

# OWNER'S MANUAL

**PrecisionPower™**  
Absolutely State of the Art Mobile Audio™

## AMPLIFIER MODELS

D500/1

D1000/1

D2000/1

D3000/1



## TABLE OF CONTENTS

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Congratulations . . . . .	2
Service . . . . .	2
Caution . . . . .	2
Features . . . . .	3
What's Included . . . . .	3
CEA Specifications . . . . .	3
Specifications . . . . .	4
Amplifier Status LEDs . . . . .	6
Tools/Parts for Installation . . . . .	7
Wiring . . . . .	7
Ground Wiring . . . . .	9
Charging System . . . . .	10
Current Draw . . . . .	10
Power Wire Size . . . . .	11
PowerLock Connectors . . . . .	12
Front Plate Diagrams . . . . .	13
End Plate Diagrams . . . . .	14
Inputs . . . . .	15
Advanced Instrumentation Input . . . . .	15
QBASS PLUS Specifications . . . . .	16
QBASS PLUS/QBASS Remote . . . . .	17
TC-X Crossover . . . . .	18
Crossover Detent Chart . . . . .	19
Adjusting Input Gain . . . . .	20
High Mass Internal Heatsink . . . . .	20
AP-IV Protection Circuit . . . . .	20
Troubleshooting . . . . .	20

## CONGRATULATIONS

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Thank you for choosing *Precision Power™* audio equipment. Designed and engineered in the USA, this product combines innovative technology with the finest materials to consistently deliver *Absolutely State of the Art™* performance, sound quality, reliability, and value. This *Precision Power™* product reflects our commitment to offer you unparalleled performance and quality for years of dependable service and listening enjoyment.

## SERVICE

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Do not attempt to service *Precision Power™* products yourself. Performing maintenance on your audio equipment will void the warranty. Many parts of the *Precision Power™* product are custom built to our specifications. **Our factory parts are not made available to anyone else nor are they for sale.** Our goal is to make sure that your *Precision Power™* product will always sound as good as the day it was purchased. Contact your *Authorized Precision Power™ Dealer* about obtaining any warranty service through *Precision Power™*. (See the Warranty on the outside of the back cover).

## CAUTION

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Extended use of a high powered audio system may result in hearing loss or damage. While *Precision Power™* systems are capable of “Concert Level” volumes with incredible accuracy, they are also designed for you to enjoy at more reasonable levels all of the sonic subtleties created by musicians. Please observe all local sound ordinances.

## FEATURES

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Advanced Instrumentation Input Stage.  
24dB/Octave; HP/LP/FULL; 30-4kHz Crossover.  
Independent Line Output Crossover 30-4kHz  
PWM Power Supply  
Triple Darlington Output Stage.  
**AP-IV** Protection Circuitry  
**QBASS™** Bass Boost  
High Voltage Input Capability with -12dB Attenuation Switch.  
Gold Plated RCA Input and Output Connectors.  
**PowerLock™** Speaker and Power Wire Connectors.

## WHAT'S INCLUDED

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Amplifier (with speaker and power plugs mounted)  
(4) Mounting screws and washers  
2mm hex wrench  
2.5mm hex wrench  
3mm hex wrench

## CEA SPECIFICATIONS

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### D500/1

Power Output: 125 Watts RMS x 1 at 4 ohms and  $\leq 1\%$  THD+N  
Signal to Noise Ratio: -70 dBA (reference 1 Watt into 4 ohms)



Additional Power Output: 270 Watts RMS x 1 at 1 ohm at 14.4 Supply  $\leq 1\%$  THD+N

### D1000/1

Power Output: 185 Watts RMS x 1 at 4 ohms and  $\leq 1\%$  THD+N  
Signal to Noise Ratio: -68 dBA (reference 1 Watt into 4 ohms)



Additional Power Output: 495 Watts RMS x 1 at 1 ohm at 14.4 Supply  $\leq 1\%$  THD+N

### D2000/1

Power Output: 375 Watts RMS x 1 at 4 ohms and  $\leq 1\%$  THD+N  
Signal to Noise Ratio: -71 dBA (reference 1 Watt into 4 ohms)



Additional Power Output: 1150 Watts RMS x 1 at 1 ohm at 14.4 Supply  $\leq 1\%$  THD+N

### D3000/1

Power Output: 495 Watts RMS x 1 at 4 ohms and  $\leq 1\%$  THD+N  
Signal to Noise Ratio: -60 dBA (reference 1 Watt into 4 ohms)



Additional Power Output: 1475 Watts RMS x 1 at 1 ohm at 14.4 Supply  $\leq 1\%$  THD+N

# SPECIFICATIONS

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## Nominal Power Ratings

<u>MODEL</u>	<u>4ohm MONO</u>	<u>2ohm MONO</u>	<u>1ohm MONO</u>
<b>D500/1</b>	1 X 125	1 X 200	1 X 250
<b>D1000/1</b>	1 X 175	1 X 275	1 X 500
<b>D2000/1</b>	1 X 375	1 X 600	1 X 1000
<b>D3000/1</b>	1 X 500	1 X 1000	1 X 1500

## General Specifications

Conversion Efficiency	>80% @4 ohms
Frequency Response	20Hz - 200Hz +0, -1dB
Total Harmonic Distortion	<0.02%
Input Sensitivity	200mv - 5 Volts RMS
Phase Adjust	0° or 180°, selectable switch
RCA Output Jacks	HP/LP/Full; 30Hz to 4kHz
Input Impedance	40 kohms
Supply Voltage	9 - 16 Volts
Damping Factor	>150
Slew Rate	>50V/μs
<i>QBASS PLUS™</i>	Up to +18dB Boost @30, 36, 44, or 60Hz
Crossovers Type/Range	LP—30Hz to 250Hz HP—off/24dB switch 20Hz to 100Hz LP—off/24dB switch 30Hz to 250Hz
Protection Functions	Short, thermal, over voltage (16V) and under voltage (9V)

## Fuse Requirements

You will need to install an in-line fuse or circuit breaker in the power wire within 18" of the battery. This fuse or circuit breaker is to protect your vehicle from fire in case the power wire shorts to the vehicle body. If you are only using one amplifier, use the fuse rating indicated in this chart. If you are using more than one amplifier, add up the fuse ratings for all the amplifiers. This sum is the rating for your fuse or circuit breaker. You may also want to add a power distribution block near your amplifiers to distribute large gauge power cable to multiple amplifiers.

