

P2110
amplifier / crossover
instruction manual

analog and digital systems
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keep listening, safely!

Sustained listening to loud music over 100dB has been shown to cause permanent hearing damage. Systems using a/d/s/ components are capable of achieving volume levels which substantially exceed this level. When operating your system for sustained periods at high volume, be sure to use hearing protection to prevent long-term exposure. We want you to be able to enjoy the music for many years to come.

features of your PowerPlate^(tm)

Transient Perfect MOSFET Power Supply - The heart of the P-series, this supply frees the PowerPlate from the constraints of common pwm (pulse width modulated) supplies. The advantages are; extremely fast overload recovery time, low output impedance for superior damping, and stability during voltage fluctuations for reliable performance in the harsh automotive environment. The P2110 uses two individual power supplies, one for each channel.

Remote Subwoofer Control Capability - Can be used with accessory control AC502 to provide a dashboard mounted subwoofer or rear channel level control.

Detachable Plug in Connectors - High-current speaker and power connectors simplify installation and help to keep wiring neat and organized.

Multi-cross Variable Built-In Crossovers - 12 dB per Octave High-pass, Low-pass and Band-pass functions are built-in, virtually eliminating the need for external crossover networks in even the most elaborate systems, in mono mode low-pass filters can be cascaded for 24dB per Octave filtering.

PowerPlate Design - a/d/s/ original low profile, high efficiency heatsink design keeps size minimum and allows mounting where space is limited.

Wide input sensitivity range - Allows connection to virtually any source unit from Factory OEM radios, to low output preamps.

Simultaneous Stereo + Mono - Each channel pair may be used Stereo, Mono, Bridged or both Stereo + Mono simultaneously. This allows an additional Mono speaker to be used with a stereo pair for center-channel or subwoofer applications.

Same Side Adjustments - The P-series PowerPlate makes system adjustment easy by organizing all signal processing controls on one side of the amplifier. This layout allows convenient system adjustment and facilitates a variety of installation possibilities when access to the controls is desired.

Internal Summing Network - allows all four channels (front and rear, left & right) from the head unit to be fed to the P2110 for constant subwoofer output.

Throughput RCA Connectors - provides a convenient connection point for additional amplifiers in the system.

warnings and tips

Always disconnect the battery ground wire before doing any work on your vehicle. Reconnect the cable only after the installation is complete and the wiring has been checked to make sure that there are no problems. If your radio features a code type security system be sure you know the code before disconnecting the battery!

Your a/d/s/ PowerPlate^(tm) should be installed in 12V negative ground vehicles only. Connection to other types of electrical systems may cause damage to the vehicle or the amplifier. Wear Eye and Ear protection when using power tools.

Before cutting or drilling carefully inspect the area carefully to make sure there is no electrical wiring, fuel lines or brake lines which could be damaged. Sometimes these components are hidden between double-walled panels, so be very careful.

Do not bypass or modify the fuses, or replace with one of a higher rating. The fuse should not fail under normal operation. Repeated fuse blowing indicates a problem with the amplifier or improper installation.

introduction

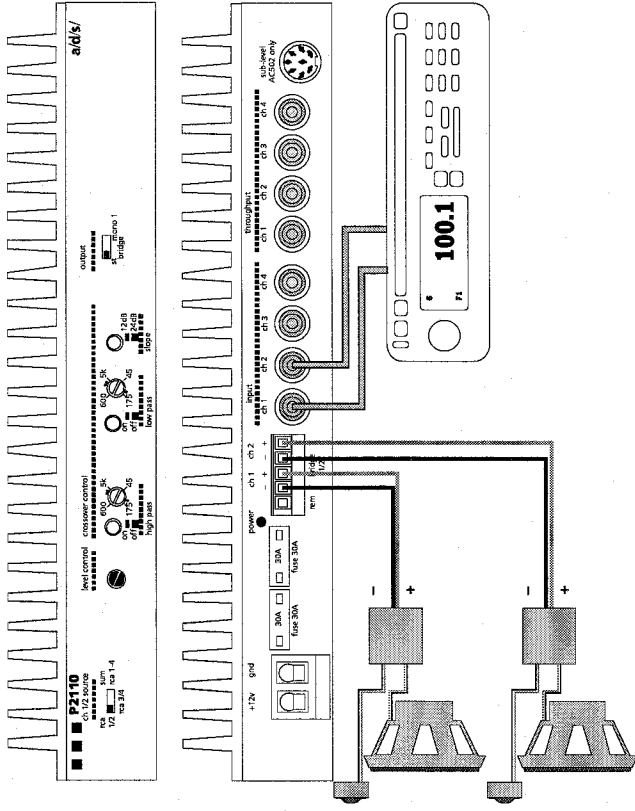
Thanks for choosing this a/d/s/ PowerPlate^(tm) amplifier. Your new PowerPlate is the latest in a line of innovative car audio firsts which began back in 1974 when a/d/s/ introduced the first car system to use a switch-mode power supply; the technology which makes today's high power car amplifiers possible. Your new PowerPlate incorporates technology which is as advanced today as that early a/d/s/ 2001 system was in 1974. From the flexible built-in crossover to the Transient Perfect^(tm) power supply and sophisticated circuit design by renowned audiophile engineer Ed Meitner, each part of your new a/d/s/ PowerPlate was specifically selected to deliver the most from all types of music. Whether asked to deliver the power of the most outrageous Synth-Bass or the subtle nuance of an acoustic guitar, the technology of your a/d/s/ PowerPlate is focused towards one goal - to deliver the sound as it should be.

