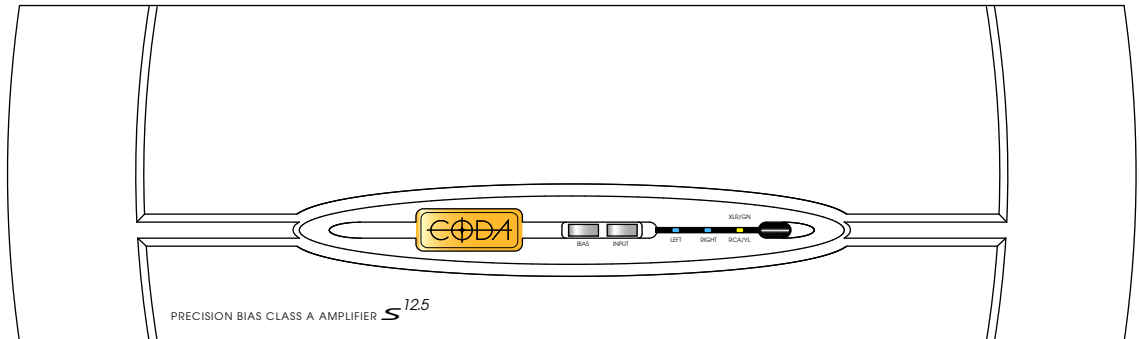




TECHNOLOGIES INC.

# Amplifier S12.5 OPERATION MANUAL



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<b>CAUTION</b>		
	<b>WARNING</b>	
<b>CAUTION:</b> TO PREVENT ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE, REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.		
	THIS SYMBOL IS TO ALERT YOU OF THE PRESENCE OF UNINSULATED DANGEROUS VOLTAGE WITHIN THE UNIT'S ENCLOSURE THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.	
	THIS SYMBOL IS INTENDED TO ALERT YOU OF THE PRESENCE OF IMPORTANT OPERATING AND MAINTENANCE INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THE UNIT.	

**WARNING:** TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE. TO AVOID ELECTRICAL SHOCK, DO NOT OPEN THE UNIT. REFER SERVICING TO QUALIFIED PERSONNEL.

- CAUTION** - Never install or remove the power cord from the chassis unless it has been disconnected from the AC power source first.
- Never pull on the power cord when removing it from an AC power source. Grasp it by the plug.
  - Do not leave the power cord connected to an AC power source unless it is connected to the unit.
  - It is recommended that during extended periods of nonuse the unit's power cord be unplugged from its AC power source.
  - Route the AC power cord so that it will not be damaged or walked on.

Thank you for purchasing the AMPLIFIER S12.5.

This amplifier is a precision device, designed in an effort to provide the listener with unmatched sound quality through superb design and construction.

