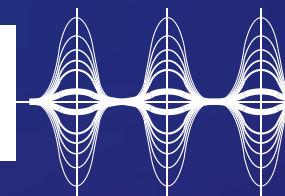


clarion®

APA Amplifiers



APA250/APA450/APA2001



Owner/Installation Manual

clarion®

661 W. Redondo Beach Blvd.
Gardena, CA 90247
1-800-GO CLARION
www.clarion.com

APPLICATIONS

The Clarion APA250 2-channel car audio amplifier can be used in a variety of system applications. Here are some examples to help plan your own installation.

Bridged-Mono Subwoofer System

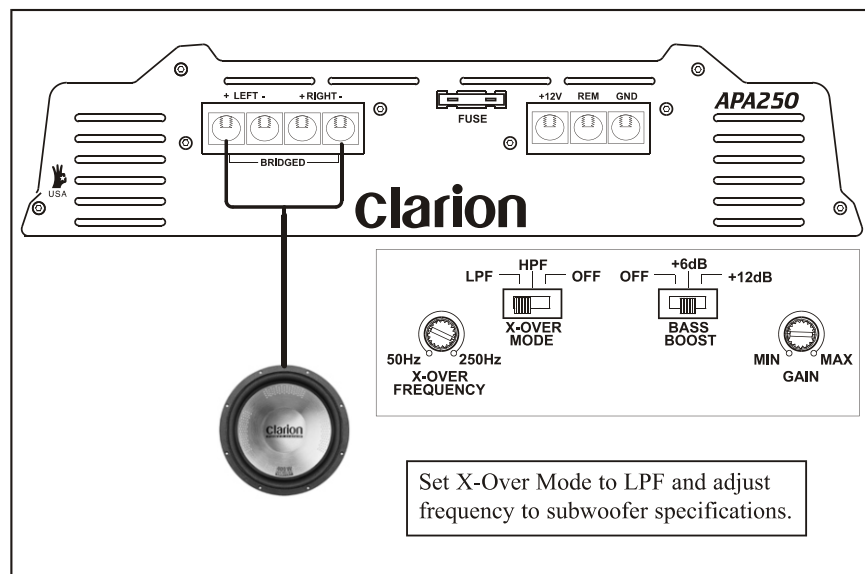


Figure 3 - In this application, the amplifier is bridged for mono operation to drive a subwoofer.