about this manual

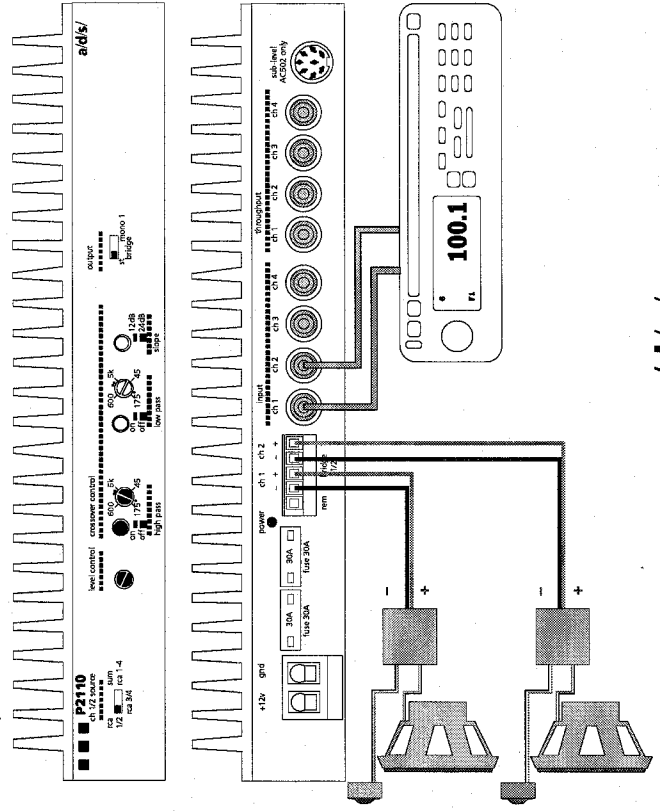
To get the most from your a/d/s/ PowerPlate, we recommend that you have the installation performed by your qualified authorized a/d/s/ dealer. If this unit is installed by your dealer, we will extend the warranty to three-years instead of the standard one-year. However, if you feel that you have the necessary skills and prefer to perform the installation yourself, this manual will guide you through the process of installation and set-up. Please read through it completely before beginning the installation so that you may familiarize yourself with the total procedure before you begin. If there is anything that you do not fully understand, please consult with your a/d/s/ dealer before attempting the installation.