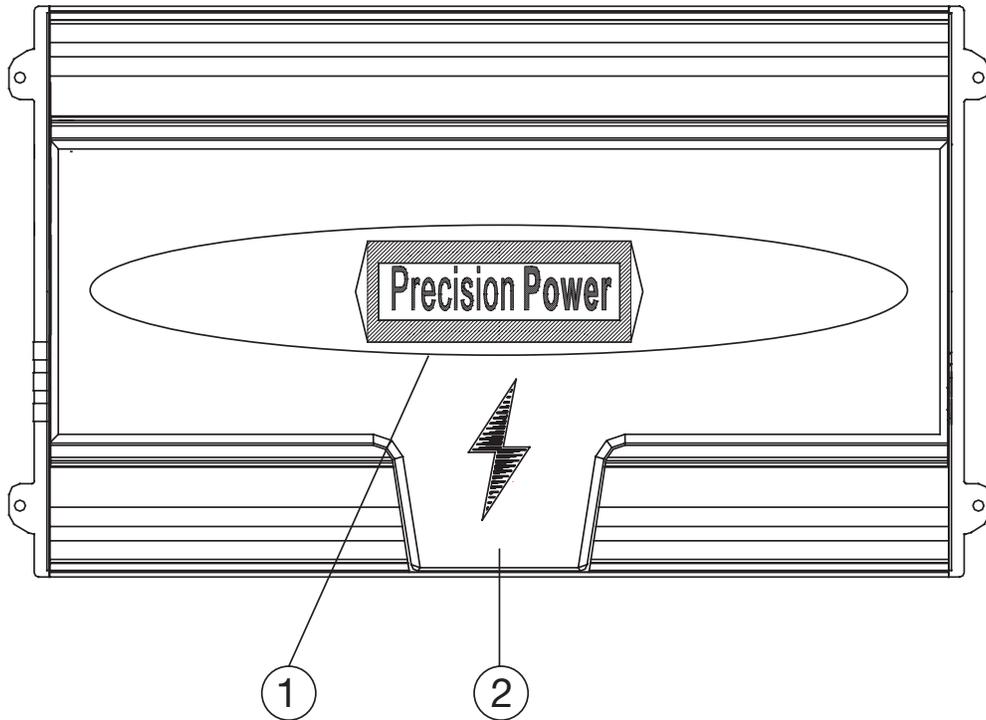
Amp	Fuse
D500/1	40 A
D1000/1	50 A
D2000/1	100 A
D3000/1	150 A

## Dimensions

	Length	Width	Height
<b>D500/1</b>	12- $\frac{1}{2}$ "	10- $\frac{1}{2}$ "	2- $\frac{3}{4}$ "
<b>D1000/1</b>	21- $\frac{1}{2}$ "	10- $\frac{1}{2}$ "	2- $\frac{3}{4}$ "
<b>D2000/1</b>	24- $\frac{3}{4}$ "	10- $\frac{1}{2}$ "	2- $\frac{3}{4}$ "
<b>D3000/1</b>	29- $\frac{3}{8}$ "	10- $\frac{1}{2}$ "	2- $\frac{3}{4}$ "

## AMPLIFIER STATUS LEDS

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The LEDs provide the following indications:

- 1. Power** - These LEDs illuminates the center Precision Power logo background when the amplifier power is turned on.
- 2. Short** - These LEDs behind the PPI logo will flash to indicate a short on the output.
- 2. Thermal** - These LEDs behind the PPI logo will extinguish if the amplifier is in thermal shutdown protection.

**Note:** Read the **AP-IV Protection Circuit** section for additional information regarding **Short and Thermal** protection.

## **TOOLS/PARTS FOR INSTALLATION**

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**NOTE: TOOLS ARE NOT SUPPLIED.**

Small flat blade screwdriver

Phillips screwdriver (#2 or medium sized)

Wire cutters

Wire strippers

4 - #6 round head screws, and 1 - #8 sheet metal screw. (or nut, bolt, flat washer, star washer) (see details)

2 - Ring connectors (large enough to accommodate your method of grounding)

