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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 recommend that during extended periods of non-use that the units 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 S20.

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

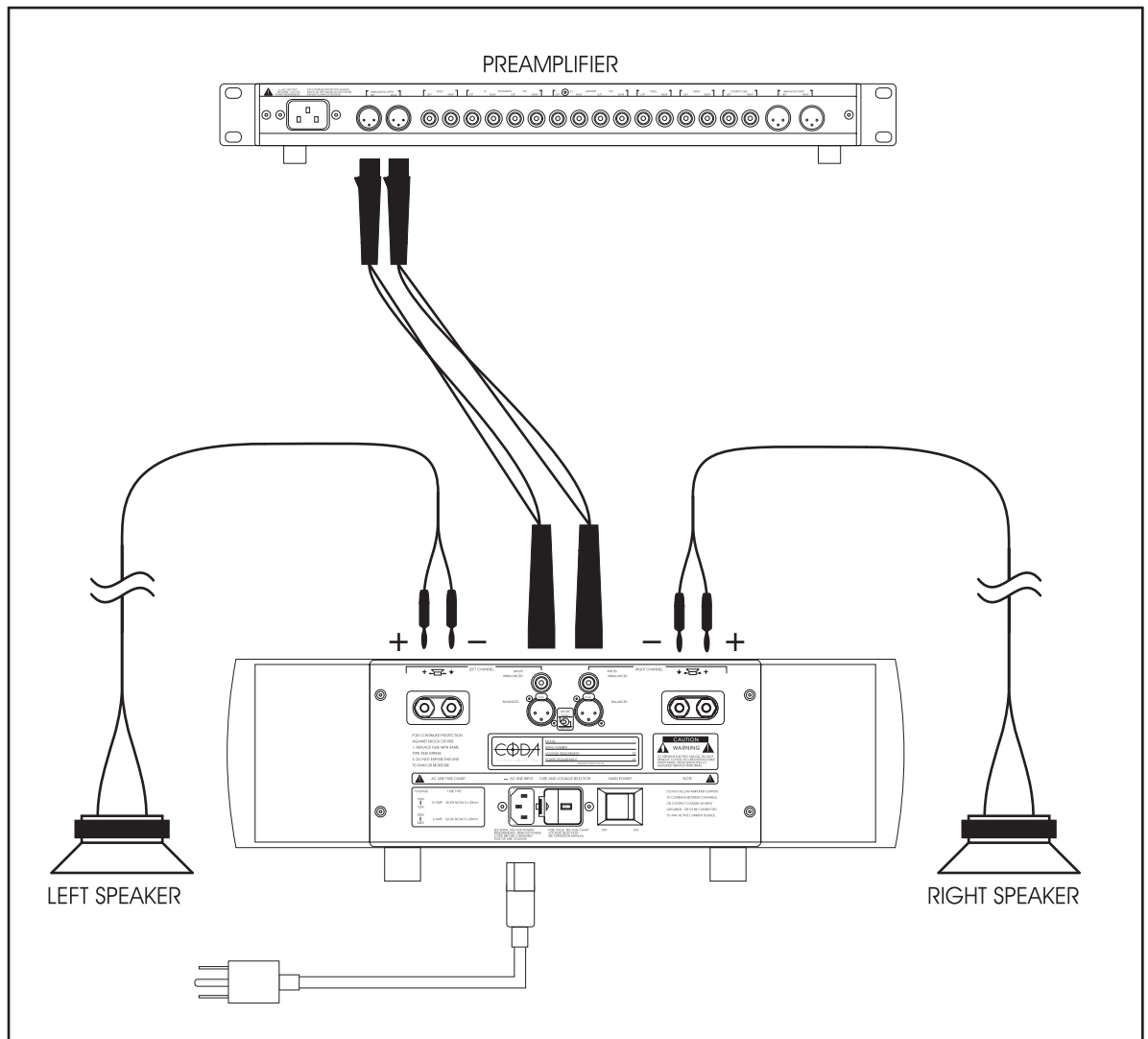
Although its operation is fairly simple, in order to operate your amplifier properly and to realize all of the capabilities of the S20 we recommend that you read this entire manual carefully.