- button is disengaged
- button is engaged

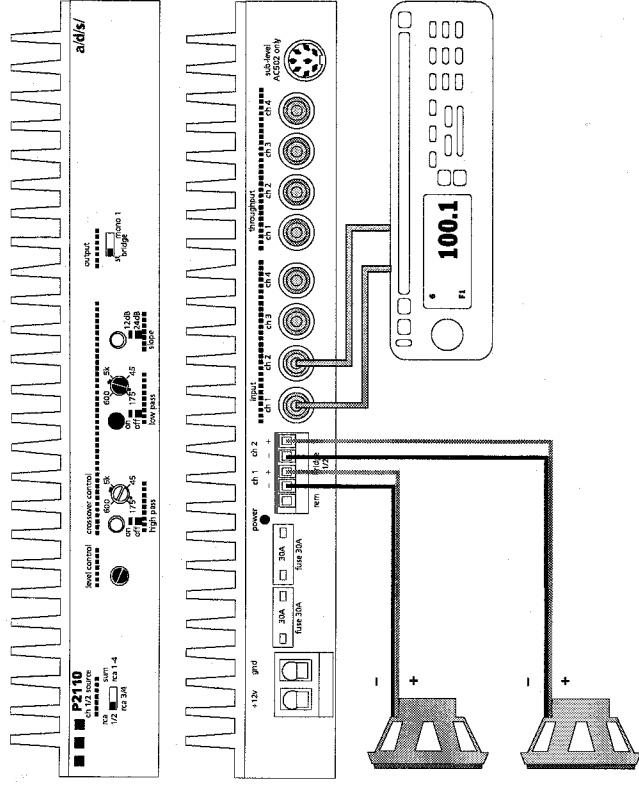
System 1- The P2110 used in 2 channel mode with channels 1 and 2 used for full range speakers.



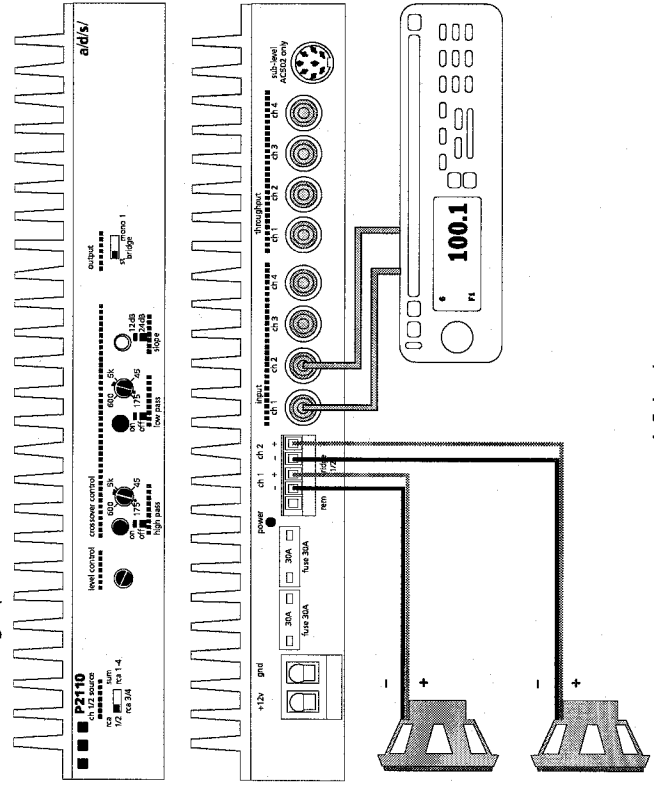
System 2- The P2110 used in 2 channel mode with channels 1 and 2 configured high-pass for satellite speakers or tweeters.



System 3- The P2110 used in 2 channel mode with channels 1 and 2 configured low-pass for subwoofers or midrange speakers in a simplified speaker system.