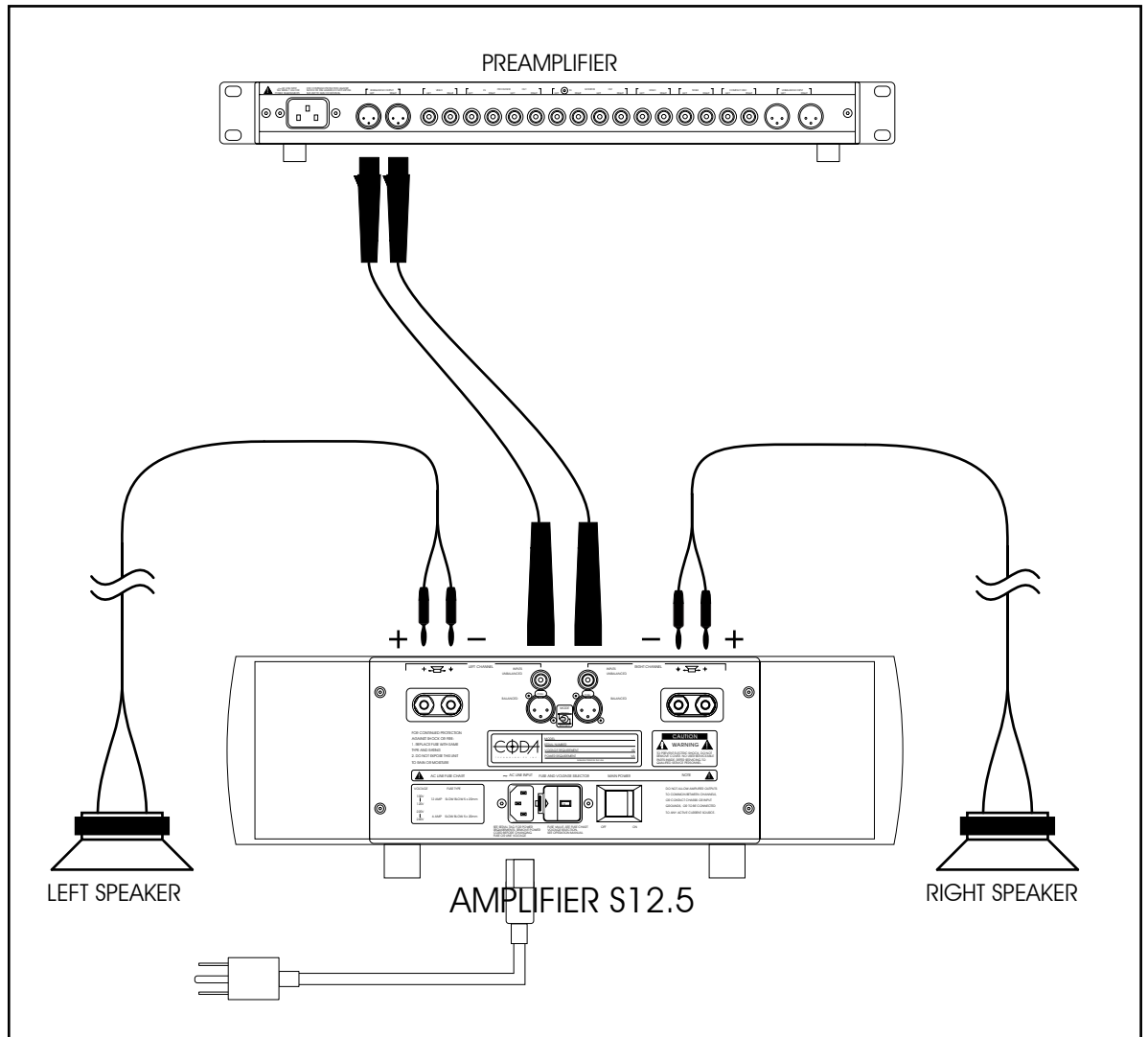
Although its operation is fairly simple, in order to operate your amplifier properly and to realize all of the capabilities of the S12.5 we recommend that you read this entire manual carefully.

**WARNING:** Please ensure that the power switch is turned OFF while you are connecting the amplifier. Connecting or disconnecting cables while the amplifier is powered on could cause damage to your speakers.

The diagram below shows the default connections necessary to operate the AMPLIFIER S5.5 as a stereo amplifier. This is the simplest and most common mode of operation, and the quickest way to get started.

**Note:** Ensure that the MODE switch located between the input jacks on the rear of the amplifier is set to the STEREO position for normal operation. Bridged operation is explained on page 7.

Stereo Amplifier Configuration



## I. Connections

The connectors and controls are clearly marked on the back panel of the AMPLIFIER. Note the correct left or right channel orientation. The function and channel markings on the rear panel correspond to the front panel controls and their signal paths.

1. The UNBALANCED and BALANCED inputs should be attached to the appropriate unbalanced and balanced outputs of a preamplifier either directly or through a crossover or processor, as appropriate to the application.
2. The LEFT OUTPUT and RIGHT OUTPUT should be attached to the left and right speakers.

