2 YEAR Warranty

1 year warranty extension is available when the unit is purchased, installed and registered by an Audiopipe authorized dealer

Audiopipe®

Watts

APDLI-2504

2100W

With Remote Bass Knob

4 Channel Mosfet Power Amplifier

Owner's Manual

CEA Consumer Electronics Association

IASCA INTERNATIONAL AUTO SOUND CHALLENGE ASSOCIATION

SEMA SPECIALTY EQUIPMENT MARKET ASSOCIATION Serving the Motor Vehicle Aftermarket MEMBER

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MECA

For the benefit of all our customers, our new dealer-exclusive amplifier line will carry a 1-year extended manufacturer's warranty (giving you a total of 2 years from the date of purchase). This will be validated by the dealer logging into http://www.audiopipe.com/ and creating an account and registering the product. In addition, the product will need to be purchased and installed by the dealer in order for this extended warranty to be valid. We feel that this added incentive will prove to be beneficial to both dealers and consumers alike.

Audiopipe®

INTRODUCTION

The Audiopipe APDLI-2504 is a full-featured four-channel amplifier incorporating the following features:

- Specially coated circuit boards, that resist mold, mildew and moisture damage.
- Pulse-Width Modulated (PWM) MOSFET power supply for maximum performance with minimal distortion.
- Remote turn-on with “soft start” muting to prevent turn-on “thump”.
- Advanced circuitry design featuring bridgeable and mixed mode operation for use in various system configurations including 4, 3, or 2 channel systems.
- Variable high-pass/low-pass electronic crossover with a 12dB per octave slope (adjustable range: 55Hz to 5.5kHz).
- Variable bass boost circuit to reinforce low frequency signals that may be lost due to subwoofer enclosure design.
- Adjustable input level controls with ground loop isolation to minimize noise and distortion.
- 2 Ohm stereo stable, 4 Ohm mono stable.
- Platinum-plated power, speaker, and RCA connectors.
- Speaker level input.
- Low profile construction with aluminum heat sink for efficient heat dissipation.

ABOUT THE MANUAL

This manual describes the basic requirements to install the Audiopie APDLI-2504 amplifier. The installation of this amplifier can be quite complex to install, if you do not possess the necessary knowledge and tools to perform this installation, please contact your local Audiopipe dealer.

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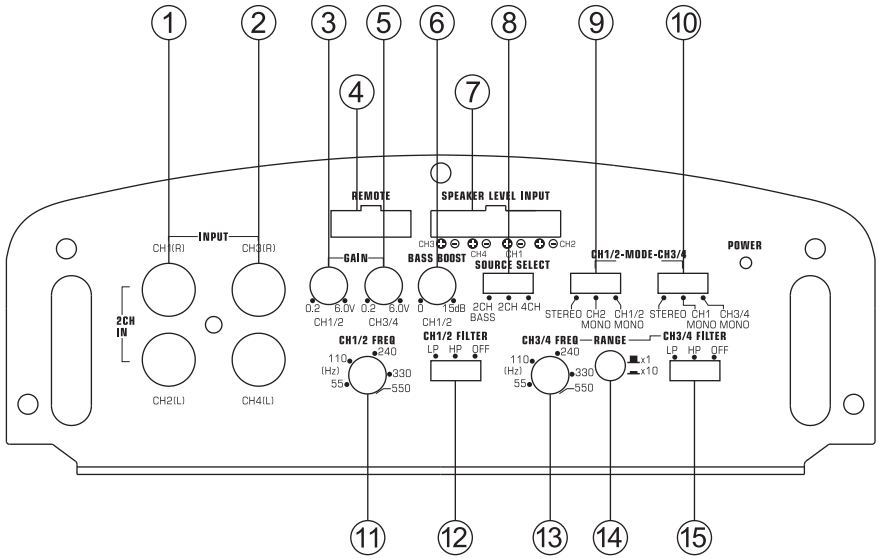
DESCRIPTION