**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 S20 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.

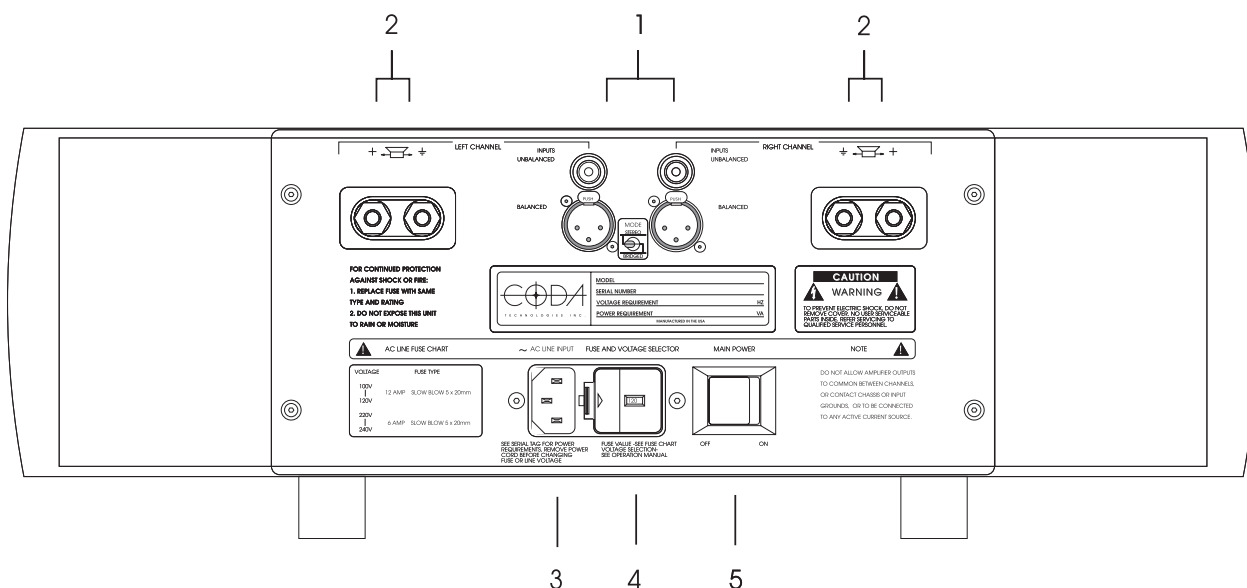
- 1.The UNBALANCED and BALANCED inputs should be attached to the appropriate unbalanced and balanced outputs of a preamplifier either directly or through a crossover or processor, as appropriate to the application.
- 2.The LEFT OUTPUT and RIGHT OUTPUT should be attached to the left and right speakers.

**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.

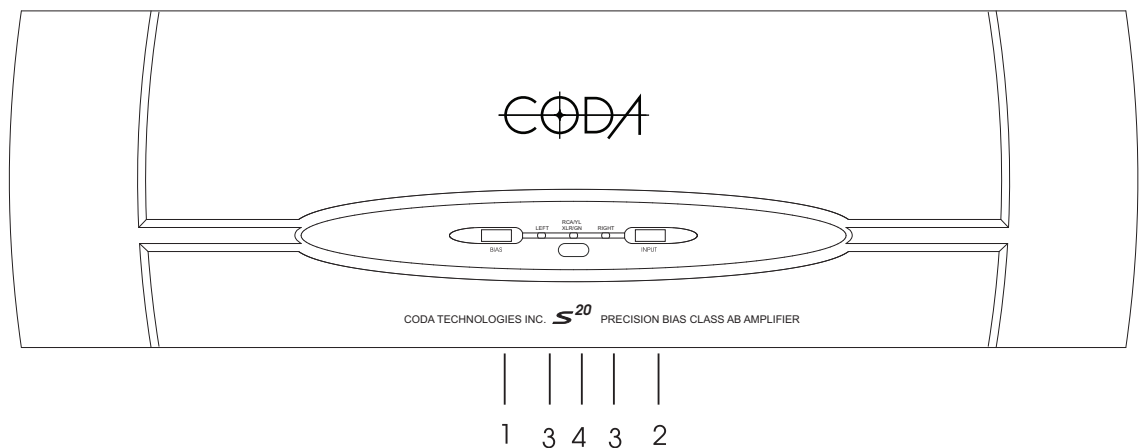
**Note:** If the fuse in your amplifier blows, contact a Coda dealer or call Coda directly before attempting to use the amplifier again.