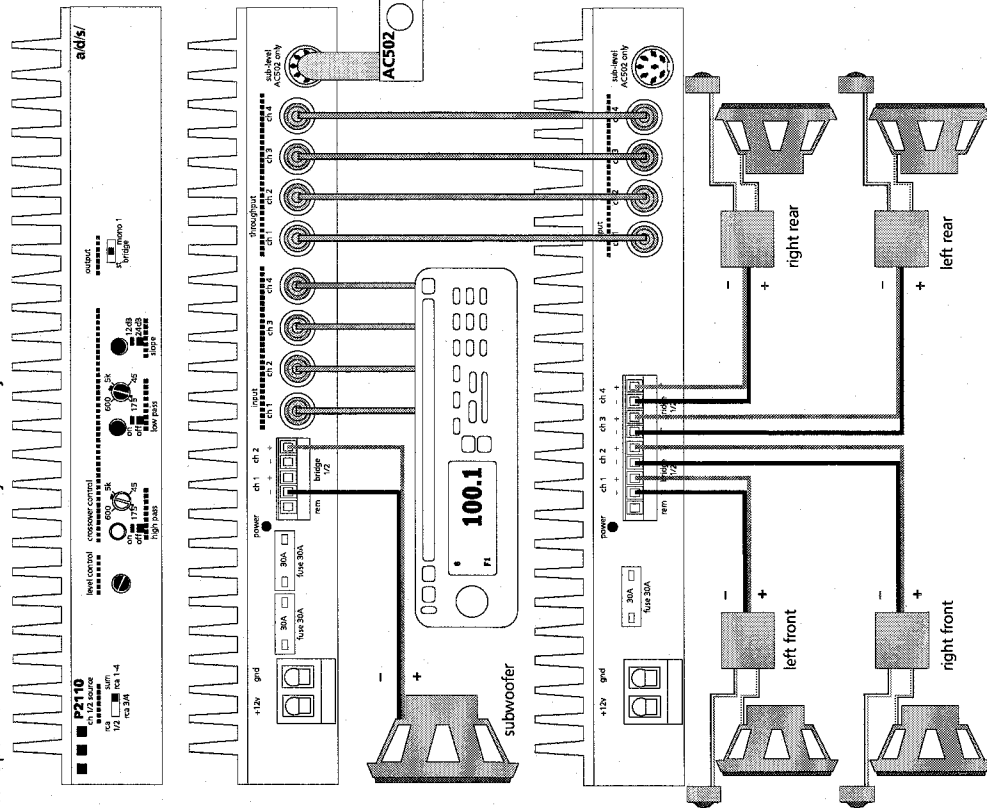


System 4- The P2110 used in 2 channel mode with channels 1 and 2 configured band-pass for midbass or midrange speakers.



System 5 - The P2110 used in 1 channel mode with signal derived from the sum of RCA channels 1 through 4 configured low-pass for bridged output subwoofers. Channels 1 through 4 throughputs feed signal to satellite amplifier.

Note: Optional AC502 is used in this system to adjust the level of the subwoofers.



mounting locations

Due to its low profile and small size there are many possible choices of mounting locations. Always mount the PowerPlate™ in a place that protects it from the elements. In addition mount the PowerPlate on a stable flat mounting surface. Whenever possible, pre-drill the mounting holes. Remember to check behind the panel for hidden dangers in the form of hoses, fuel or brake lines or electrical wiring. Use a marking pen or awl to mark the hole locations and pre-drill using a 1/8" bit.

Run all the wires to the mounting location in advance of the final mounting. Note - avoid running signal wires bundled together with power cables, this can lead to engine noise induced on to the signal cables.

Passenger compartment mounting All PowerPlates have been designed with a low profile to make under seat mounting possible. Regardless of where you choose to mount your PowerPlate be sure keep a minimum of 1" of clearance around the amplifier for adequate airflow to prevent overheating.

Trunk compartment mounting The most common mounting location is in the trunk or cargo compartment. For optimum cooling, mount the PowerPlate chassis vertically with the fins running vertically, or mount the PowerPlate horizontally with the fins pointing upward. Avoid horizontal mounting locations with the fins pointing downwards. Also, locate the PowerPlate where it, and connections to it, will not be damaged by cargo or tools which may shift during vehicle operation.

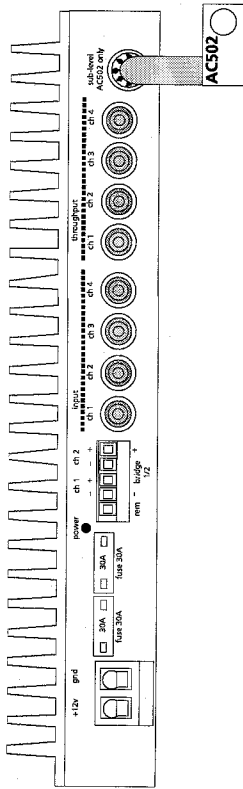
Engine compartment mounting Don't even think about it! The PowerPlate was not designed to endure the harsh chemical and heat environment of the engine compartment. Failure to obey this warning will void your warranty.