In-line fuse or circuit breaker

Power and ground wire

Speaker wire - 12-16 gauge

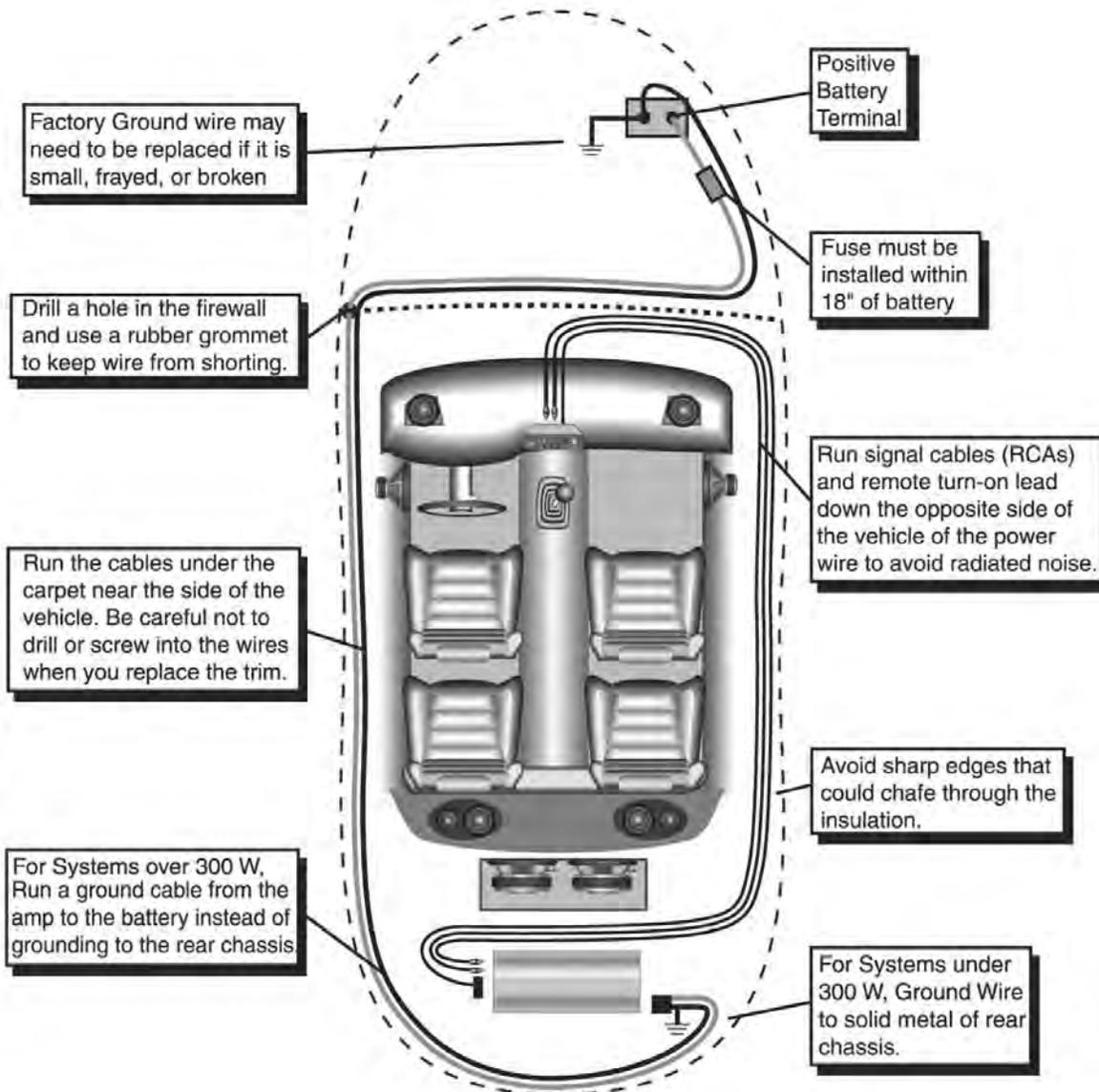
Grommets (sized to work with the power wire you plan to use in your installation)

Tube of silicone sealant

## **WIRING**

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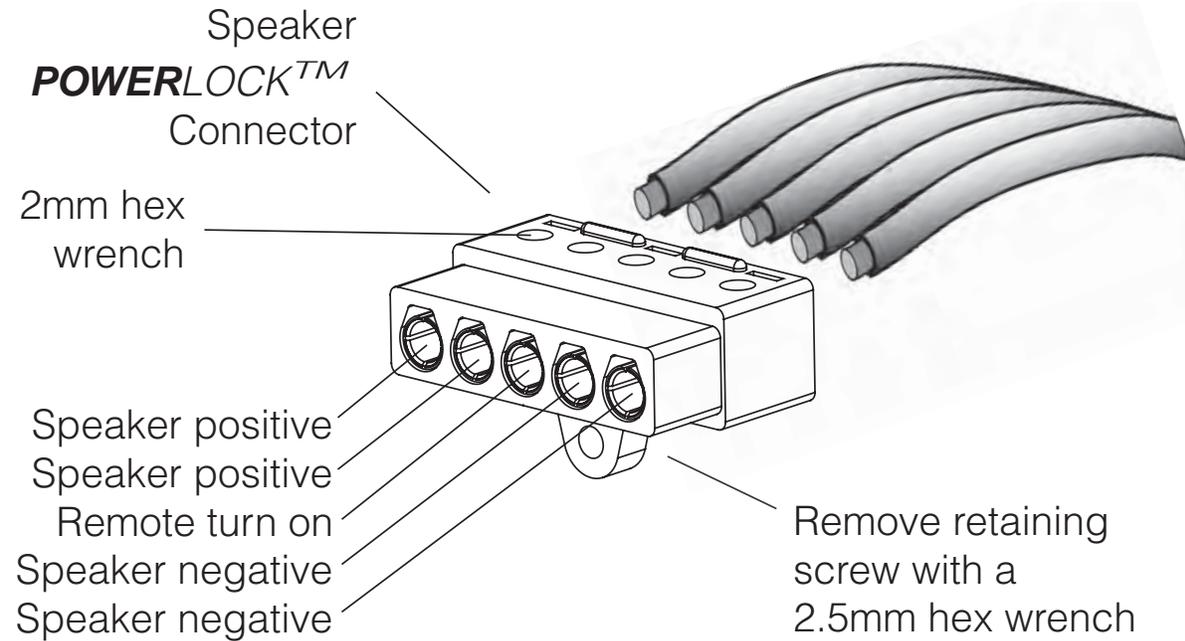
Before beginning, disconnect the negative (-) terminal of the battery prior to connecting the amplifier to the positive (+) 12V terminal to prevent a short to ground and potential damage to wiring and equipment. Some vehicle radios have an anti-theft feature where when the radio is removed from 12V the radio will no longer function and must be code reset.