2-Channel Full-Range, Satellite, or Subwoofer System

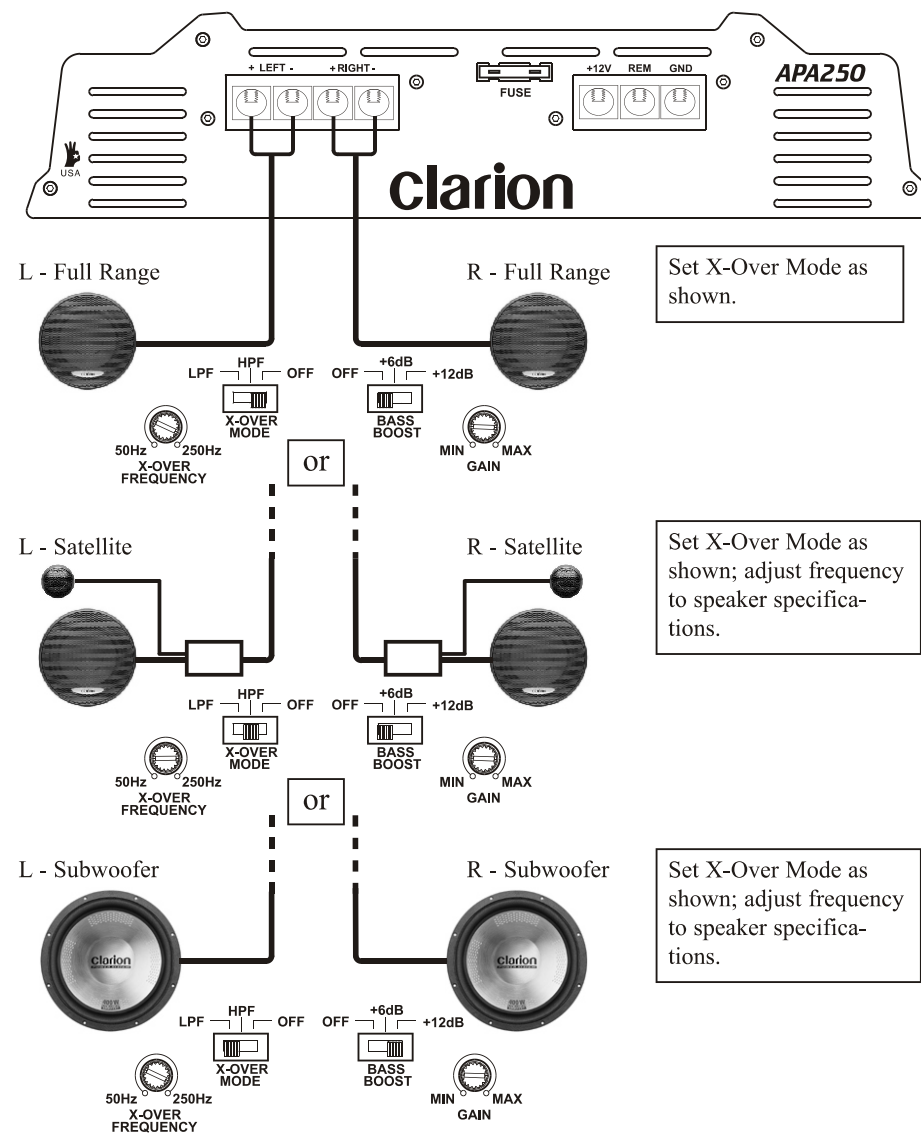


Figure 4 - In this application, the amplifier is used in stereo and drives two full-range (or satellite, or subwoofer) speakers.

NOTE: A passive crossover must be used with satellite speakers.

4-Channel Stereo System

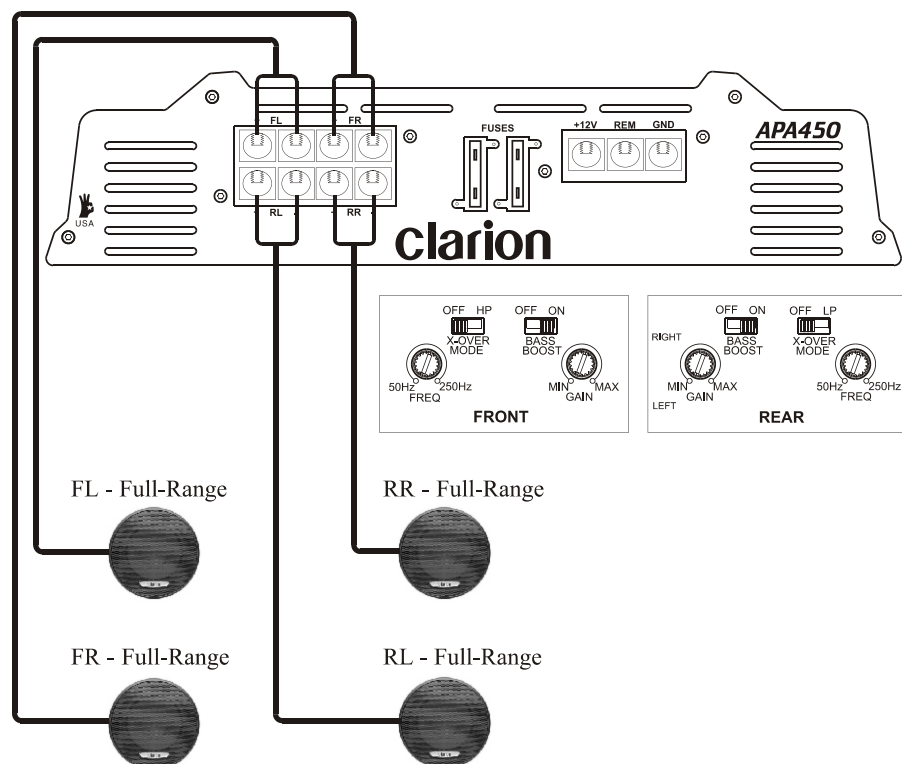


Figure 5 - In this application, the APA450 is used as a 4-channel amplifier to drive four full-range speakers in stereo.