installation

1. Disconnect the battery ground wire. Reconnect the cable only after the installation is complete and the wiring has been checked to make sure that there are no problems. If your radio features a code type security system be sure you know the code before disconnecting the battery!
2. Run a minimum AWG #8 power wire directly from the battery to the PowerPlate mounting location. Install a fuseholder at the battery end of this cable either within 18" of the battery or before the wire runs through any metal partitions. Do not install the fuse at this time.
3. Attach a minimum AWG #8 ground wire to a solid chassis ground point near the mounting location. Keep this wire as short as possible. Scrape all paint and primer off of the sheet metal at the ground point to ensure a good electrical connection. Attach the wire to the ground point with a nut, bolt and star washer. Cover the scraped area with a rust inhibiting spray.
4. Run the signal leads and remote turn-on leads from the head unit to the PowerPlate location. If using an internally powered radio or factory radio refer to the "signal sources" section for the proper wiring connections.
5. Install the speakers and run each of the speaker leads to the PowerPlate location. Connect the speaker, remote, and power wires to the appropriate terminals on the plug-in terminal blocks. Refer to the "controls and connections" or "system planning" sections for information on the proper connections. The terminal blocks install with the set screws facing down.
6. Preset the crossover and channel mode switches, and crossover frequency switches to the desired positions. Refer to the "controls and connections" section for more information.
7. Adjust all amplifier input level controls to the 1/4 position.
8. Mount the amplifier into position and plug in the power and speaker terminals. Attach the input signal cables. It is also a good idea to spray undercoating on any screws that protrude through the bottom of the vehicle to prevent rusting.
9. Reattach the battery ground wire.
10. Double check your switch and control settings. Install at least a 60A fuse in the fuseholder you have installed near the battery.
11. Turn on the signal source at a low volume level. Using the balance and fader controls, check to see that each channel is connected to the proper speakers. Make sure that the proper frequency range is being sent to each speaker if you are using the crossover features built in to your PowerPlate.
12. Adjust the input sensitivity and crossover frequencies as described in the "tuning" section.
13. Read the rest of this manual to get maximum use and enjoyment from your system.

Using the AC502 (optional)

The AC502 remote level control, available as an accessory from your a/d/s/ dealer, may be used with your PowerPlate™ to remotely adjust the volume of the low-pass crossover. This provides the useful ability of adjusting the subwoofer level easily from the listening area. To use this feature, simply connect the AC502 into the DIN connector on the P2110, and install the AC502 in the desired location. Refer to the Adjustments section for information on setting up the AC502 for the appropriate adjustment range.



multi-cross™ crossover configuration

cover control. The crossover selection for channels 1 & 2 has five possibilities.

When the low-pass switch and the high-pass switch are in the out position, the crossover section of the amplifier is by-passed. Channels 1 & 2 output is full range.

When the high-pass switch is depressed, channels 1 & 2 are filtered through a 12 dB/Octave high-pass crossover that is infinitely variable from 45 Hz to 5,000 Hz.

When the low-pass switch is depressed, channels 1&2 are filtered through a stereo 12 dB/Octave low-pass crossover that is infinitely variable from 45 Hz to 5,000 Hz.

When the both switches are depressed, channels 1 & 2 are filtered through a 12 dB/Octave band-pass filter.

Note: When using both sections to create a bandpass filter, make sure you have selected a low-pass frequency that is higher than the high-pass frequency!

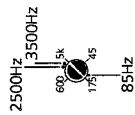
When the low-pass switch and the slope switch are depressed, ch 1 & 2 are filtered through a mono 24dB/Octave low-pass filter

Note: When using the 24dB/Octave slope position the output will be mono!

tuning

tuning the crossover All of the crossover controls in the multi-cross™ crossover section are marked at four reference frequency points. These are 45 Hz, 175 Hz, 600 Hz and 5,000 Hz. Specific crossover points should be chosen based on the operating range recommended by the manufacturer of your speakers. In addition there are three small dots on the frequency range dial representing commonly used a/d/s/ crossover frequency recommendations. These are 85Hz, 2,500Hz and 3,500Hz respectively.

The 85Hz position is a good starting point to use for subwoofer low-pass or midrange high-pass use. When bi-amping a/d/s/ loudspeaker components 2500Hz. is a good starting point for the midrange low-pass, and 3500Hz. is recommended as the tweeter high-pass. Once installed, you can fine-tune the crossover points using your ears or with the aid of an RTA to achieve maximum performance. With any loudspeaker, minor deviations from the recommended frequency ranges may provide superior results, depending on your speaker locations and your vehicle's acoustics. Setting crossover frequencies higher than recommended will not cause damage and may provide good results. However, DO NOT set high pass tweeter crossovers below the tweeters recommended operating range. Doing so will likely cause damage not covered by the manufacturers warranty. If you are using non-a/d/s/ speakers, refer to the manufacturers recommendation for selecting the proper crossover frequencies.



adjusting input sensitivity The input sensitivity setting is important to ensure proper performance, low noise levels, and maximum system reliability. As a general rule, components at the "front end" of the system should be set as high as possible with the input sensitivity of the amplifier set as low as possible while still providing adequate volume levels. Using a high signal level from the source, and a low input sensitivity setting on the amplifier will keep the background noise levels of the system low. The following procedure will help you get the widest dynamic range from your system.