**Note: The cables running from the battery to the rear of the car should be installed on the side of the car opposite to the antenna.**

When using 16 gauge wire or larger, run the speaker wires from the amplifier location through the vehicle to the speakers. Observe the same precautions for routing these wires that you followed for running the power and remote turn on wires. Cut off excess and, using wire strippers, strip 1/4-inch of insulation. Locate the speaker/remote turn-on **PowerLock™** connector. Using a hex wrench loosen the screws on the upperside of the connector. Insert the speaker leads into the end and secure with the hex wrench. Check to be sure you've maintained proper polarity before securing each wire.

**Note: The amplifier comes with the connector inserted into the amplifier with the wire clamping screws in the up position as shown below. Use a 2mm hex head wrench to secure the wires to the connector. If the connector needs to be unplugged from the amplifier, use a 2.5mm hex head wrench to remove the retaining screw from the connector (set aside and save the retaining screw). The two negative outputs are common to each other as are the two positive outputs. A speaker may be connected to either terminal.**



## **GROUND WIRING**

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Locate an area near the amplifier(s) that is metal and clean an area about the size of a quarter down to bare metal. Inspect the area around and underneath to be sure you will not drill into wires, brake or fuel lines, etc. Drill a pilot hole in the middle of this area. Terminate the ground wire with a ring connector and attach it to the bare metal using a #8 sheet metal screw and washer or preferable, a bolt, nut and a star washer. (not supplied). We suggest crimping and soldering this connection. After the connection is complete, coat the area (on both sides) with silicone or some similar material to prevent rust from developing on the bare metal. If your total current draw is over 80 amps (or total power is over 500 watts). Keep the ground and power



wires as close together as possible, and use the same gauge wire for both. This will ensure that you have a good ground path, and may eliminate such potential problems as engine noise and overheated amplifiers.

## **CHARGING SYSTEM**

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If your total current draw is over 100 amps (*or total output power is over 600 watts*), you are probably exceeding the capability of your charging system. Dimming lights and fluctuating voltage are solid indicators that you need to upgrade your alternator, battery, or both. You should also check the condition and current capacity of the stock battery negative cable and connections, and replace or upgrade as necessary. Keep in mind that your amplifiers simply convert electrical energy to acoustical energy, and any electrical deficiency will compromise the performance of your sound system. For more information about charging system upgrades, see you local authorized *Precision Power™* Dealer or call *Precision Power™* Technical Support at **1-800-62POWER x2033**.

## **CURRENT DRAW**

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The following is a basic formula to be used as a guide to determine current draw. Your new amplifier is more efficient than most other amplifiers. This formula is to be used as a guideline. Using wire of a larger gauge can only improve the current transfer of your system. Do **NOT** use smaller wire gauge.

Total RMS output X 1.3 = Total Input Wattage

$$\frac{\text{Total Input Wattage}}{\text{Supply Voltage}} = \text{Current Draw (in Amps)}$$

**Example:** A *PPI* amplifier has one channel at 1000 watts RMS rating into 4 ohms.

You would use the formula in the following way:

1000 W X 1.3 = 1300 watts

$$\frac{1300W}{12V} = 108 \text{ Amps total current draw}$$

If the same amplifier is driven into a 2 ohm load, double it's 4 ohm RMS rating. These amplifiers will effectively double their power at this load.

$$1000W \times 1.3 \times 2 = 2600 \text{ watts}$$

$$\frac{2600W}{12V} = 217 \text{ Amps total current draw}$$

If you are using more than one amplifier, add up the total current draw for all of them and choose the appropriate gauge based on the grand total.

### **POWER WIRE SIZE**

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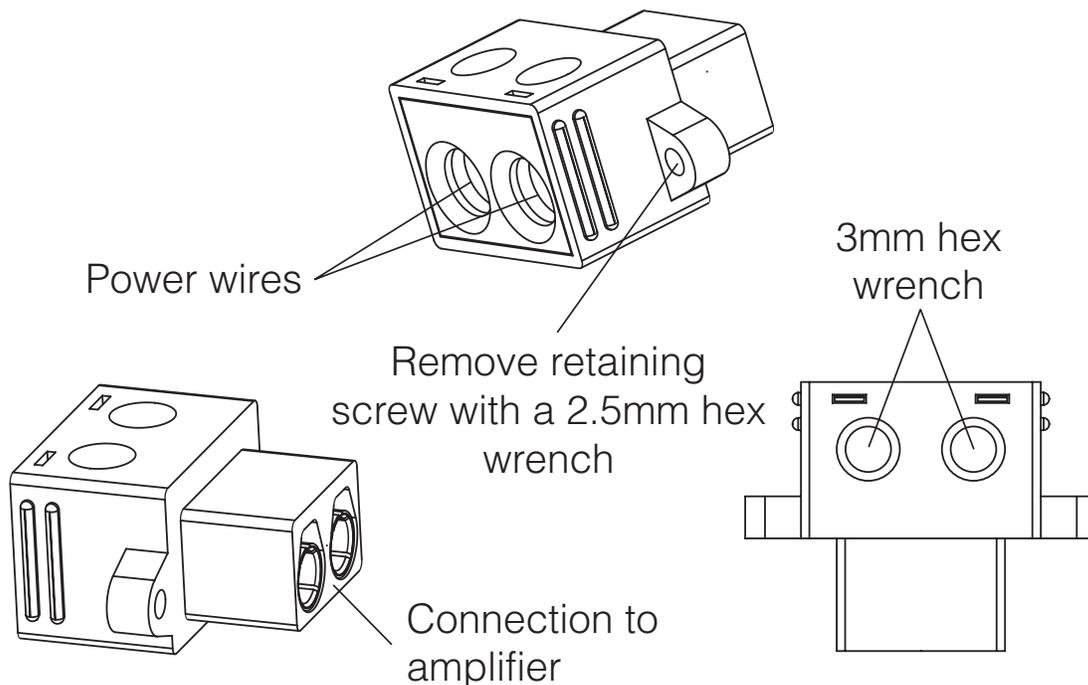
A minimum of 8 gauge or a maximum of 4 gauge wire is recommended dependent on the application.