The APDLI-2504 uses an unregulated MOSFET power supply for superior sound and output wattage. In addition, a torpid-coil is used to transfer power with minimal performance loss due to heat. To avoid unwanted noise, a double-sided conformal printed circuit board with strategically placed components keeps AM RFI subdued.
All of the connections and controls for the APDLI-2504 are conveniently located at the ends of the amplifier and labeled appropriately. To ensure the best possible electrical connections, the power, speaker, and RCA inputs are platinum-plated. An additional benefit of this amplifier is the ability to create a 2, 3, or 4 channel amplified system with a flip of a switch (see Application section). In the event of component failure or a short circuit, the APDLI-2504 incorporates safe guards and an outboard ATC fuse to prevent damage to the amplifier.

INPUT CONNECTIONS AND AUDIO CONTROLS

The front panel of the APDLI-2504 contains both connections for RCA and speaker level inputs, along with the audio controls as shown below.

Figure 1



1. CH1 / CH2 RCA Level Input
2. CH3 / CH4 RCA Level Input
3. CH1 / CH2 Gain Control
4. Remote
5. CH3 / CH4 Gain Control
6. CH1 / CH2 Bass Extender
7. Speaker Level Input
8. Source Select
9. CH1 / CH2 Mode Switch
10. CH3 / CH4 Mode Switch
11. CH1 / CH2 Frequency Control
12. CH1 / CH2 Crossover Mode Switch
13. CH3 / CH4 Frequency Control
14. Frequency Range Multiplier
15. CH3 / CH4 Crossover Mode Switch

The Input Connections are platinum-plated RCA Jacks and are labeled as FRONT RIGHT, FRONT LEFT, REAR RIGHT and REAR LEFT. The Gain Controls provide a wide adjustment range to accommodate output levels from any brand of source unit.

Gain Controls

Separate Front and Rear 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 brand of source unit.

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 adjustable gain (from 0 to ~18dB) 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 0dB.

High-pass/Low-pass Filter Controls

Frequency (Hz) Controls

The front crossover frequency is fully adjustable between 55Hz and 550Hz. The rear crossover frequency is fully adjustable between 55Hz and 5500Hz (via the Rear Crossover Frequency Multiplier) for a wider range of crossover points. Use this feature, along with your speaker manufacturer's recommended crossover frequencies, to quickly design a more advanced system (see Applications on page 6). NOTE: If either of the X-Over Mode Switches is set to OFF, varying the Freq (Hz) Control will produce no effect.

Rear X-Over Frequency Multiplier Switch

When engaged, this switch increases the crossover frequency of the rear channels by a factor of 10. Example: If the Freq (Hz) dial is set for 240Hz, pushing in the Multiplier Switch changes the setting to 2400Hz.

X-Over Mode Switches

These switches are equipped with 12dB per octave electronic filters for precise frequency attenuation with minimal phase distortion. The steep crossover slopes keep midrange tones out of the sub-woofer and thereby eliminating an unnatural "nasal" tone quality in the audio system. Each filter is activated by sliding the X-Over Mode Switch to either LP or HP.

Input Mode Switches

These switches allow you to set the input mode for front and rear channels. Stereo input allows full left and right stereo operation. Right (bridged) input allows a single channel input for bridged operation. This is especially useful in high powered systems when using the APDLI-2504 as a bridged 2-channel amplifier. L ~ R (sum mono) allows a stereo input to be summed into a mono output.

Rear Channel Input Select

This switch allows you to use a 2 channel input to drive all 4 channels of this amplifier.