2-Channel High Power System

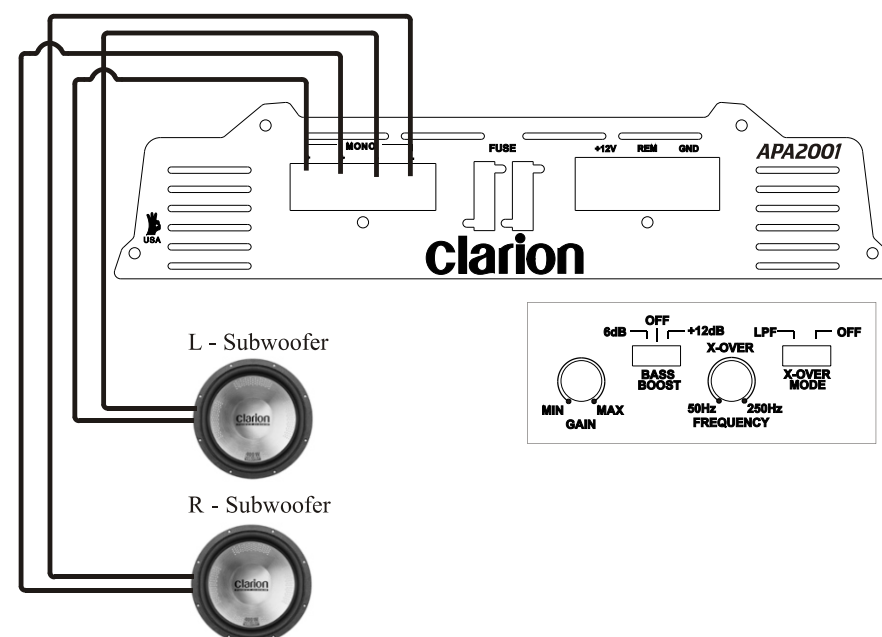


Figure 6 - In this application, the APA2001 is used to drive a pair of subwoofers.

SETTING THE GAIN

After completing the installation, follow these steps to set the Gain Control and then perform the Final System Checks.

1. Turn the Gain Control all the way counter-clockwise.
2. Turn the vehicle's Ignition Switch to the ON position. Then turn the ON/OFF Switch on the source unit to the ON position. Set all Tone or Equalization Controls to "flat" positions and turn Loudness off.
3. Play a CD or Tape and set the Volume Control at 75% of full level.
NOTE: If the system uses an equalizer set all frequency controls to the "flat" position.
4. Slowly increase the Gain Control. Stop when you hear a slight distortion of audio.

SETTING THE CROSSOVER

The Clarion amplifiers feature fully adjustable crossovers. To set the crossovers, follow these steps:

1. Using the X-Over Mode Switch, select the desired mode: LP for Low Pass, HP for High Pass or OFF for Full Range.
2. Using the Freq (Hz) Selection Control, select the desired frequency.

SETTING THE BASS BOOST

1. Initially set the Bass Boost control to its OFF position.
2. Listen to a variety of music styles (e.g., Rock, Rap, etc.) and switch the Bass Boost control ON until a noticeable increase in low bass response is realized.

CAUTION: If you hear a "pop" (due to speaker over-excursion) adjust switch to lower the Bass Boost to prevent speaker damage.

FINAL SYSTEM CHECKS

1. Start the engine and turn on the source unit. After a two-second delay, slowly increase the volume control and listen to the audio. If you hear any noise, static, distortion or no sound at all, check the connections, and also refer to troubleshooting section below. Depending on your system design, the levels may become quite loud even at low volume control settings. Until you get an "audio feel" of the system's power, use care when adjusting controls.
2. Turn the balance controls to their extreme positions and listen to the results. Audio output should match control settings (audio from the left speaker when balance is left).
3. Increase the volume and verify that the amplifier reproduces audio (at full frequencies) without distortion. If you hear distortion, check the connections and verify that the gain control is set correctly. Another possibility is damaged speakers or under-powered speakers. Once again refer to troubleshooting section for additional help.

TROUBLESHOOTING

Problem

No Audio.

Solution

Low or no remote turn-on voltage: Check remote connections at amplifier and source unit.