The ground wire must be the same gauge as the power wire.

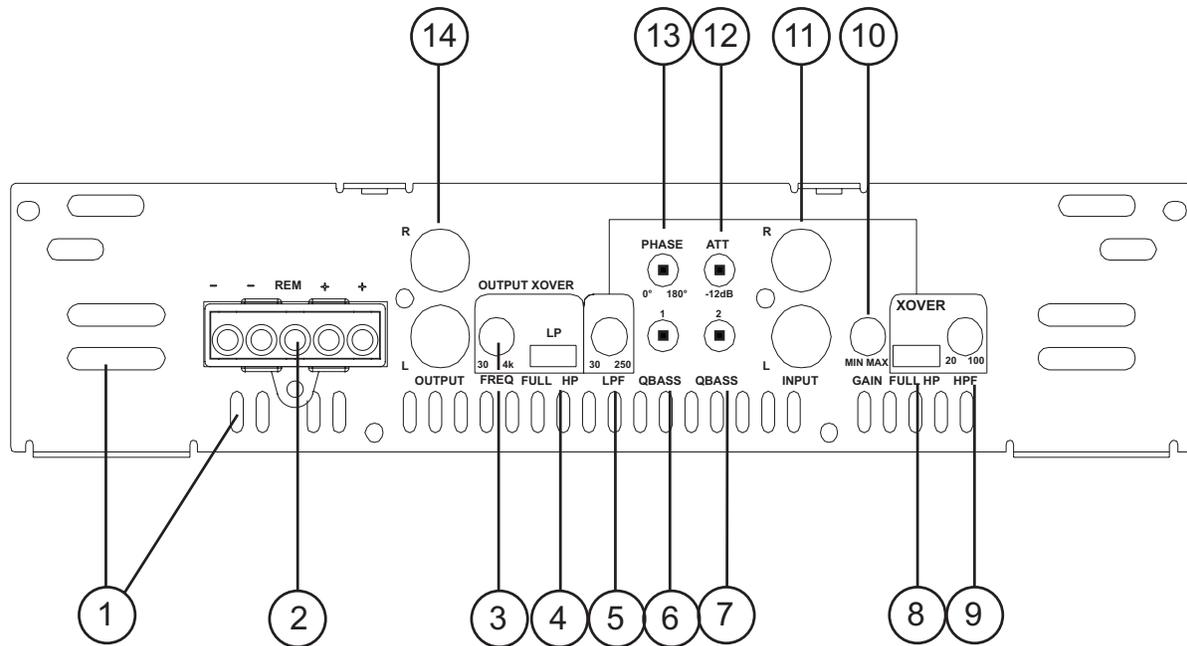
## POWERLOCK CONNECTORS

Once you have run both the power and ground wires, then connect the cables to the amplifier. Cut off excess wire, and using wire strippers, strip the ends of the power and ground cables approximately 1/4 inch. Locate the *PowerLock™* power and ground connector (supplied). Using a hex wrench, loosen the screws before attempting to insert the cable wires. Insert the wires into the appropriate hole, and tighten the screws. The Power/Ground *PowerLock™* will accommodate 4 gauge wire for these amplifiers.

**Note: The amplifier comes with the connector inserted into the amplifier with the wire clamping screws in the up position as shown below. Use a 3mm hex head wrench to secure the wires to the connector. If the connector needs to be unplugged from the amplifier, use a 2.5mm hex head wrench to remove the two retaining screws from the connector (set aside and save the retaining screws).**



## FRONT PLATE DIAGRAMS



**1. Cooling Plenums:** Maintain a minimum 2" clearance around cooling plenums for proper amplifier cooling.

**2. Speaker/Remote Connector:** The *PowerLock™* speaker connector.

**3. Output Freq. Control:** Use this control to adjust the sub bass output signal crossover frequency from 30Hz to 4kHz. (See the Crossover Frequency chart in this manual).

**4. Output HP/LP/FULL Switch:** Select the desired crossover setting HP/LP/FULL for the signal of the RCA outputs.

**5. LPF Frequency Control:** Allows adjustment of the LPF between 30Hz and 250Hz.

**6 & 7. QBASS™ 1 and QBASS™ 2 Freq.:** Use these switches, *QBASS™ 1* and *QBASS™ 2* to program the *QBASS PLUS™* circuit frequency.