Speaker Level Inputs

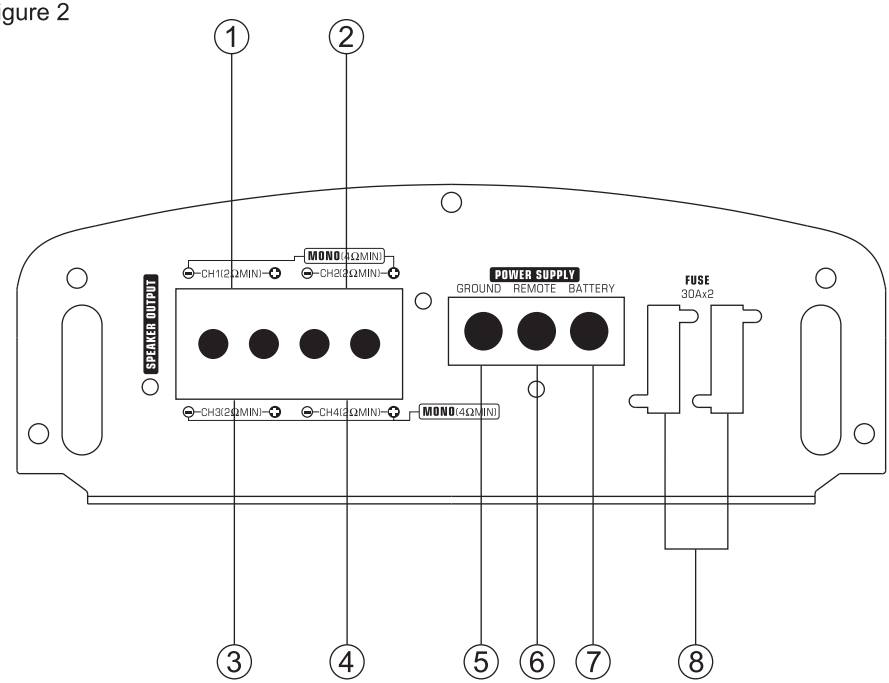
These provide connections for a high-level stereo source. In addition, these connections are provided for installations when the source unit's RCA outputs are unavailable.

WARNING: When using the speaker (high-level) inputs, the Black wire must be grounded at the Radio. Failure to do this will result in noise and improper operation.

CONNECTIONS FOR POWER AND SPEAKERS

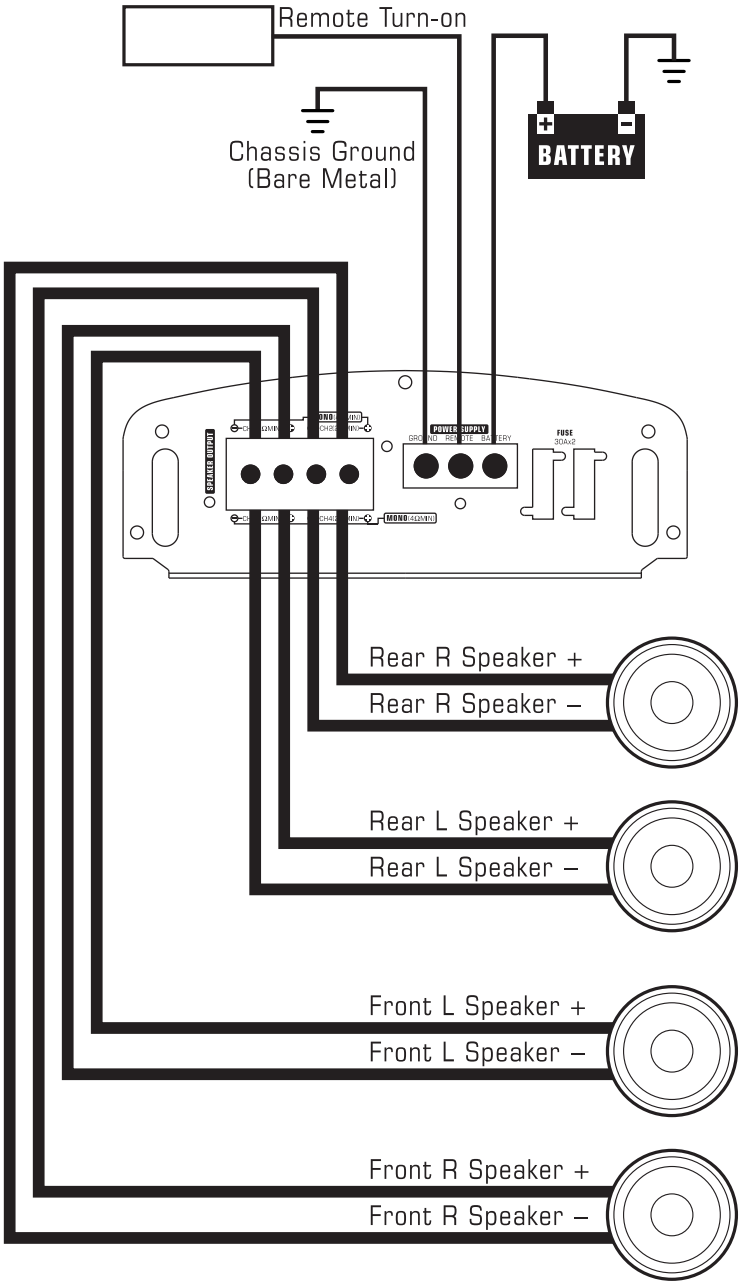
The rear panel of the APDLI-2504 contains power and speaker connections as shown below.