Blown amplifier fuse: Replace with new fast-blow fuse (same rating).

Power wires not connected: Check battery and ground wiring at amplifier; also check battery connections.

Speaker leads shorted: Check speaker continuity to ground, it should not show a common ground.

Speakers not connected or are blown: Check speaker connections at amplifier, measure coil impedance.

Problem

Audio cycles on and off.

Solution

Thermal protection circuits are shutting amplifier off: Check location for adequate ventilation; consult an authorized Clarion Audio Dealer.

Problem

Distorted audio.

Solution

Gain is not set properly, or damaged speaker cones: Review Setting Gain; inspect each speaker cone for signs of damage (i.e., frozen cone, burning smell, etc.)

Problem

Amplifier fuse keeps blowing.

Solution

Incorrect wiring or short circuit: Review Installation and check all wiring connections.

Problem

Whining or ticking noise in the audio with engine on.

Solution

Amplifier is picking up alternator noise or radiated noise: Turn down input gain and move audio cables away from power wires. Check power and ground connections on amplifier and install an in-line noise filter on source unit's power wire. Also check the alternator and/or voltage regulator. Test for weak battery or add water to battery.

PRODUCT SPECS

MODEL	APA250	APA450	APA2001
Maximum Power Output	100x2	100x4	400x1
Continuous Power Output	50x2	50x4	200x1
THD (1kHz, 10W,4ohms)	<.025%	<.025%	<.025%
S/N	>100dB	>100dB	>100dB
Floor Noise	<2mV	<2mV	<2mV
Channel Separation	>60dB	>60dB	>60dB
Frequency Response	10Hz-50kHz	10Hz-50kHz	10Hz-50kHz
Line Level Input Sensitivity	200mV-6V	200mV-6V	200mV-6V
Speaker Level Input Sensitivity	400mV to 12V	400mV to 12V	400mV to 12V
Input Impedance	33kOhm	33kOhm	33kOhm
Output Impedance	2Ohm	2Ohm Stereo 4Ohm Bridged	2Ohm

This product is warranted against all defects in material workmanship for a period of one year from the date of original purchase. Clarion ProAudio products, except for speakers, are covered by a two-year warranty when installed by an authorized Clarion dealer. The conditions of this warranty and the extent of responsibility of Clarion Corporation under this warranty are as follows:

1.PROOF OF DATE OF PURCHASE WILL BE REQUIRED FOR WARRANTY SERVICE OF THIS PRODUCT. IN CASE OF 2-YEAR WARRANTY FOR CLARION PROAUDIO PRODUCT, PROOF OF INSTALLATION BY AUTHORIZED DEALER IS REQUIRED. INFORMATION ABOUT CLARION AUTHORIZED WARRANTY SERVICE CENTERS MAY BE OBTAINED BY CONTACTING OR WRITING CLARION CORPORATION AT THE ADDRESS LISTED BELOW.

2.This warranty will become void if service performed by anyone other than an approved Clarion Warranty Service Center results in damage to product.

3.This warranty does not apply to any product which has been subject to misuse, neglect or accident, or which has had the serial number altered, defaced or removed, or which has been connected, installed, adjusted or repaired in a manner that is not in accordance with the instructions furnished by Clarion Corporation.

4.This warranty does not cover car static or other electrical interferences, tape head cleaning or adjustments, or labor costs for the removal or reinstallation of the unit for repair.

5.The sole responsibility of Clarion Corporation under this Warranty shall be limited to the repair or replacement thereof, at the sole discretion of Clarion Corporation.

6. If it becomes necessary to send the product or any defective part to Clarion Corporation or an authorized warranty service station, the product must be shipped in its original carton or equivalent carton, fully insured, with shipping charges prepaid. Clarion Corporation will not assume any responsibility for any loss or damage incurred in shipping.

7. ALL IMPLIED WARRANTIES EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW SHALL HAVE NO GREATER DURATION THAN THE WARRANTY PERIOD SET FORTH ABOVE. UNDER NO CIRCUMSTANCES SHALL CLARION CORPORATION BE LIABLE FOR ANY LOSS OR DAMAGE, DIRECT OR CONSEQUENTIAL, ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT. BECAUSE SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS OR EXCLUSIONS OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

8.THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

9.For instructions on how to obtain warranty service, please call **1-800-GO-CLARION** or visit our Web site at **www.clarion.com** for a listing of Authorized Warranty Service Centers in your area, or contact the Clarion Customer Service Manager at the address listed below:

Clarion Corporation of America
661 W. Redondo Beach Blvd.
Gardena, CA 90247-4201 U.S.A.

