

# Stereo 90

Vacuum Tube Power Amplifier



## Owner's Manual

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## INTRODUCTION

Congratulations on your purchase decision! We at Rogue Audio truly believe that our amplifiers provide the “smartest” value in high-end audio. If you have never owned a vacuum tube amplifier you will be thrilled by the silky-smooth sound and incredible detail that only a tube amplifier can provide. And with the Stereo 90 amplifier, you can be sure that you are getting the very best in tube amplification. We at Rogue Audio are extremely proud of our products and want you to enjoy them to their fullest potential. So please, take the time to read through this short manual so that you can be confident that you have set up your amplifier properly.

### UNPACKING THE STEREO 90 POWER AMPLIFIER

**Tools required:** # 2 Philips Screwdriver

**WARNING - This amplifier uses voltages that could cause injury or death. Never open the amplifier while it is plugged in, and always wait at least one hour after turning the unit off to unplug and open the unit. *Lethal* voltages can remain in the electronics after the unit is unplugged.**

The Stereo 90 amplifier has been painstakingly inspected for cosmetic flaws during and after assembly. In order not to damage the cosmetic appearance of your amplifier it is important that you follow the unpacking instructions carefully.

1. Remove the Styrofoam packing material from the box, and remove the two small white boxes. One of the boxes contains the Output Tubes, while the other contains the power cord.
2. Lift the unit from the box, and carefully remove the protective plastic bag. Remove the shipping pallet from the bottom of the amp. The pallet serves two purposes. First, and foremost it acts to tie down the mechanically isolated transformer platform. Secondly, it provides strength to the main chassis. Both of these are critical to ensure that no damage occurs in transit.
3. Save the packing materials. The packing materials and box have been carefully designed to protect your valuable equipment during shipping so you don't want to throw them away.
4. Remove the top cover of the amp using a #2 phillips screw driver to remove the 10 cover screws. Using a glove or a clean dry cloth , install the tubes using the diagram in Figure 1. The Output Tubes will have a label designating their proper locations.