Figure 2



1. CH1 Front Speaker Output
2. CH2 Front Speaker Output
3. CH3 Rear Speaker Output
4. CH4 Rear Speaker Output
5. Ground Input
6. Remote Turn-on Input
7. Battery +12v Input
8. (2)30Amp Fuses

Figure 3
Connections for power and speakers



INSTALLATION

This section suggests Mounting and Wiring Precautions for installing the Audiopipe APDLI-2504 amplifier. If you do not posses the necessary tools and installation experience, do not attempt to install this amplifier. Instead, contact your local Audiopipe dealer to perform the installation.

MOUNTING PRECAUTIONS

Prior to mounting the amplifier, make sure it is safe to mount the amplifier in that location. Failure to do so can result in serious damage to the boat. In addition, stainless steel hardware should be used to mount the amplifier and additional accessories. When possible, use a nut and bolt with a lock washer to secure the amplifier. Extra care and attention is necessary in marine installations due to the uncertainty of water conditions.
Additional precautions and suggestions:

1. For the most efficient cooling, mount the amplifier so cool air runs along the length of the heat sink, rather than across them. To increase air movement and circulation, a cooling fan can be installed.
2. Mount the amplifier on a rigid surface; avoid mounting to subwoofer enclosures or areas prone to vibration.
3. Prior to drilling and holes, make sure the proposed mounting holes will not cut into the fuel tank, fuel lines, electrical wiring, or through the boat.
4. Do not mount the amplifier where it is susceptible to water.

WIRING PRECAUTIONS

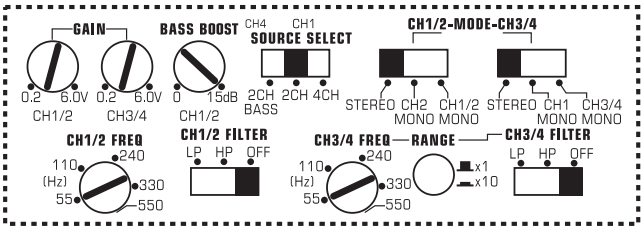
Read all of the wiring precautions prior to making any connections. If you are unsure and/or don't have the necessary installation hardware, contact your local Audiopipe dealer to perform the installation.

1. Before you begin the installation, make sure the source unit Power switch is in the OFF position.
2. Disconnect the negative (–) lead of the battery (or batteries) 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 damage your equipment.
4. A good ground is critical for the performance of the amplifier. A ground wire should be run directly from the battery to the amplifier. Use black insulated 10-gauge or larger wire for the amplifier's ground (–) power lead.
5. Add an additional fuse holder and fuse at the positive (+) terminal of the battery. The fuse rating should equal the total current consumption at full output of the amplifier(s). Use red insulated 10-gauge or larger wire for the amplifier's positive (+) power lead. Do not install the fuse until the complete installation has been performed.
6. When replacing the amplifier's fuse, always use one having the same amperage rating. Substituting a higher rated fuse or a slow-blow type can result in serious damage to the amplifier.
7. When creating passage holes for power cables, RCA's cords, and speaker wires, use grommets to eliminate any sharp edges created during drilling. This will protect the wire from being nicked and causing a short circuit.
8. Extra cable can cause signal loss and act as an "antenna" for noise. Use only high-quality RCA cords that are no longer than necessary.
9. In multiple amplifier systems, it is recommended to use a relay on the remote turn-on lead of the radio.