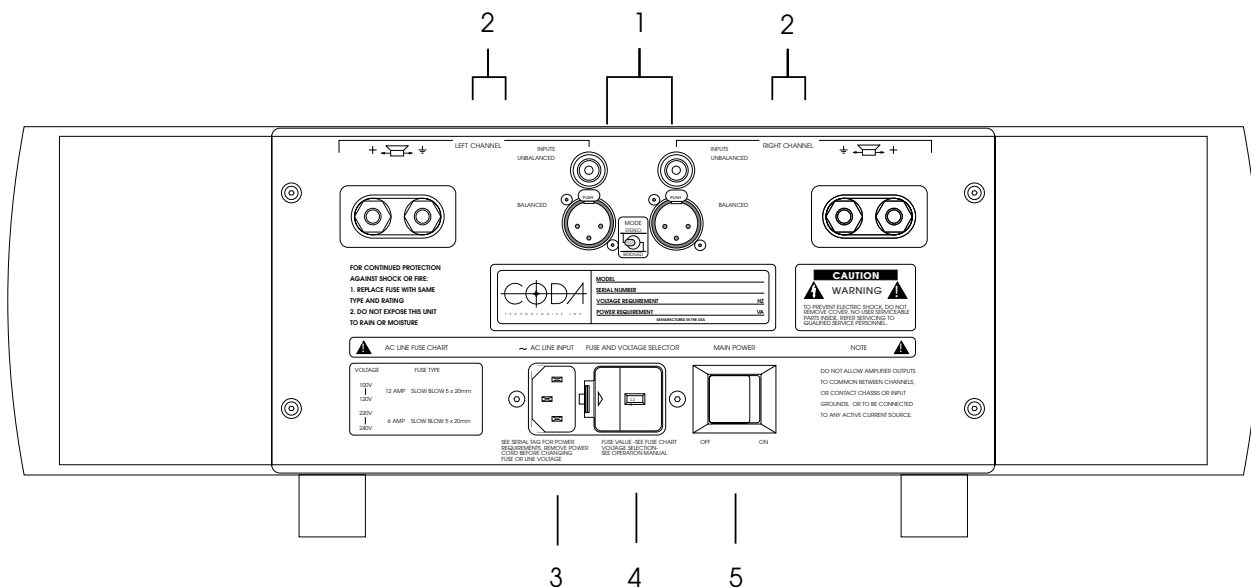
**WARNING:** There are no fuses on the amplifier's outputs in order to cut down on output impedance effects. Speaker protection is left to the manufacturer of your speakers, as they would best know how to protect their product.

3. The AC LINE INPUT should be connected to an AC outlet with the power cable provided with the amplifier.

4. The FUSE AND VOLTAGE SELECTOR unit houses a 5x20mm slow-blow fuse and a voltage selector cartridge. Ensure that the voltage, visible through a small window next to the AC input, is set to the appropriate voltage for your country. When changing voltages, ensure that the power cable is disconnected from the amplifier.

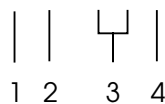
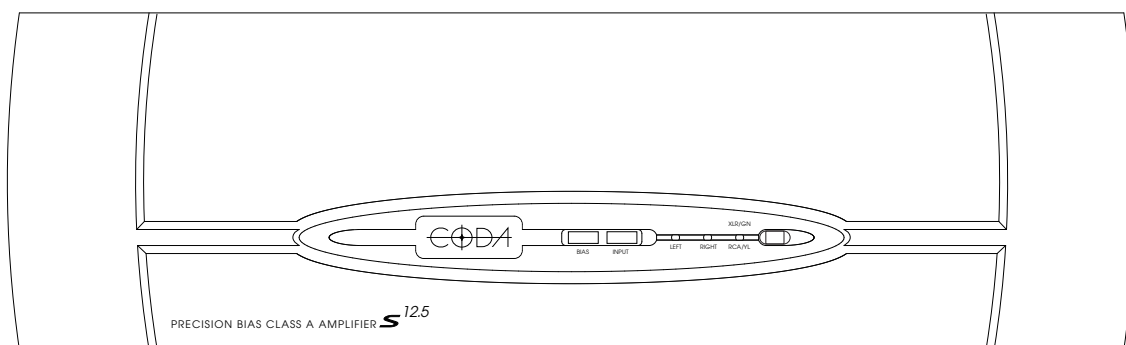
**Note:** If the fuse in your amplifier blows, contact a Coda dealer or call Coda directly before attempting to use the amplifier again.

3. The POWER SWITCH can usually be left on when the amplifier is functioning correctly. With the bias disabled the amplifier will draw negligible current and can thus be left in "standby" indefinitely.



## II. Front Panel Control Functions and Indicators

1. The BIAS button enables the bias, effectively "turning on" the amplifier's components, and opens shunting relays that mute the input.
2. The INPUT SELECTOR button switches between the balanced and unbalanced inputs.
3. These LEDs, when lit, indicate that the bias is enabled and muting is off.
4. This two color LED indicates that the main power is on. When it is red the balanced inputs are in use. When it is yellow the unbalanced inputs are in use.



**Note:** If a power interruption occurs to the system the amplifier will power on with the bias off. Press the BIAS button to resume use of the amplifier.