**8. Xover FULL/LP/HP Switch:** Select the desired crossover setting FULL/HP.

**9. Sub Sonic Adjustment:** Adjusts the crossover between 20Hz and 100Hz.

**10. Gain:** Use this control to match the output level of the source unit to the amplifier.

**11. Input:** Plug in the RCA leads from your source here.

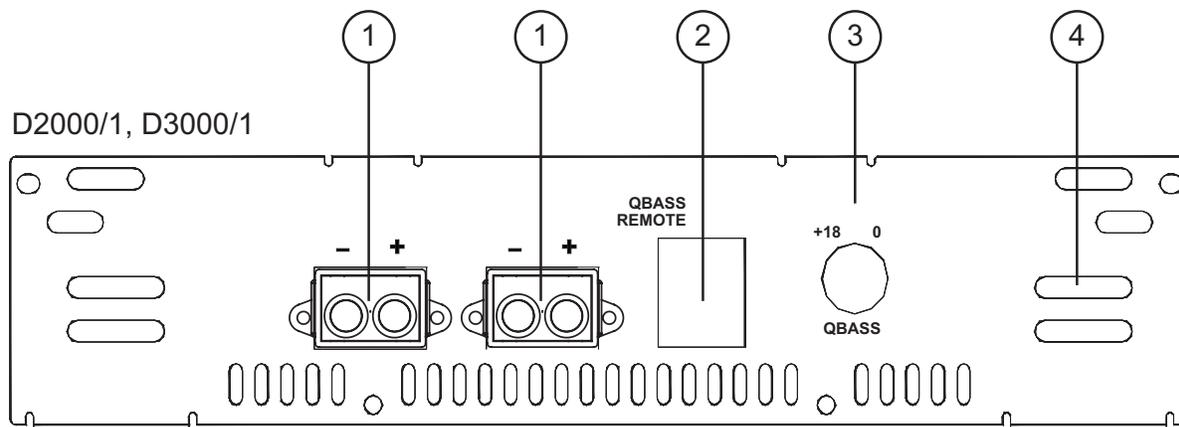
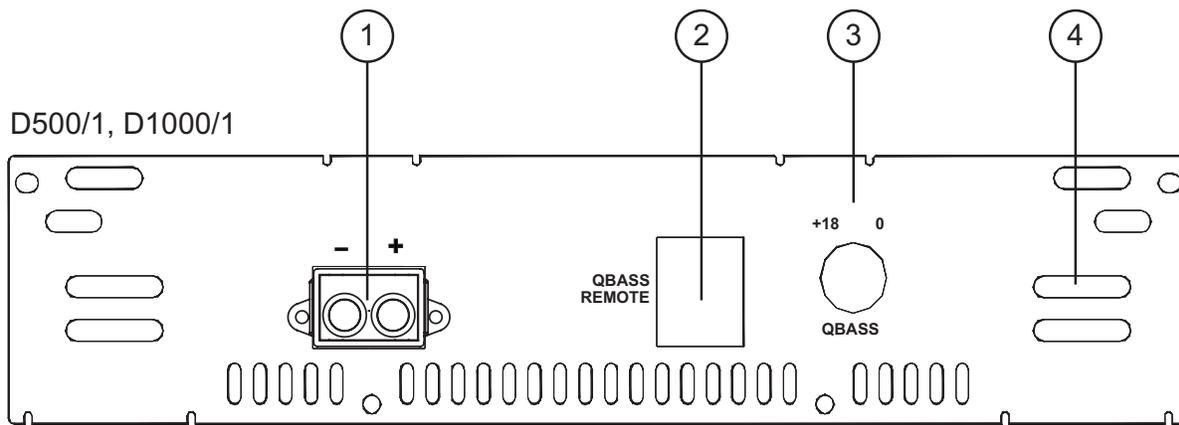
**12. -12dB Input Attenuation:** Push this switch 'IN' for high voltage (4V-12V) capability. This button pushed 'IN' must be used for speaker level input on common ground head-units or for high voltage line drivers.

**13. Phase:** These switch sets the phase of the output relative to the amplifier input.

**14. RCA Outputs:** RCA outputs provide HP/LP/FULL 30-4kHz signal to another amplifier.

## END PLATE DIAGRAMS

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**1. Power/Ground *PowerLock™*:** Note that the D2000/1 and D3000/1 have two of these receptacles. You must connect the power and ground cables to both *PowerLock™* terminals for optimum operation.

**2. *QBASS REMOTE™*:** Plug in the data cable from the optional *QBASS REMOTE™* dash mounted level control here. (The remote level control will bypass the amplifier's on board *QBASS™* control.)

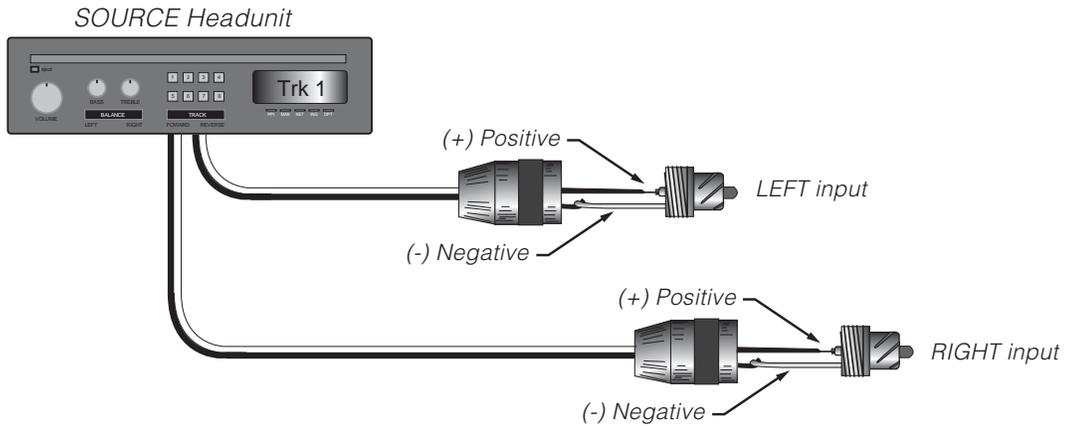
**3. *QBASS™* Level Control:** Controls bass boost, centered at 40Hz with up to 18dB of boost.