WIRING AND APPLICATIONS

The Audiopipe APDLI-2504 4-channel amplifier can be used in a variety of system applications. Here are some examples to help plan your own installation.

4-Channel Full-Range Stereo System



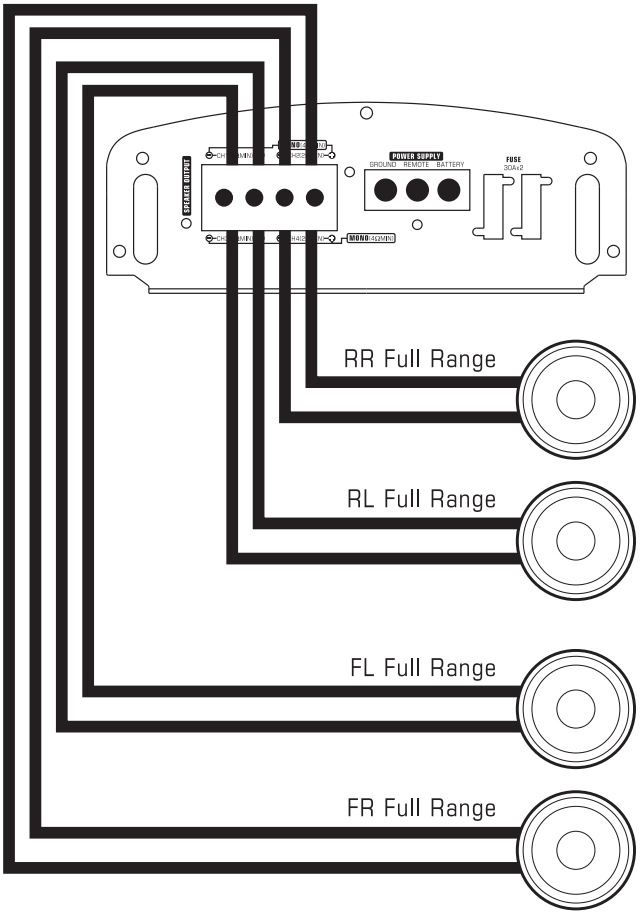


Figure 4
In this application, the APDLI-2504 is used as a 4-channel amplifier to drive four full-range speakers in stereo.