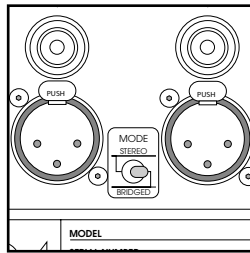
III. BRIDGED SETUP

**WARNING:** Disconnect the amplifier's power cord from the AC supply and set the power switch to OFF before adjusting the mode switch or connecting or disconnecting any cables to avoid potential damage to your speakers.

The S12.5 normally operates in stereo mode, providing a maximum output power of 50 watts Class A (into an 8-ohm load) per channel. In BRIDGED mode, both channels act as one amplifier providing a maximum output power of 200 watts. For extremely high-power multi-channel audio applications, multiple S12.5 amplifiers can be used in place of one medium-power stereo amp.

To configure the amplifier for bridged mode operation, set the mode switch on the back panel to the BRIDGED setting as shown in the diagram below.

Back of AMPLIFIER S12.5



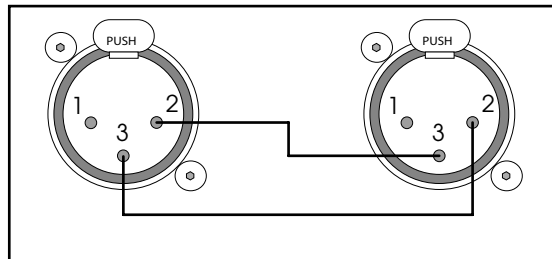
In bridged mode only one audio input is used. No other input should be connected, and the bridged mode input must be a BALANCED signal connected to the XLR receptacle labeled BRIDGED INPUT. Bridged mode will not operate correctly with an input adapted from an unbalanced signal. Connecting the input signal to the receptacle not labeled BRIDGED INPUT will cause no damage, but will cause the speaker terminal polarities to reverse, so should be avoided in the interest of consistency in labeling.

The amplifier's speaker terminals are reconfigured in bridged mode. The left channel positive terminal becomes the bridged negative terminal and the right channel positive terminal becomes the bridged positive terminal.

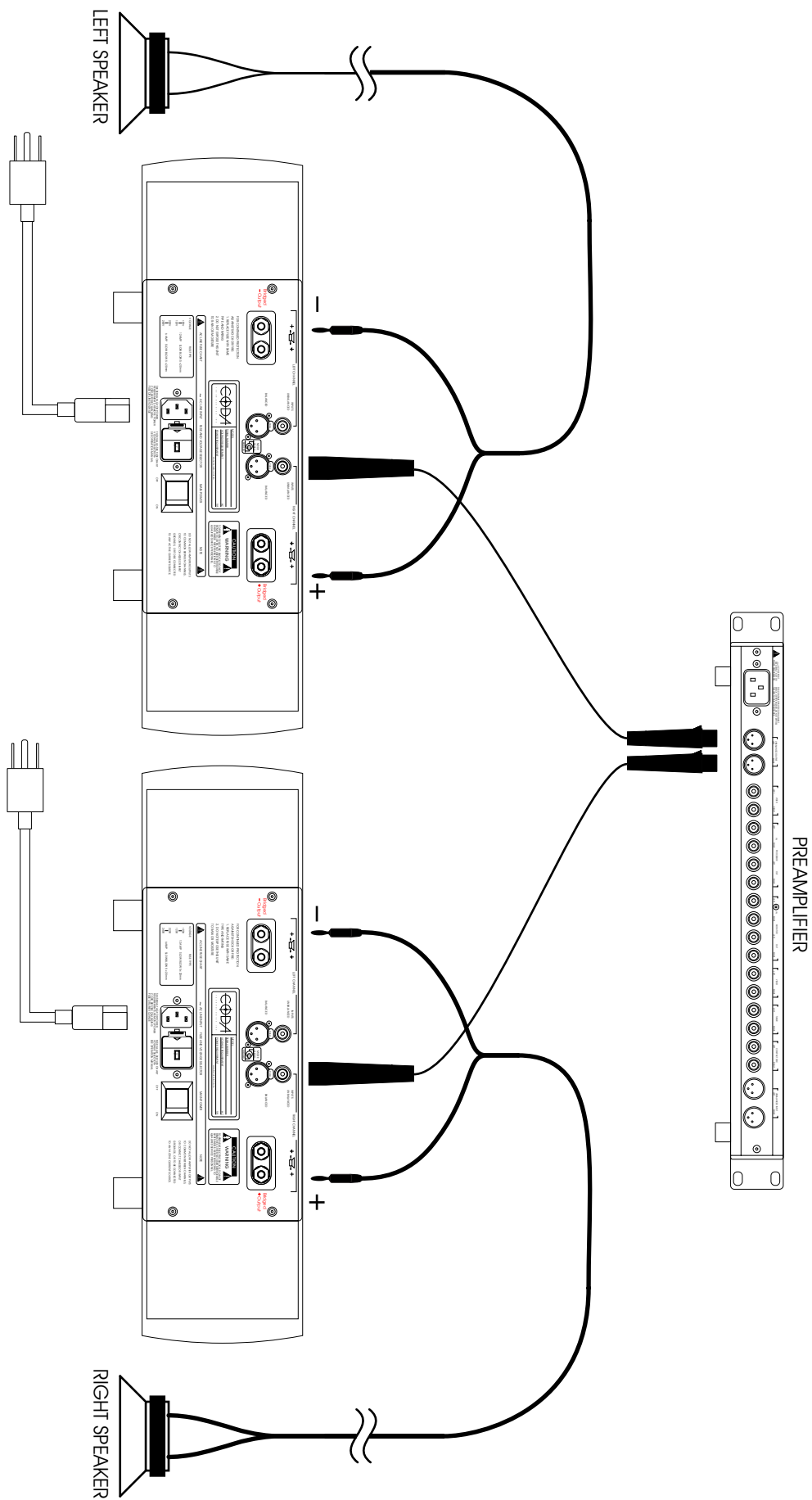
See the next page for a diagram of a stereo amplifier configuration using two bridged mode S12.5 amplifiers. Speaker terminals in the diagram are marked with their bridged mode polarities.