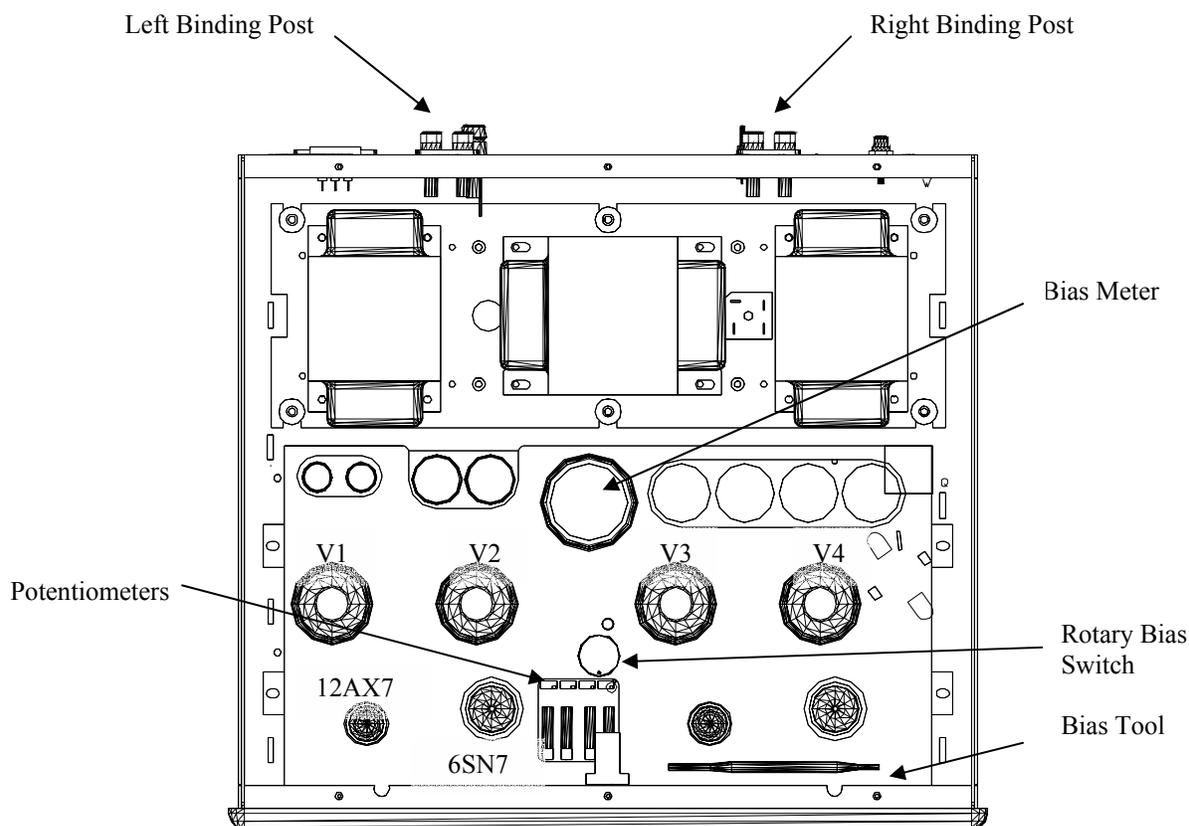


Figure 1 Tube and Deck Layout

## INSTALLING THE STEREO 90 INTO YOUR SYSTEM

### Connecting the Stereo 90 to the Loudspeakers:

The Stereo 90 provides options for either 4 or 8 ohm speakers. The impedance selected will depend on the speakers used. Consult either the owner's manual for your speaker or your local dealer to determine the correct choice. The amplifier is factory set to 8 ohm.

To switch impedance setting:

- 1) Using a 1/2" wrench remove the outermost nut from the positive (red) binding post.
- 2) Remove the 8 ohm tap (green wire marked 8) from the binding post. Be careful to leave the black wire with heat shrink on the post.
- 3) Remove the polyurethane tubing from the unused 4 ohm wire (yellow) and lug.
- 4) Place the 4 ohm wire onto the binding post and replace the outer nut.
- 5) Place the polyurethane tubing on the 8 ohm wire and lug.

**CAUTION – Do not operate the amplifier unless it is connected to a loudspeaker.**

### Connecting the Stereo 90 to the preamplifier:

The input connections from the preamplifier are made via RCA jacks on the rear of the amplifier. See figure 2. Be sure to use high quality interconnect cables – they do make a difference.