1. Start with the input level controls of your PowerPlate™ at 1/4 rotation or less (Counterclockwise) position.
2. Set the tone controls and any controls on any equalizers or other signal processors to their flat or bypassed positions.
3. Set the input and output level controls, if any, on any associated equipment such as equalizers or onboard electronic crossovers as recommended by their manufacturers.
4. Select a well recorded CD or Tape containing material recorded at a fairly high level. Musical content is not important except that the music chosen should be recorded such that any system distortion can be clearly heard, not masked by musical content.
5. Increase the source unit volume control about halfway. Increase the PowerPlate level control associated with the front full-range (or midrange in a bi-amplified front system) until you can hear sound at a low but clear level.
6. While listening carefully for any signs of distortion, slowly increase the source unit volume control until you either hear the first signs of distortion or you can't turn it up any more. Back down on the volume control slightly until the distortion goes away. You have just found the maximum undistorted output level of your source unit. Do not exceed this level in normal operation, doing so will just send a distorted signal to the rest of the system.
7. Returning to the PowerPlate level control associated with the front main speakers, slowly increase it until you reach the point where distortion just begins to appear. This will be at the point where either the amplifier reaches it's maximum output level, or the speakers reach their output limits. Either way, you have just calibrated the system so that the maximum system output occurs at the same point as the maximum output from the source. This will give you minimum system noise yet the system will reach it's maximum output capability.
8. Reduce the source unit volume to a comfortable listening level. With the balance and fader controls still centered, adjust the remaining level controls for the proper system balance. If you are adjusting a system with multiple speakers and amplifiers, it is easiest to adjust the controls in the following order: 1. Front speakers 2. Rear speakers 3. Subwoofers

9. If using an AC502 remote level control, adjust the subwoofer level with the AC502 in the mid position. This will give you the ability to boost the subwoofer level approximately 6dB when the AC502 is turned fully clockwise.

10. Double-check your system levels by increasing the source unit volume control to the previously determined maximum position. If you hear distortion from any of the channels, reduce the PowerPlate input level control for those channels until the distortion goes away.

Adjusting the input levels this way will get maximum undistorted output from your system, and will make it unlikely that you will cause damage to any of the components of your system by overdriving them.

troubleshooting

symptom no output	probable cause source or amplifier not turned on	remedy check source or amplifier and fix as needed
	audio input not connected or no output from source protection circuit activated	check RCA connections and signal integrity, fix or replace as needed turn down volume. Protection will self reset
	speaker wires not connected	check speaker wires and fix or replace as needed
audio cycles on and off	speaker damaged thermal protection engaged Loose or poor audio input	check system with known working speaker and fix or replace as needed check that amplifier has adequate ventilation check speaker impedance load check RCA, power and speaker connections and fix or replace as needed
distorted output	preamp volume set too high, exceeding maximum capability of amplifier. Impedance load to amplifier too low shorted speaker wires speaker not connected properly	check volume of preamp and adjust appropriately check speaker impedance load, if below 1 ohm rewire the speakers to achieve a higher impedance check speaker wire connections and fix or replace as needed check speaker wiring and fix or replace as needed. refer to the speaker wiring section of this manual for detailed instructions
poor bass response	speaker damaged	check system with known working speaker and fix or replace as needed check speaker polarity and fix as needed
lack of stereo separation	speakers wired with wrong polarity causing cancellation at low frequencies speakers wired with wrong polarity stereo / bridge switch set to bridge position speaker connected across wrong output terminals source set to mono	set switch to stereo position check that the speaker wires are not connected to the bridged terminals and fix as needed check source and adjust controls as needed

If you want to consult the factory, write or call our customer service department:

Customer Service Department
Analog and Digital Systems, Inc
One Progress Way
Wilmington, MA 01887
PH 508-658-5100
FAX 508-658-8498

specifications

amplifier section

power output 4 Ω (watts)¹
2 channel 2 x 110
1 channel 1 x 370

power output 2 Ω (watts)²
2 x 185

distortion all channels driven 0.1%
20Hz to 20,000Hz

frequency response \pm 1dB
10Hz to 30,000Hz

signal to noise ratio full
bandwidth @ rated output power
>90dB

damping factor @ output
connector full bandwidth
>150

input sensitivity
150mV to 10Vrms for full output

input impedance
47 k Ω

fuse type
30 ATC x 2

crossover section³
ch 1 & 2
high-pass & low-pass
continuously variable 45Hz to 5KHz

general
dimensions
10 1/2" x 11 3/4" x 2"

1. All channels driven, continuous FTC rated 4 Ω load, 20 Hz to 20,000 Hz, <0.1% THD, power input voltage at 13.8 VDC.
2. All channels driven, continuous FTC rated 2 Ω load, 20 Hz to 20,000 Hz, <0.1% THD, power input voltage at 13.8 VDC.
3. All channels are selectable with infinitely variable adjustments from 45 Hz to 5,000 Hz with a slope rate of 12 dB/Octave and a "Q" of .707

warranty information

There are two things you must do to ensure trouble free service in the event you need warranty repairs.

- 1 - Keep your original sales receipt in a safe place. A copy of the receipt will be required to obtain warranty service.
- 2 - Be sure your retail dealer has written the date, the model number, and the serial number (if applicable) of the Product on the receipt.

To give yourself an extra measure of protection, make a separate record of the information about your purchase and keep it in a safe place. In the event you misplace the sales receipt, your dealer may be able to give you a copy. Take a moment now to read the terms of your warranty. Check to be sure your sales receipt is dated and has the Product model number and serial number (if applicable) on it. Then put it away in a safe place.

When shipping a Product in for service:

- Enclose a copy of your original sales receipt that has the date, the Product model number and serial number (if applicable) written on it.
- Always ship Products in the complete original packing material.
- Avoid shipping Products via the Postal service. If you must use the Postal service, be sure to register and insure the package.

a/d/s/ Limited Warranty

Analog and Digital Systems, Inc. (a/d/s/) warrants to the original consumer purchaser of the a/d/s/ Products described in this manual, that the Product will be free from defects in materials and workmanship for a period of one (1) year after the date of purchase. If the product is installed by an authorized a/d/s/ retail dealer, the warranty is extended to three (3) years, a/d/s/ sole obligation under this warranty shall be to provide, without charge, parts and labor necessary to remedy the defects, if any, that appear during the warranty period.

This warranty is the sole and exclusive express warranty given with respect to the Product. All other express warranties are hereby excluded. Neither a/d/s/ nor the authorized dealer who sells the Product is responsible for indirect, incidental, or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

IMPORTANT - Keep your original sales receipt. Be sure the retail dealer has written on it the date, model number, and serial number (if applicable) of the Product. This information is required for warranty service.

This warranty is limited to:

- Products purchased from authorized a/d/s/ retail dealers in the United States. a/d/s/ will supply a list of authorized dealers on request.

In order to obtain warranty service you must:

- Return the Product, freight prepaid, to the a/d/s/ dealer from which it was purchased, an authorized a/d/s/ independent service agency or to a/d/s/. If necessary you may call a/d/s/ Customer Service Department for the names and addresses of authorized independent service agencies in your area.
- Provide proof of purchase in the form of a copy of your original sales receipt. The date, model number, and serial number (if applicable) of the Product must be written on the sales receipt.

This warranty does not cover:

- Damage that is the result of misuse, abuse, accident (including but not limited to damage by water), faulty hookup, defective or maladjusted associated equipment, or the use of the Product with equipment for which it was not intended.
- Cosmetic defects that appear more than thirty (30) days after the date of purchase. Cosmetic damage caused by improper handling is also excluded.
- Products that are used for commercial purposes.
- The cost of removing or reinstalling the Product.
- Damage that occurs while the Product is being shipped to whoever will service it. See the information above regarding shipping procedures.

This warranty is void if:

- The Product identification or serial number label is removed or defaced in any way.
- The Product is serviced or repaired by any one other than a/d/s/ or an authorized a/d/s/ dealer or service agency.