**Technical Note:** In bridged mode the XLR input receptacles are internally connected to each other according to the diagram below.

Bridged Mode XLR Wiring



IV. BRIDGED SETUP DIAGRAM



## I. Design Philosophy and Approach

The subtlety of the design process at this level of performance makes it impossible to easily explain all of the advantages inherent in the S12.5. However, we present here an overview to give you an understanding of some of its unique features and an idea of the listening experience you can expect. Often a particular technique has numerous unrelated advantages and possibilities. We make every effort to exploit these advantages with the final result being an amplifier that is greater than the sum of its individual features

The topology and component selection is built on the foundation established by the System 100. Balanced interconnections are provided to take advantage of their greater noise rejection as in the System 100. Differential voltage gain throughout provides exceptional rejection of external noise and contributes to the inherent DC stability of the circuit. This allows direct coupling without servo circuitry. The unit also uses output followers operating without feedback.

The front end of the S12.5 is designed to operate without ever entering Class B operation as is common in many other designs. This combined with excellent high frequency design insures linear operation at high speed, and translates into a sonic reproduction which is extremely transparent in character. The supply take a very direct approach to high performance. First, a top quality toroid transformer and over 144,000 uf of capacitance with very low ESR and inductance is used. For optimum performance and reliability all circuitry remains continuously powered.

The specifications are consistent with what would be expected in a high current Class A amplifier design. In this design, however, an unusual degree of attention has been paid to sonically meaningful parameters.

For example, the current stage is capable of producing peak currents in excess of 100 Amperes with a degree of linearity and speed which is not matched by other designs when producing only a fraction of of this current. This is achieved by the implementation of several distinct circuit features.

In the S12.5 extremely wide bandwidth output transistors are used instead of the usual TO3 devices which are used in other transistor designs. Each channel uses 30 individual output transistors with a combined power rating of 1500 Watts and 120 Amperes with a bandwidth of 50 Mhz.

The manner in which the S12.5 accomplishes Class A operation is also different than that employed in conventional designs. All Class A designs leave Class A operation when they are operated into loads of sufficiently low impedance or power levels. Generally, this transition will produce a large and abrupt distortion increase.

The S12.5 uses bias voltages and component values which have been specifically selected to produce a precision transition with no abrupt changes in distortion or output impedance. This "Precision Bias" technique yields seamless performance regardless of the complexity of the load impedance and is particularly effective at eliminating a form of IM distortion which often occurs in these instances.