#### 4. Cooling Plenums: Maintain a minimum 2" clearance around cooling plenums for proper amplifier cooling.

### INPUTS

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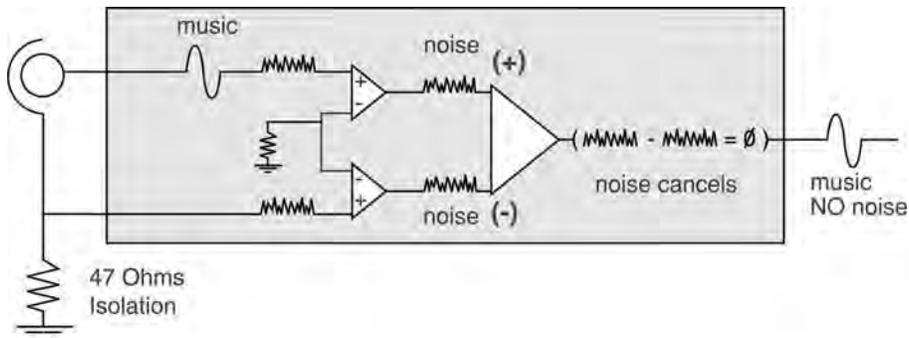
There are two sets of RCA jacks on the front end of your amplifier. The RCA cables from your source unit go in the set labeled INPUTS. If your source unit doesn't have RCA outputs, then add a set of RCA plugs (available at your dealer) to your front or rear set of speaker leads (see drawing below). Plug them into the input jacks, and push in the **-12dB** input attenuation switch.



### ADVANCED INSTRUMENTATION INPUT

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The Advanced Instrumentation Input has been incorporated from the legendary *Precision Power™ 2500F1*. This circuit completely isolates the chassis ground from the audio circuit of the amplifier and reduces noise radiated into your signal cables by up to 40dB. This is equivalent to a noise reduction of approximately one hundred times what the noise level would be without this circuitry. It provides all the benefits of a true balanced line without the need of any special cables (see diagram below). This type of input works with any conventional RCA cables.



## **QBASS PLUS SPECIFICATIONS**

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### ***QBASS PLUS™***

Up to 18dB of boost with selectable center frequency at 30Hz, 36Hz, 44Hz or 60Hz, with a Q-factor of 2.

### Optional ***QBASS REMOTE™***

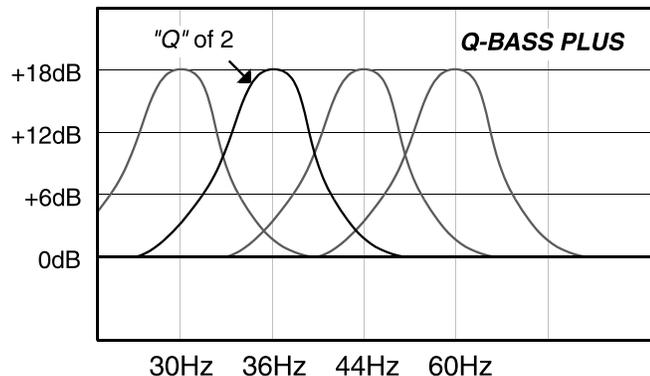
This boost control can be mounted in the dash and will supersede the boost control on the amplifier endplate.



## QBASS PLUS/QBASS REMOTE

On these amplifiers, we've taken bass control to a higher level with **QBASS PLUS™**. The two **QBASS™** switches (labeled 1 and 2) on the front end of the amplifier allow you to select one of four frequency centers 30Hz, 36Hz, 44Hz and 60Hz. On the rear end plate you will find the **QBASS™** level control and plug-in for an optional **QBASS REMOTE™** dash mounted level control. Adjust the level control clockwise for up to +18dB of boost at your selected frequency.

<b>QBASS™ Settings</b>		
1	2	Freq.
IN	IN	30Hz
IN	OUT	36Hz
OUT	IN	44Hz
OUT	OUT	60Hz



**CAUTION: QBASS PLUS™** should only be used in systems with a strong subwoofer section. +18dB is a tremendous amount of bass boost and may damage your speakers or create excessive distortion if abused.

The optional **QBASS REMOTE™**: This boost control can be mounted in the dash and will supersede the boost control on the endplate.

The *Precision Power™* amplifiers no longer need an optional **QPORT™** to connect multiple **QBASS PLUS™** equipped amplifiers while using one **QBASS REMOTE™**. The new **QBASS PLUS™** circuitry in the **DCX** amplifiers is now positioned before the crossover circuit. In doing this, *Precision Power™* engineers have allowed you to daisy chain your RCA output to the next amplifier input, causing the first amplifier's **QBASS REMOTE™** to become the master control amplifier. See your authorized *Precision Power™* dealer for more information!

## **TC-X CROSSOVER**

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Your new amplifier has a **TC-X** Crossover (Total Control X-over®) 30Hz-4kHz (see this guide for Crossover Chart). 12dB per octave phase correlated crossover built-in to provide superior system flexibility without the added expense and installation of an outboard crossover. The speaker outputs of your amplifier are high pass, low pass, or all-pass according to the HP/LP/FULL switch on the front endplate. You would choose low pass (middle position of switch) to use this amplifier for subwoofers, choose high pass (left position of switch), or full (right position of switch) to use this amplifier for full range speakers.

The RCA outputs are controlled by a separate HP/LP/FULL switch, and are always independent of the speaker output crossover. As well as being able to independently select HP/LP/FULL, your new amplifier allows independent selection of frequencies from 30Hz-4kHz (see Crossover Detent Chart in this guide).

