected at the end of the speaker line. If only one speaker line is connected to the amplifier, an additional 68K ohm EOL must be connected to the unused amplifier output terminals (see Figure 7). During an open-circuit condition the speaker line does not work or only works partially. This depends upon where the break in the line is. In the event of a speaker-line short, however, speaker-line operation is interrupted.

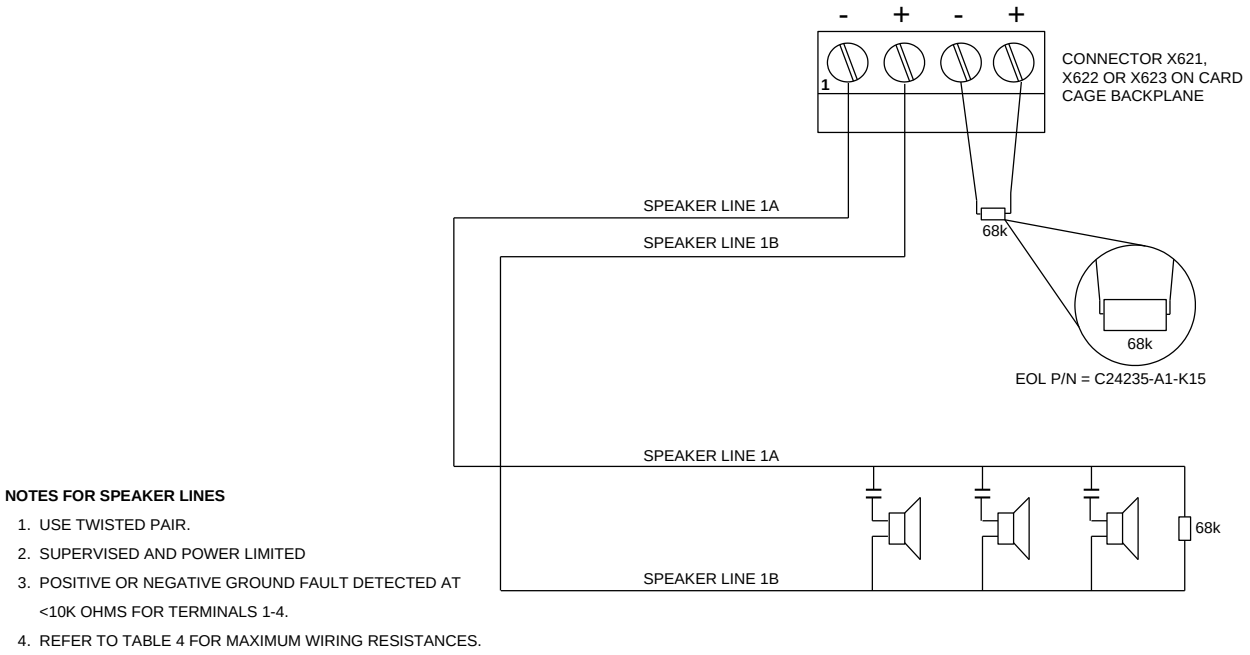


Figure 8
Class B Speaker Line Wiring

c. For Dual Interleaved Class B, a 68K ohm EOL is connected at the end of each of the two interleaved speaker lines (see Figure 8). In this configuration a speaker line does not work or works partially if it is open-circuited. In the event of a speaker-line short, however, the shorted speaker line stops working, but the other unaffected speaker line continues to function normally.