Dear Customer,

Congratulations on your purchase of the world's finest brand in the mobile electronic industry. At Clarion we are committed to high-quality music reproduction, and we are confident that you will be pleased with your purchase. Clarion's extensive history in the mobile electronic industry translates into products that are built to the highest of standards. These products provide optimum performance, which we are sure you will enjoy for years to come. Thank you for making Clarion your car audio brand.

For maximum performance Clarion recommends having your amplifier installed by an authorized Clarion dealer. Please read your warranty statement and retain your original sales receipt as proof of purchase.

To learn more about Clarion' complete line of car audio products, please visit us at our Web site

www.clarion.com

WARNING

Exposure to continuous sound levels of 85dB or higher may result in hearing loss. Clarion products are capable of producing high sound pressure levels, but please use your product at reasonable levels. Please observe all local sound ordinances for your safety during the operation of your vehicle.

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DESCRIPTION

Clarion has crafted its car audio amplifier to fit a variety of system configurations. The following is a list of features:

- Full frequency response with low distortion and exceptional signal-to-noise performance.
- Advanced circuitry design features bridgeable outputs for use in a variety of applications.
- Independent electronic crossovers, each with a 12dB per octave slope and full adjustment range (from 50Hz to 250Hz), to aid in audio system design.
- Bass boost circuit to reinforce low frequency signals that may be lost due to subwoofer box design.
- Adjustable input level controls with ground loop isolation, accepting a wide range of input signals.
- Remote turn-on with "soft start" muting to prevent turn-on "thump".
- Protection circuits for overheating and speaker shorts.
- 2-ohm load capable to drive a variety of speaker systems.
- Gold-plated input/output connectors and an external automotive- type fuse.
- Aluminum heat sink for efficient heat dissipation.
- Low profile, compact size to accommodate space limitation.

INSTALLATION

This section lists mounting and wiring precautions prior to installing the Clarion amplifier. These safeguards provide enough detail to complete an installation successfully. Do not attempt to install the amplifier yourself, if you do not have the necessary skills. Instead, see your authorized Clarion dealer for installation recommendations.

MOUNTING PRECAUTIONS

Although the Clarion amplifiers incorporate heat sinks and protection circuits, mounting the amplifier in a tight space without any air movement will result in damage to the amp's internal circuitry over time. Choose a site that provides adequate ventilation around the amplifier. For easy system setup, mount the amplifier so the front-panel controls are accessible after installation.

In addition, observe the following precautions:

1. For the most efficient cooling, mount the amplifier so cool air runs along the length of the fins rather than across them. Remember, any moving air will dissipate heat.
2. Mount the amplifier on a rigid surface. Avoid mounting to subwoofer enclosures or areas prone to vibration. Do not install the amplifier on plastic or other combustible materials.
3. Prior to drilling, make sure proposed mounting holes will not cut into the fuel tank, fuel lines, brake lines (under chassis), or electrical wiring.

WIRING PRECAUTIONS

Read all wiring precautions. If you are not sure of the connections, contact your authorized Clarion dealer.

1. Before installation, make sure the source unit's Power switch is in the OFF position.
2. Disconnect the negative (-) lead of the battery before making any power connections.
3. When making connections, be sure that each connection is clean and secure. Insulate final connections with electrical tape or shrink tubing. Failure to do so may result in damage to your equipment.
4. A secure, clean ground connection is critical to the performance of your Clarion amplifier. Use the shortest ground wire possible and securely connect to the vehicle's chassis to minimize resistance and avoid noise problems. Be sure to clean off any paint prior to making this connection.
5. Add an external fuse on the amplifier's positive (+) power lead and connect it as close as possible to the vehicle's (+) battery terminal. Use a fuse rated to the total current consumption of the amplifier(s). Adding an external fuse will protect the electrical system from short circuits that can result in a fire.