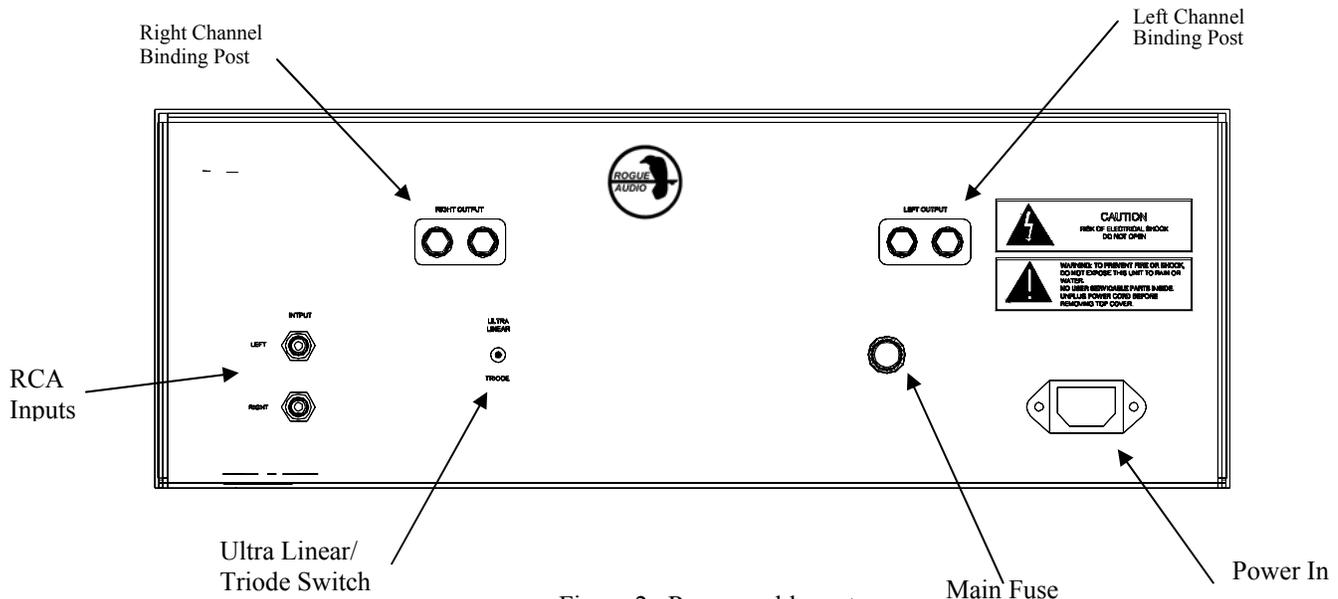


Figure 2. Rear panel layout

### Connecting the Stereo 90 to the power outlet:

Connect the IEC end of the detachable power cord (provided) to the amplifier, and plug the opposite end into the power outlet. It is recommended that the Stereo 90 and your preamp are plugged into the same wall outlet if possible (perhaps using a power outlet strip) to avoid creating a ground loop.

### Amplifier Location:

The Stereo 90 depends on natural convection flow patterns for proper cooling. To ensure proper cooling, the unit should be located in a position so that the airflow is not impeded. The unit should not be placed in a fully enclosed shelf, and should have a minimum of 8 inches of free space above it, and 6 inches of free space on either side.

## OPERATION OF THE AMPLIFIER

After all proper connections have been made, you are now ready to turn the Stereo 90 amplifier on. The power on/off switch is on the front of the amp. Some preamplifiers and sources can generate dangerous transients that can damage loudspeakers. To avoid letting dangerous transients reach your loudspeakers turn your system on in the following order:

- 1) Turn on all sources (CD, tuner, etc.) that you will be using.
- 2) Turn on the preamplifier.
- 3) Wait until preamp has stabilized.
- 4) Power up Stereo 90 amplifier
- 5) Select listening source and play music

When powering down your system turn the amplifier off first.

Note – **Important!** After turning off the amplifier, wait at least one minute to turn it back on. Do not turn it on then off and then on again in quick succession. Doing this will not allow the power supply to discharge between on/off cycling and may result in transient noises.

### **Triode/Ultralinear switch:**

This switch is located on the back panel of the amp. See Figure 2. The output transformer of a tube amplifier acts as the electrical interface between the very different impedances of the loudspeaker and the tube circuitry. There are three fundamental ways that the output transformer can be connected to the tube circuit.

- 1) Tetrode or Pentode connection – In this configuration, the highest power level is achieved but at the expense of significantly higher distortion levels. Practically speaking, this mode of operation is sonically inferior and has been disregarded in the Stereo 90 design.
- 2) Triode connection – With this configuration, the lowest level of distortion is achieved but at the expense of output power. In the case of the Stereo 90, its power level in triode is high enough that it will likely provide plenty of power for almost any speaker load.
- 3) Ultralinear operation – With this configuration, power levels near those of tetrode mode are achieved with low distortion levels that approach those of triode operation. For loudspeakers that demand very high levels of power, ultralinear should provide excellent sound and plenty of power.

The triode/ultralinear switch allows the user to operate the Stereo 90 in either of the two modes. In general, the sonic differences are subtle but for a given loudspeaker one mode is likely to sound better than the other. There is a complex relationship between the output transformer and the crossover network so try both and see which one works best in your system. This switch can be operated while the amplifier is playing but you will hear a small relay noise through the loudspeaker.

## SETTING THE TUBE BIAS

**Tools required:** bias tool (provided with amplifier)

The output tubes (the big ones) need to be “biased” with a grid voltage that controls the flow of electrical current through the tube. Tube biasing on the Stereo 90 amplifier has been designed to be both simple and effective. On some amplifiers biasing is done for two or more tubes simultaneously. With this method, the total current flowing through the group of tubes may be correct, but the current flow through any individual tube may vary significantly from the optimal value. With the Stereo 90 amplifier the bias is set individually for each tube so that the correct operating point is assured. An added benefit to this approach is that, should a tube fail prematurely, the single tube can be replaced without having to purchase a matched set. Use the following procedure to set the tube bias:

**WARNING – There are dangerous and potentially lethal voltages inside this amplifier. Do not touch any part of the amplifier other than as described below. If you are uncertain about any of these instructions, please contact your dealer and have them bias the amplifier for you.**

- 1) Allow the amplifier to warm up for at least 30 minutes.
- 2) Turn the preamplifier volume completely off so that no signal is entering the amplifier.
- 3) Remove the top cover. The bias tool is snap attached to the inside top of the deck lid.
- 4) Locate the rotary switch and associated small potentiometers (they are blue and have a small screw in the top). There are four, one for each tube. Note the biasing meter.
- 5) Position the rotary switch into the corresponding tube position (ie. V1 for output tube V1).