4-Channel Stereo System
2-Channel High-Pass, 2-Channel Low-Pass

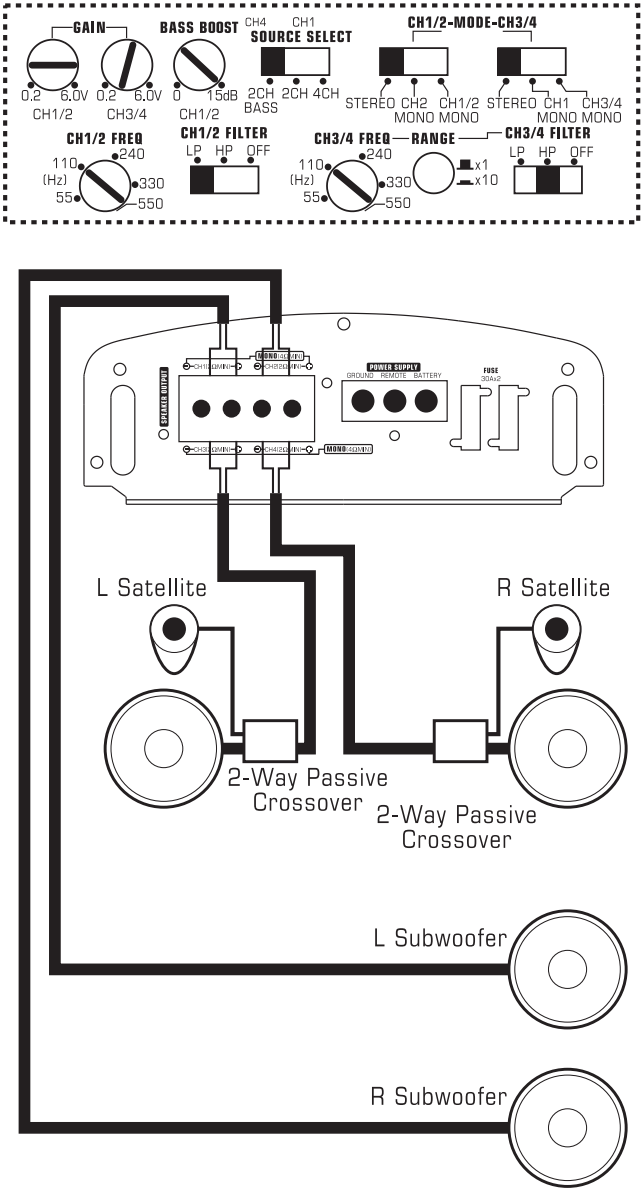


Figure 5
In this 4-channel system, the APDLI-2504 drives a pair of stereo satellites for the front and a pair of subwoofers for the rear. Note the filter settings.

2-Channel Stereo System with Low-Pass Bridged Mono Channel

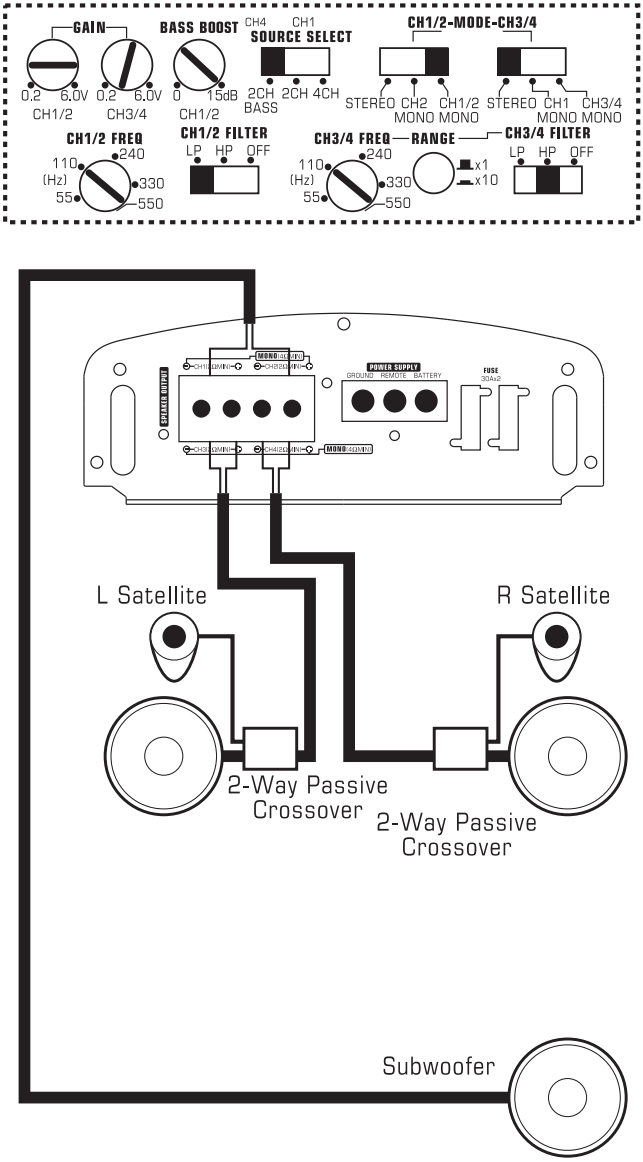


Figure 6
The APDLI-2504 can also be used to drive a pair of stereo satellites for the front and a single mono subwoofer for the rear. Note the filter settings.