### **I. Design Philosophy and Approach (continued)**

To maintain "Precision Bias" requires an advanced bias circuit that must have a very high degree of stability under a wide range of temperatures and load conditions. The usual bias network is of such high impedance and poor thermal regulation that at the extremes of operation, bias currents are ineffectively controlled. Advanced tracking techniques results in absolute control of bias currents under all conditions in the S12.5.

The main power supply of the amplifier consists of a 1500VA toroidal power transformer with independent rectifiers to isolate the channels from one another. One hundred forty-four thousand microfarads of total capacitance provide effective filtering.

The above attributes result in a amplifier of such extreme linearity and bandwidth that no overall feedback correction is required or used. One advantage of this is a high degree of immunity from interactions with loads or cables and a superior transient response. An extremely low nonreactive output impedance is maintained well beyond 20,000 hz. The resulting uniform damping factor is not usually found in other designs.

The S12.5 has all structural parts made of machined aluminum which are milled to very close tolerances yielding the seamless appearance characteristic of previous products from Coda. As with all Class A amplifiers, heat dissipation is important. The S12.5 uses four massive heat sinks for efficient, noiseless, and clean thermal relief. The thermal coefficient of the heat sinks is one of the lowest and most effective in the audio industry.

## II. Material Quality

The amplifier's chassis is made from heavy-gauge steel with a half-inch machined aluminum faceplate. All exterior metal parts are anodized or powder coated for durability.

Printed circuit boards are fiberglass epoxy with gold plating over a tin/nickel barrier. The gold layer will not corrode, while the barrier layer prevents the gold from migrating to the lower copper layer.

All resistors are precision metal film; 1% tolerance for 1/4-watt and 5% tolerance for 1-watt.

Capacitors have been eliminated wherever possible. No electrolytic capacitors are used except in the power supply, where several high-capacitance electrolytics provide outstanding filtering of the supply output.

All semiconductor devices are of very high grade. Voltage gain is accomplished with an extremely high-quality, matched dual FET, chosen for its exceptionally low noise characteristics.

All audio input and output connector contacts are gold-plated, and XLR receptacles are manufactured by Neutrik of Switzerland. Wire is used as little as possible in the signal path - only to connect the RCA jacks and speaker terminals to the circuit board - and what is used is 141-strand silver-plated copper with silicone insulation.

**STEREO**

Rated Power:	125 Watts @ 8 Ohms
Frequency Response:	DC to -3dB @ 100kHz
Distortion:	< .03 percent from 10Hz to 20kHz @ 125 Watts
Gain:	26dB
Maximum Current:	>100 Amperes peak per channel
Noise:	-120dB referenced to rated output
input Impedance:	50k Ohms unbalanced/1k Ohms balanced
Output Impedance:	.03 Ohms from 20Hz to 20kHz

**BRIDGED MONO**

Rated Power:	500 Watts @ 8 Ohms
Frequency Response:	DC to -3dB @ 100kHz
Distortion:	< .03 percent from 10 Hz to 20kHz @ 400 Watts
Gain:	32dB
Maximum Current:	>100 Amperes peak
Noise:	-120dB referenced to rated output
Input Impedance:	1k Ohms unbalanced/1k Ohms balanced
Output Impedance:	.06 Ohms from 20Hz to 20kHz

**CLASS A/AB OPERATION**

Class A:	< 20W
Class AB:	>20W

**POWER SUPPLY**

Transformer Type:	Multi-tap, multi-winding toroidal
Transformer Rating:	1500 VA
Power Filtering:	144,000 $\mu$ F

**DIMENSIONS**

Height:	5.25" Faceplate, 6.0" Overall
Width:	19.0" Faceplate, 17.0" Chassis
Depth:	12.5" Overall
Weight:	45 lbs., 50 lbs., Shipping
Power requirement:	450 Watts maximum at rated power

The interior of the amplifier requires no special care. If exterior cleaning beyond simple dusting is required, any dilute ammonia-based product is recommended. Do not use any abrasive rags, cleaners or chemical solvents on the amplifier.

When handling the amplifier, take care not to mar the faceplate. Aluminum is a medium hardness metal and can be scratched by harder tool steels, and the grained surface can be easily marred if the amplifier is set face-down on a hard surface. Do not rest the amplifier on its faceplate.

The amplifier should not be left in direct sunlight or exposed to intense heat to avoid damage to internal components or finish.

It is recommended that you do not throw away any shipping material. The box and packing materials are ideal for moving, and if any service is required they will be necessary for safe shipment.



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