- 5.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.



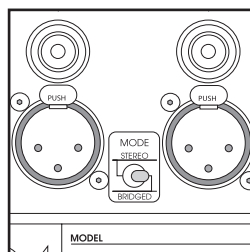
**Note:** If a power interruption occurs to the system the amplifier will power on with the bias off. Press the BIAS button to resume use of the amplifier.

### 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 S20 normally operates in stereo mode, providing a maximum output power of 10 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 800 watts. For extremely high-power multi-channel audio applications, multiple S20 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.



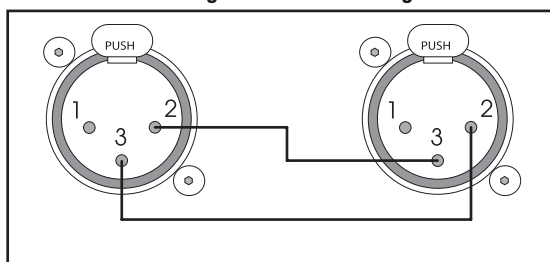
In bridged mode only one audio input is used. No other input should be connected, and the bridged mode input must be a **BALANCED** signal connected to the XLR receptacle labeled **BRIDGED INPUT**. Bridged mode will not operate correctly with an input adapted from an unbalanced signal. Connecting the 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.