2-Channel High Power System
(Satellite or Subwoofer)

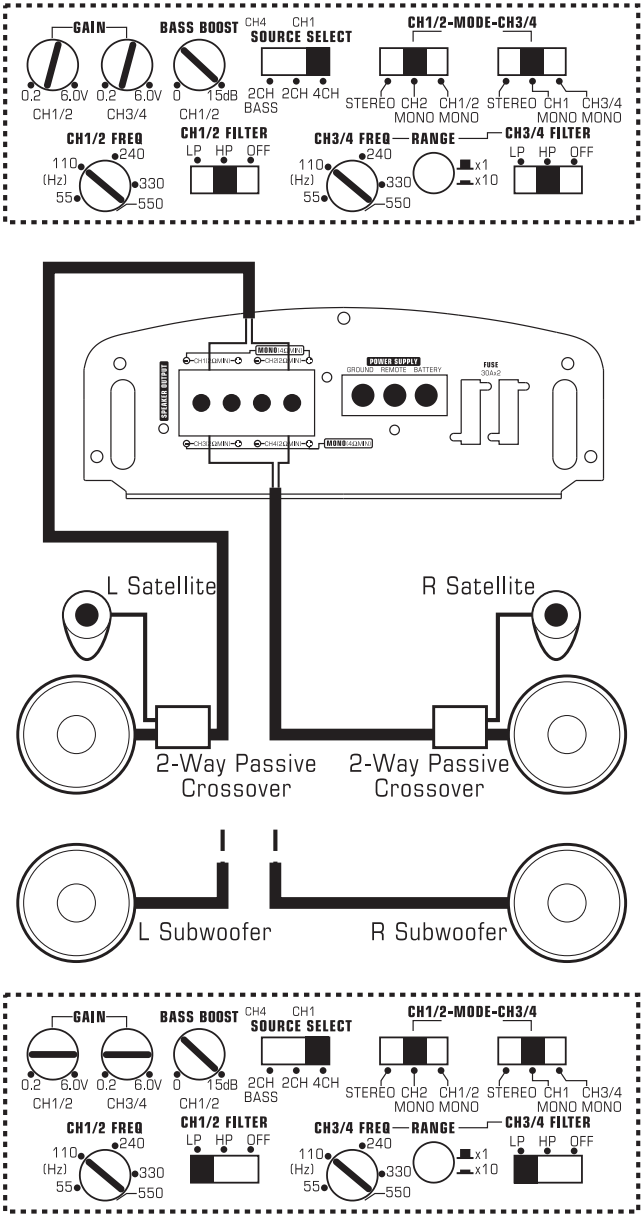
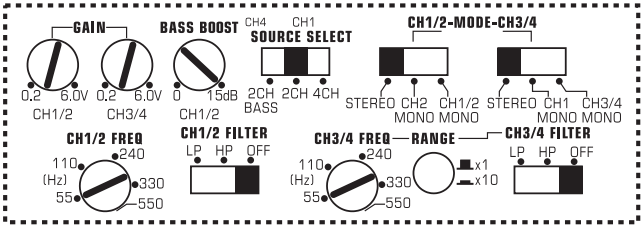
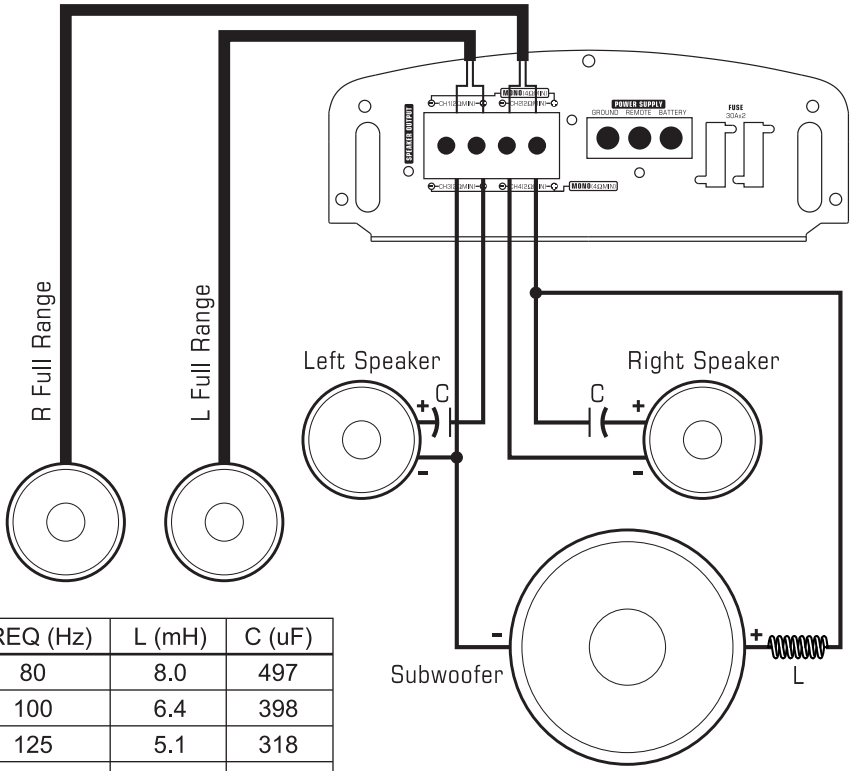