INPUT CONNECTIONS AND AUDIO CONTROL

Clarion amplifiers contain connections for RCA Inputs and Audio Control as shown below.

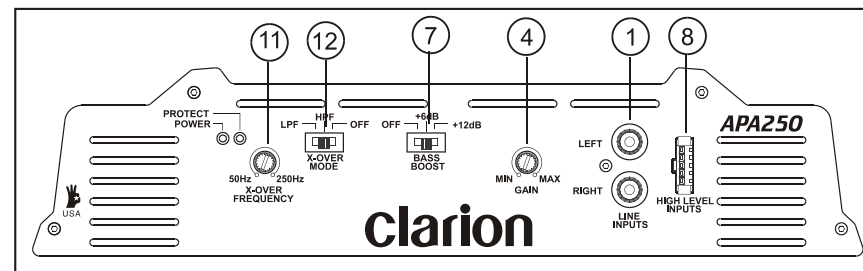


Figure 1-1 APA250 Input Connections and Audio Control

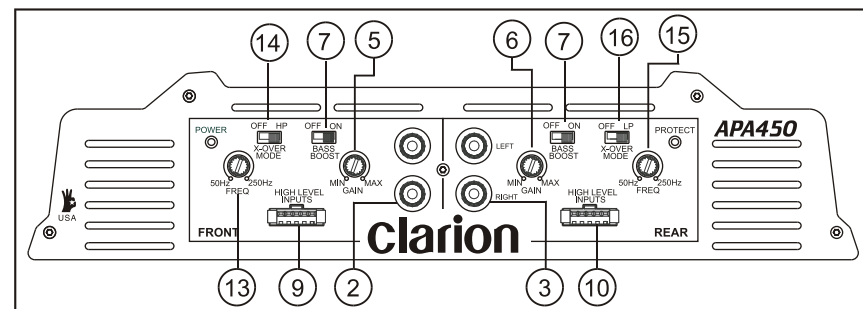


Figure 1-2 APA450 Input Connections and Audio Control

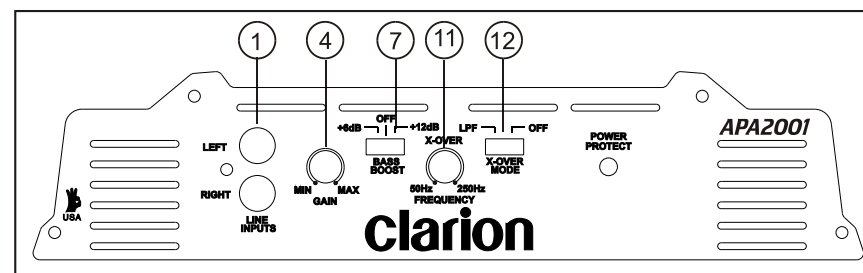


Figure 1-3 APA2001 Input Connections and Audio Control

- | | |
|--------------------------|-------------------------------|
| 1. RCA Input Jacks | 9. Front Speaker Level Inputs |
| 2. Front RCA Input Jacks | 10. Rear Speaker Level Inputs |
| 3. Rear RCA Input Jacks | 11. Frequency Control |
| 4. Gain Control | 12. X-Over Mode Switch |
| 5. Front Gain Control | 13. Front Frequency Control |
| 6. Rear Gain Control | 14. Front X-Over Mode Switch |
| 7. Bass Boost Control | 15. Rear Frequency Control |
| 8. Speaker Level Inputs | 16. Rear X-Over Mode Switch |

The Input Connections are gold-plated RCA Jacks. The Gain Controls provide a wide adjustment range to accommodate output levels from any source unit brand.

• **Gain Controls** - Gain Controls allow you to set the nominal operating level of the amplifier. The amplifier's range, 250mV to 2.5V for RCA inputs or 500mV to 5V for speaker level inputs, can accommodate input levels from virtually any source unit brand.

• **Bass Boost Control** - The amplifier also features a "high-Q" (i.e., narrow frequency band) Bass Boost circuit. It acts much like an equalizer with a switchable gain fixed at 45Hz. Use this feature to tune low-frequency audio response to compensate for a less than ideal subwoofer enclosure design. The added boost produces rich, full bass tones that are normally difficult to reproduce in the car audio environment. NOTE: If Bass Boost is undesired, set Bass Boost to OFF.