### ***D500/1, D1000/1, D2000/1, and D3000/1***

**Output** - 24dB/Octave, Detented High Pass 30Hz-4kHz

**Output** - 12dB/Octave, Detented; HP/LP/FULL

**Sub-Sonic** - 12dB/Octave Detented; High Pass; 5Hz-80Hz

**QBASS PLUS™** - on Front Channel - up to 18dB @ 30, 36, 44, 60Hz

## CROSSOVER DETENT CHART

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Detent #	Low Pass Frequency (Hz) @ -3dB	High Pass Frequency (Hz) @ -3dB
1	31	27
2	31	28
3	31	28
4	32	28
5	32	28
6	34	29
7	36	30
8	39	31
9	42	33
10	45	35
11	50	37
12	55	40
13	58	42
14	65	45
15	71	48
16	78	50
17	88	52
18	100	55
19	115	58
20	119	62
21	124	70
22	131	75
23	137	75
24	142	80
25	149	80
26	157	82
27	165	85
28	176	85
29	190	90
30	205	95
31	210	100
32	213	100
33	216	103
34	220	108
35	224	108
36	228	108
37	234	108
38	238	110
39	242	110
40	242	110
41		110

## **ADJUSTING INPUT GAIN**

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1. Adjust all amplifier input gain controls to just above minimum sensitivity (fully counterclockwise).
2. Using the cleanest music source (CD) playing, turn up the head unit source volume until you can hear distortion. Now turn it down a bit until you cannot hear the distortion (usually just below full volume).
3. Increase the amplifier gain (clockwise) until the onset of audible distortion. Then decrease the gain to the point just before the distortion starts. This setting minimizes background noise and prevents overload.
4. Repeat step 3 for any remaining independently controlled amplifiers (rear and subwoofer gain controls) in the system.

## **HIGH MASS INTERNAL HEATSINK**

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The unique heatsink on your amplifier has been designed with fins on the inside of the aluminum extrusion. This allows for the transfer of heat from the circuitry to the heatsink fins and out through the vents in the endplates. Be sure you provide ample space around the amplifier for cooling: at least 2" on all sides.

## **AP-IV PROTECTION CIRCUIT**

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Short Circuit Protection engaged: These amplifiers will turn off and try to come back on immediately. The amplifier will cycle like this indefinitely with "blips" of sound each time. If this is the case, check your speakers and wiring for low impedance and short circuits.

Thermal Protection engaged. The amplifier will turn off and after a minute or so will come back on. In this case, ensure that there is nothing blocking the normal convection airflow of the amplifier. No obstruction should be within 2" of the amplifier on all sides.

**Note: Low battery voltage will cause the amplifier to run warmer and possibly damage the amplifier.**

## **TROUBLESHOOTING**

NO SOUND Is the LED illuminated?

**YES**

**NO**

Check Power and Remote  
turn-on wire for voltage.  
Make sure the ground wire  
is secure.

STILL NO SOUND

See your Authorized *Precision Power™* Dealer or call 1-800-62POWER.

SOUND IN ONE CHANNEL ONLY

Reverse the left and right speakers by unplugging the speaker connector,  
turning it over and plugging it back in.

SOUND IS NOW IN

**OPPOSITE CHANNEL**

Reverse RCA inputs.

**SAME CHANNEL**

Problem is in the speaker or  
speaker wire of the silent  
channel.

SOUND IS NOW IN

**OPPOSITE CHANNEL**

Reverse RCA inputs  
at head unit.

**SAME CHANNEL**

Problem is in the amplifier.  
See your local Authorized  
*Precision Power™* Dealer or  
call 1-800-62POWER.

SOUND IS NOW IN

**OPPOSITE CHANNEL**

Problem is in the head  
unit or before the amplifier.

**SAME CHANNEL**

Problem is in the RCA  
cables.

## LIMITED TWO YEAR CONSUMER WARRANTY:

Directed Electronics promises to the original purchaser, to replace this product should it prove to be defective in workmanship or material under normal use, for a period of two years from the date of purchase by the dealer as indicated by the date code marking of the product PROVIDED the product was installed by an authorized Directed dealer. During this two-year period, there will be no charge for this replacement PROVIDED the unit is returned to Directed, shipping pre-paid. If the unit is installed by anyone other than an authorized Directed dealer, the warranty period will be 1 year from the date of purchase by the dealer as indicated by the date code marking of the product. During this 1-year period there will be no charge for this replacement PROVIDED the unit is returned to Directed, shipping pre-paid. This warranty is non-transferable and does not apply to any unit that has been modified or used in a manner contrary to its intended purpose, and does not cover damage to the unit caused by installation or removal of the unit. This warranty is void if the product has been damaged by accident or unreasonable use, neglect, improper service or other causes not arising out of defects in materials or construction. ALL WARRANTIES INCLUDING BUT NOT LIMITED TO EXPRESS WARRANTY, IMPLIED WARRANTY, WARRANTY OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, AND WARRANTY OF NON-INFRINGEMENT OF INTELLECTUAL PROPERTY ARE EXPRESSLY EXCLUDED TO THE MAXIMUM EXTENT ALLOWED BY LAW, AND DIRECTED NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY LIABILITY IN CONNECTION WITH THE SALE OF THE PRODUCT. DIRECTED HAS ABSOLUTELY NO LIABILITY FOR ANY AND ALL ACTS OF THIRD PARTIES INCLUDING ITS AUTHORIZED DEALERS OR INSTALLERS. Unit must be returned to Directed, postage pre-paid, with: consumer's name, telephone number, and address, authorized dealer's name and address, and product description. IN ORDER FOR THIS WARRANTY TO BE VALID, YOUR UNIT MUST BE SHIPPED WITH PROOF OF INSTALLATION BY AN AUTHORIZED DIRECTED DEALER. ALL UNITS RECEIVED BY DIRECTED FOR WARRANTY REPAIR WITHOUT PROOF OF DIRECTED DEALER INSTALLATION WILL BE COVERED BY THE LIMITED 1-YEAR PARTS AND LABOR WARRANTY. Note: This warranty does not cover labor costs for the removal and reinstallation of the unit. BY PURCHASING THIS PRODUCT, THE CONSUMER AGREES AND CONSENTS THAT ALL DISPUTES BETWEEN THE CONSUMER AND Directed SHALL BE RESOLVED IN ACCORDANCE WITH CALIFORNIA LAWS IN SAN DIEGO COUNTY, CALIFORNIA.