Figure 7
The APDLI-2504 can be set up as a 2-channel high-power amplifier to drive a pair of satellites (or subwoofers).

Mixed-Mode System On Rear;
Full-Range Speakers On Front





FREQ (Hz)	L (mH)	C (uF)
80	8.0	497
100	6.4	398
125	5.1	318
150	4.2	265
200	3.2	199

NOTE: Chart values based on 4 Ohm speakers.

Figure 8

The amplifier can be configured for a mixed-mode operation on either channels 1/2 or 3/4 amplifier sections. The table provides component values to create a 6dB per octave crossover at specified frequencies. Use components that have a +5% tolerance and capacitors rated at 100V.

NOTE: Choose the same frequency for both LP and HP crossovers. Do not overlap frequencies, as this may damage the amplifier.

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 units 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 its frequency controls to "flat" positions.
4. Slowly increase the Gain Control. Stop when you hear a slight distortion of audio.

SETTING THE CROSSOVER

The Audiopipe APDLI-2504 features fully adjustable front and rear 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
2. Pass or OFF for Full Range.
   Using the Freq (Hz) Selection Control, select the desired frequency. If the desired frequency exceeds the range of the Freq (Hz) Selection Control, press the Crossover Frequency Multiplier Switch to increase the value by a multiplier of 10.
   • For example, 55Hz x 10 = 550Hz or 550Hz x 10 = 5.5kHz.
3. Repeat steps 1 and 2 for both the front and rear crossovers.

SETTING THE BASS BOOST

1. Initially set the Bass Boost control to its full left position (i.e. 0dB).
2. Listen to a variety of music styles (e.g. Rock, Rap, etc.) and slowly increase the Bass Boost control until a noticeable increase in low bass response is perceived.
3. Slowly adjust the Bass Boost control (up or down) to realize the best bass response.

CAUTION: If you hear a "pop" (due to speaker over-excursion), lower the Bass Boost to prevent speaker damage. If the system sounds muddy and distorted (due to amplifier clipping), lower Bass Boost to avoid shutdown from overheating.

FINAL SYSTEM CHECK

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. 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 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 Audiopipe 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; move audio cables away from power wires. Check power and ground connections on amplifier; install an in-line noise filter on source unit's power wire; check alternator and/or voltage regulator; test for weak battery or add water to battery.*

PRODUCT SPECIFICATIONS

Frequency Response	20Hz ~ 20kHz
Signal Noise Ratio	>95dB
THD	.05% all channels driven
Input Sensitivity Low Level	250mV ~ 2.5V
Input Sensitivity Speaker Level	500mV ~ 5V
Maximum Power Output	2100W
Continuous Power Output	Stereo 4 Ch-110W x 4 @ 4 Ohm
	Stereo 4 Ch-160W x 4 @ 2 Ohm
	Bridge 1 Ch-250W x 2 @ 4 Ohm
Dimensions	(H)55 x (W)176 x (L)384 mm