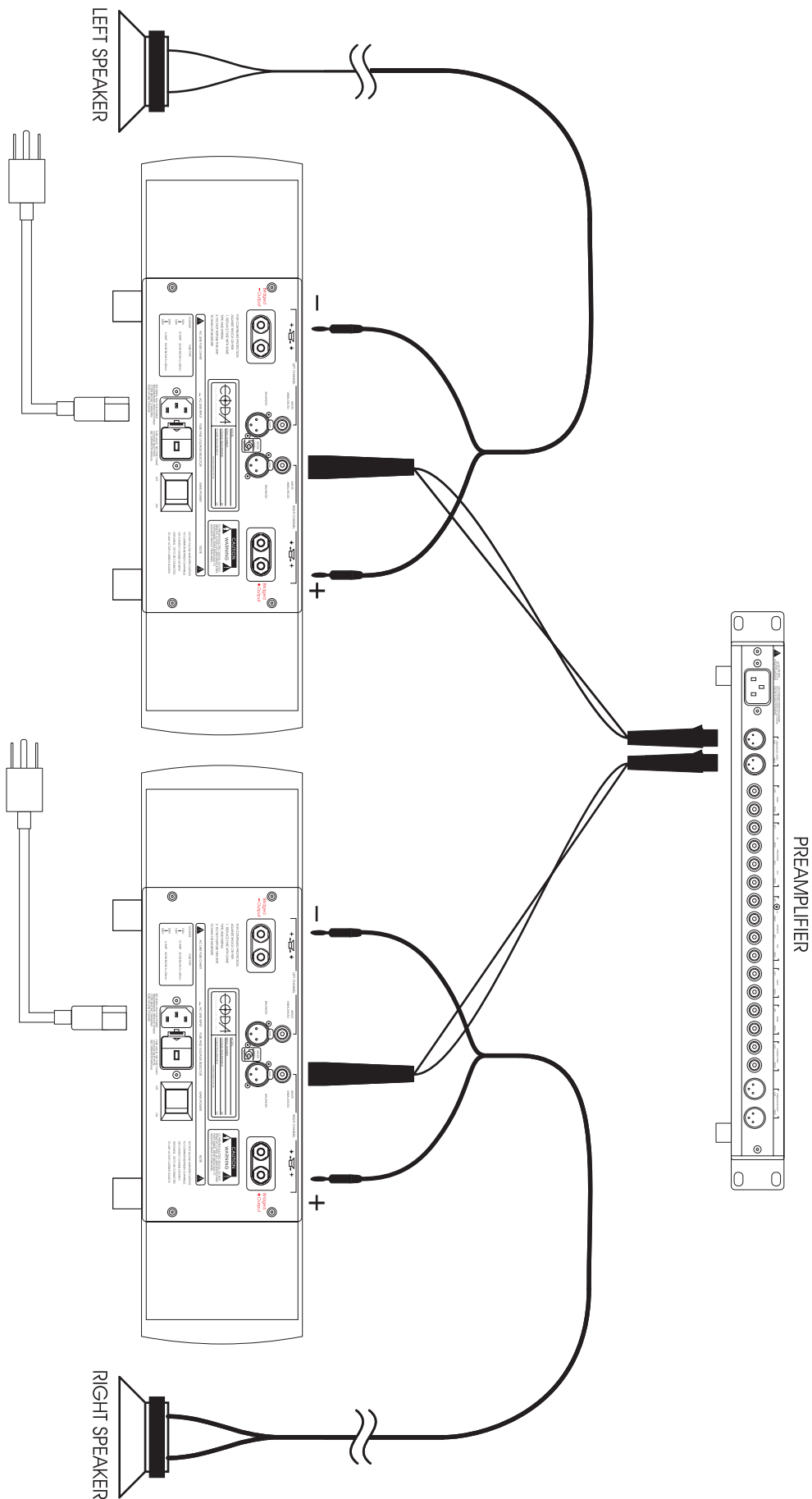
See the next page for a diagram of a stereo amplifier configuration using two bridged mode S20 amplifiers. Speaker terminals in the diagram are marked with their bridged mode polarities.

**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 S20. 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 S20 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 takes a very direct approach to high performance. First, a top quality toroid transformer and over 80000 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.

The S20 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 S20.

The main power supply of the amplifier consists of a 1500VA toroidal power transformer with independent rectifiers to isolate the channels from one another. Eighty 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 non-reactive output impedance is maintained well beyond 20,000 Hz. The resulting uniform damping factor is not usually found in other designs.

The S20 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 amplifiers, heat dissipation is important. The S20 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:	200 Watts @ 8 Ohms
Frequency Response:	-3dB @ DC to 100kHz
Distortion:	< .04% from 10Hz to 20kHz @ 50W
Gain:	26dB
Maximum Current:	100 Amperes peak per channel
Noise:	Less than 120dB referenced to rated output
Input Impedance:	50k Ohms unbalanced/10k Ohms balanced
Output Impedance:	.04 Ohms from 20Hz to 20kHz

**BRIDGED MONO**

Rated Power:	800 Watts @ 8 Ohms
Frequency Response:	-3dB @ DC to 100kHz
Distortion:	< .04% from 10Hz to 20kHz @ 50W
Gain:	26dB
Maximum Current:	100 Amperes peak per channel
Noise:	Less than 120dB referenced to rated output
Input Impedance:	50k Ohms unbalanced/10k Ohms balanced
Output Impedance:	.04 Ohms from 20Hz to 20kHz

**POWER SUPPLY**

Transformer Type:	Multi-tap, multi-winding toroidal
Transformer Rating:	1500 VA
Power Filtering:	80,000 $\mu$ F

**DIMENSIONS**

Height:	5.75"
Width:	17.5"
Depth:	12.5"
Weight:	45 lbs
Power requirement:	450 Watts maximum at rated power

The interior of the unit requires no special care. If it becomes necessary to clean the exterior, a simple dusting may be all that is required. If a cleaner is necessary, any dilute commercial ammonia based product will be appropriate. NEVER use any abrasive rags, cleaners or chemical solvents on Coda products.