**Note – There is a small leakage current of 5mA that flows through the meter’s shunt resistor during the tube bias setting operation. To accurately account for this, set the bias current at 5 mA lower than the desired setting.**

- 6) Using the bias tool, slowly turn the screw on the potentiometer that is adjacent to the switch until the bias meter reads ~ 35 miliamps (actually 40mA.) Turn the screw clockwise to lower the bias and counterclockwise to raise the bias. Note that there are two ends on the bias tool. Using the end with the recessed screwdriver will greatly facilitate this operation.
- 7) Repeat the above steps for each of the four output tubes.

8) Rotate the switch back into the null (first) position for operation.

As it is a quick operation, the tube bias should be checked on a regular basis.

## **TROUBLESHOOTING**

*Speaker Hum* – If hum can be heard from more than a few inches from the loudspeaker, there is probably a ground loop. Be sure to have both the amp and preamp plugged into the same outlet if possible.

*Tube will not bias* – If the meter provides a reading but the tube will not bias, the tube is probably bad. If no meter reading can be attained, check the fuse (1/4 Amp fast blow). If the fuse is bad, replace the fuse and then set the bias. If the bias will not maintain itself and the fuse blows again, the tube should be replaced.

*Bias Meter reading is too high* – Check that you do not have two of the bias switches turned on.

*Output sounds distorted* - Check the bias on the output tubes to ensure that the tubes are operating properly.

## **OWNER AND WARRANTY REGISTRATION FORM**

Included with this manual is an Owner and Warranty Registration Form. Please take a minute to fill out this card and return it to Rogue Audio. This card must be returned within 15 days of purchase to validate the warranty.

## FUSE VALUES

Main fuse located on rear panel (1) – 5 Amp slow blow  
Tube Fuses (4) – 2/10 Amp slow blow

## SPECIFICATIONS

output power	90 WPC
frequency response	5Hz – 50 kHz $\pm$ 1dB
THD	< 0.1% typ, < 1% at rated power
input sensitivity	1.0 V RMS
dimensions	14 ½" W x 19" D x 7" H
weight	60 pounds (25 Kg)
shipping weight	65 lbs (27 Kg)
power requirements	115/230V - 50/60Hz

## LIMITED WARRANTY

### Warranty Period

This product has been manufactured under the highest standards of quality and workmanship. Rogue Audio Inc. (hereinafter "Rogue Audio") warrants this product against defects in material or workmanship as follows:

With the exception of vacuum tubes, Rogue Audio warrants to the original purchaser of this product all parts of this product against defects in material and workmanship for a period of three years from the date of retail purchase. Rogue Audio warrants the vacuum tubes for a period of six months from the date of retail purchase. Any defective parts will be replaced free of charge, excluding shipping and handling.

Proof of purchase in the form of a bill of sale or recited invoice which indicates that the product is within the warranty period must be presented to obtain warranty service. Rogue Audio suggests that the purchaser retain the dealer's bill of sale as evidence of the date of retail purchase.

### What's Not Covered

This warranty does not cover cosmetic damage or any damage that results from product misuse, product abuse, installation error, connection to an improper voltage supply, accident, improper maintenance, alterations, modifications not authorized in writing by Rogue Audio, lightning, power surges, or acts of God. Use of any other than Rogue Audio factory parts may void this warranty.

This warranty does not cover the cost of parts and labor which would be otherwise provided without charge under this warranty, obtained from any source other than Rogue Audio.

This warranty applies only to consumer use of this product and does not cover any product that is used in any trade or business, or in an industrial or commercial application.

This warranty applies only to the original purchaser of this product when purchased from an Authorized Rogue Audio dealer. This warranty is not transferable.

This warranty is valid only in the United States.

#### YOUR RIGHTS

ROGUE AUDIO LIMITS ITS OBLIGATIONS UNDER ANY IMPLIED WARRANTIES UNDER STATE LAWS TO A PERIOD NOT TO EXCEED THE WARRANTY PERIOD. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, AND SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

### To Obtain Service

To obtain service, you must contact Rogue Audio and obtain a return authorization number. The product must be delivered to Rogue Audio in its original packaging prepaid at the following address:

**Rogue Audio Inc.  
3 Marian Lane  
Brodheads ville, PA 18322**