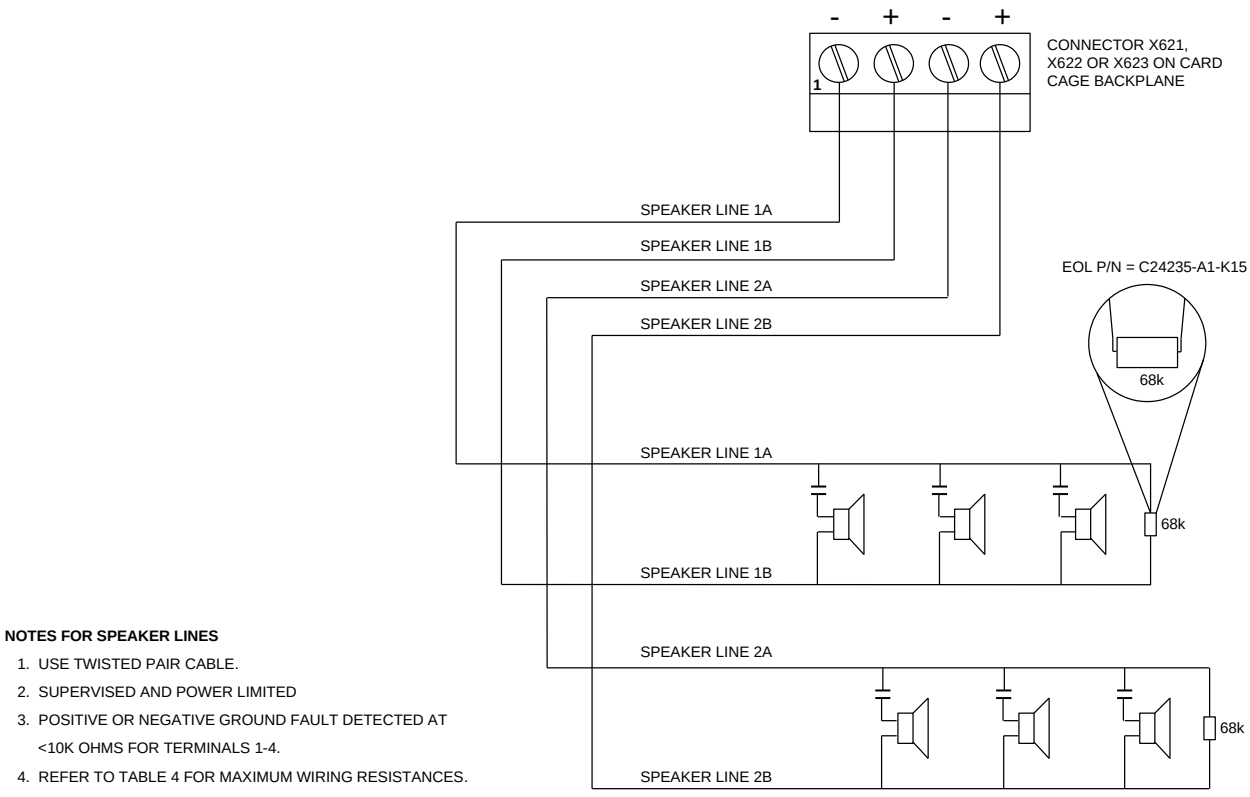


Figure 9
Dual-Interleaved Class B Speaker Line Wiring

Connecting the Field Wires
After the amplifier cards have been installed into the card cage and the field wires have been connected to the speakers as described above, connect the field wires to the mating connectors mounted on the card cage backplane, X621, X622, and X623, according to the VCA2001-A1 Card Cage Installation Instruction, Document ID A6V10380472.

ELECTRICAL RATINGS

Input Power Ratings		
Speaker Line Voltage (V_{rms})	**Power (Watts)**	**24V Input Current (A)**
70V	65	3.2
	50	2.5
	40	2.1
	30	1.6
	20	1.20
	10	0.70
25V	50	2.60
	40	2.20
	30	1.70
	20	1.20
	10	0.70
	Standby Current (A)	
70V	0.330	
25V	0.200	
Running on battery	<0.100	

Table 3
Power Ratings

Resistance (ohms)						
	10W	**20W**	**30W**	**40W**	**50W**	**65W**
25V	12	5.9	3.	2.9	2.4	N/A
70V	94	47	32	23	19	14

NOTE:
All resistances include both wires for each Class B (single or dual) or all four wires for Class A.

Table 4
Maximum Speaker Zone Wire Resistance for 1.5dB Loss

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