When handling the unit, take care not to mar the aluminum. Aluminum is a medium hardness metal and can be scratched by the harder tool steels.

Avoid exposing the unit to direct sunlight, and keep it away from sources of intense heat.

Do not throw away the carton or associated packing material. They are ideal if you need to pack the unit for moving and in the unlikely event that servicing is needed, they will be necessary for safe shipment.

Be sure to provide adequate insurance when shipping.

I. Warranty - Any failure of the Amplifier S20, hereafter known as the product or original product, to operate or to meet specifications, applicable at time of manufacture, due to a manufacturing defect or component failure, will be corrected by Coda Technologies without charge for parts or labor, for a period of ten years from date of original purchase. Coda Technologies will provide for surface transportation to and from the factory for a period of one year from date of original purchase.

II. Procedure - If the product should require service under warranty contact Coda Technologies at the location on the back cover of this manual for shipping instructions. Products purchased outside of the United States will be covered by the warranty conditions extended by the importing distributor which may differ from those given above.

III. Exclusion of Coverage - Coda Technologies is not obligated to service the product in certain conditions, as according to the following subsections.

- a. The product has been damaged through:
  - i. operation not in accordance with the instructions in this manual
  - ii. abuse, tampering, modification or accident
  - iii. serial number defacement
- b. The product has been transferred to a third party. This warranty is valid only for the original purchaser of the product.
- c. The product has been transported outside of the United States of America. In these conditions any service will be made at Coda Technologies sole option.

IV. Total Loss and Replacement - If the product is submitted for service due to a severe malfunction which has caused damage sufficient enough to make a repair attempt infeasible, the product will be replaced with another unit of equal or superior specifications. Coda Technologies product line is frequently updated and changed, and the specific model and version of the original product may be discontinued at any time without notice. In this case no guarantees are made that the replacement unit will be visually similar to the original product.

V. Subjective Differences - No guarantee is made that the product will perform to any specifications that cannot be measured and confirmed with precision audio analysis equipment. Coda Technologies is only obligated to make repairs which will bring the product into compliance with the specifications stated in this manual.

VI. Unnecessary Service - In all conditions, if the product is submitted for service and found to be operated without fault and within specifications, shipping charges will be billed to the customer.

This warranty gives you specific legal rights. You may have other rights which vary from state to state.

Disclaimer - Coda Technologies cannot be held responsible for any damage caused by their products, including but not limited to:

- a. Damage to speakers caused by failure of a Coda Technologies product to mute or disable itself as expected or described in its manual.
- b. Damage caused by connecting a load to a Coda Technologies product having an improper impedance as described in the products manual.
- c. Damage caused by defects in design, construction or component quality.

Fill in this registration sheet and fax or mail it to Coda Technologies to ensure you are in our warranty system. This will facilitate warranty service should it become necessary.

It is recommended that you retain a copy of this form for your own records. Coda Technologies' address and fax number are located on the back of this manual.

MODEL DESIGNATION: \_\_\_\_\_

SERIAL NUMBER: \_\_\_\_\_

DATE OF PURCHASE: \_\_\_\_\_

PLACE OF PURCHASE

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_

OWNER INFORMATION

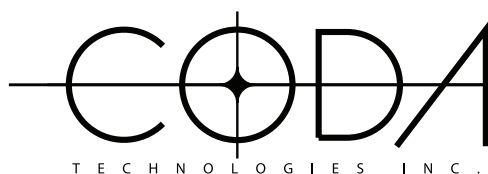
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Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

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