High-Pass/Low-Pass Filter Controls

• **Freq (Hz) Controls** - The crossover frequency is fully adjustable between 50Hz and 250Hz. Use this feature, along with your speaker manufacturer's recommended crossover frequencies, to quickly design a more advanced system. NOTE: If either of the X-Over Mode Switches is set to OFF, varying the Freq (Hz) Control will produce no effect.

• **X-Over Mode Switches** - These switches are equipped with 12dB per octave electronic filters for precise frequency attenuation with minimal phase distortion. Each filter is activated by sliding the X-Over Mode Switch to either HP or LP (APA250 and APA2001 only).

• **Speaker Level Inputs** - These provide connections for a high-level stereo source. These connections are provided for installations when the source unit does not have RCA outputs.

WARNING:

When using the speaker (high-level) inputs, the Black wire must be grounded at the radio. Failure to do so will result in noise and/or improper operation.

CONNECTIONS FOR POWER AND SPEAKERS

The rear panel Clarion's amplifiers contain power and speaker connections as shown below.

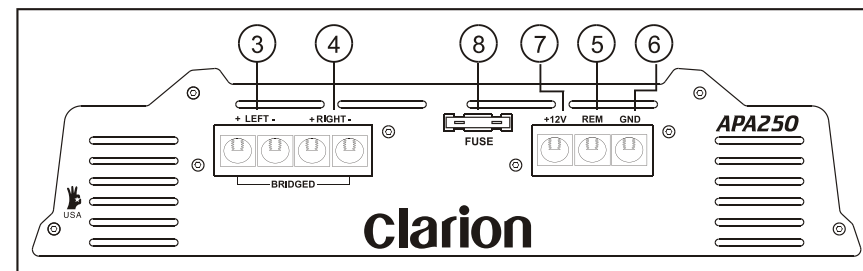


Figure 2-1 APA250 Connections for Power and Speakers

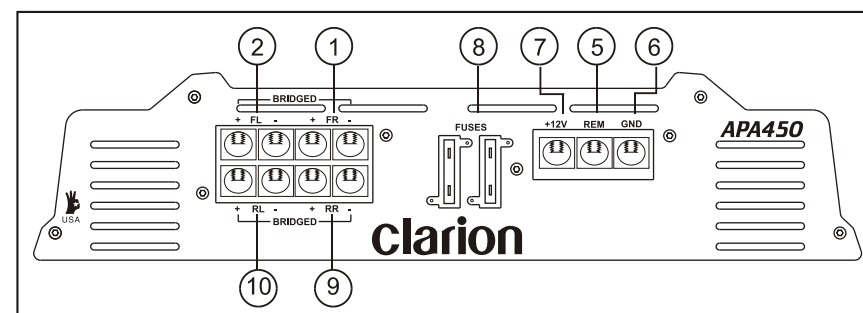


Figure 2-2 APA450 Connections for Power and Speakers

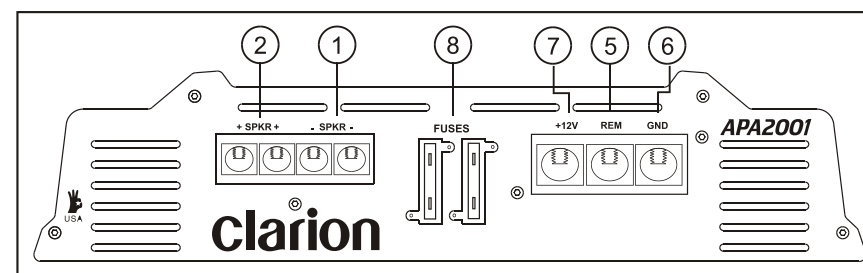


Figure 2-3 APA2001 Connections for Power and Speakers

- | | |
|-------------------------------|-------------------------------|
| 1. Left Front Speaker Output | 6. Ground Input |
| 2. Right Front Speaker Output | 7. Battery + 12V Input |
| 3. Left Speaker Output | 8. Fuse |
| 4. Right Speaker Output | 9. Left Rear Speaker Output |
| 5. Remote Turn-On Input | 10. Right Rear Speaker Output |