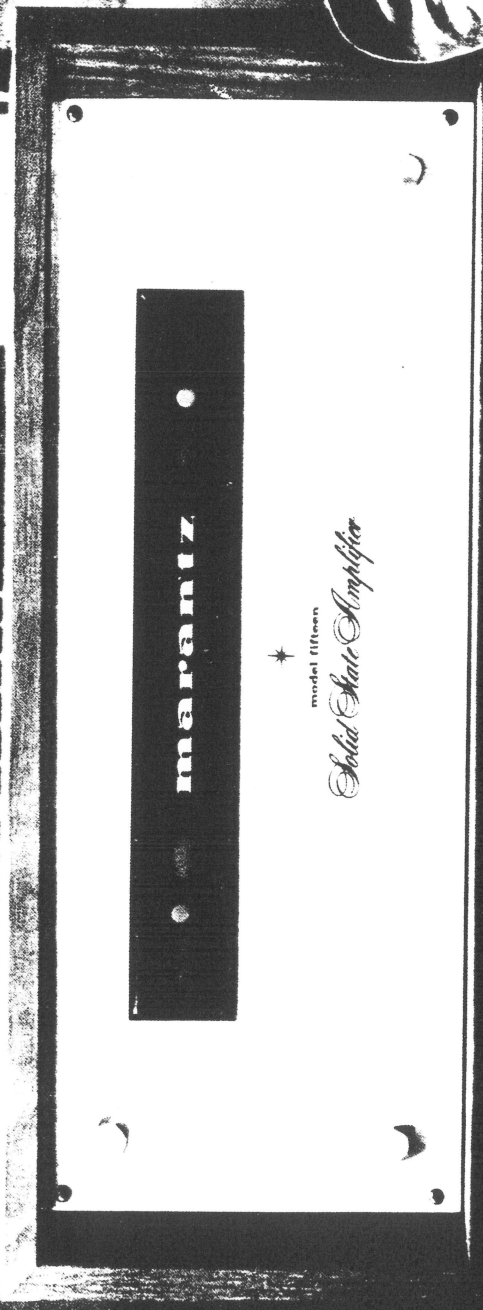


H A N D B O O K O F I N S T R U C T I O N S



marantz

model fifteen  
*Solid State Amplifier*

marantz

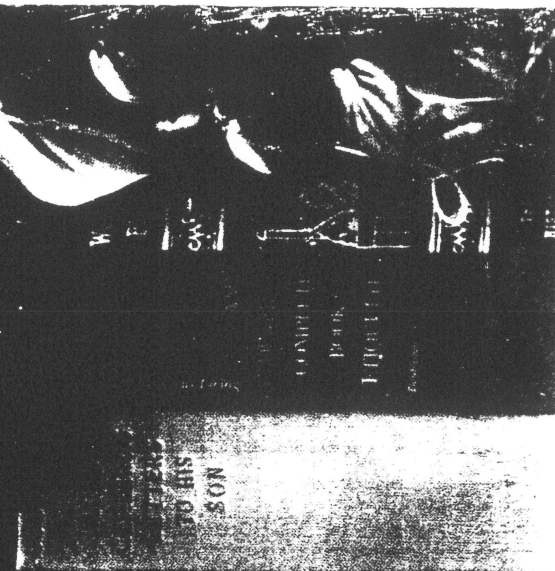
This is  
AVBE



model fifteen

*Solid State Amplifier*

Patented  
Made  
in  
America  
Thought



## FOREWORD

### **AFTER UNPACKING**

It will be to your advantage to save all the packing materials—carton, fillers, cushioning, etc. They will prove valuable in preventing damage should you ever have occasion to transport or ship your amplifier. Be careful that you do not inadvertently throw away or lose the small envelope containing mounting hardware for custom installations.

Please inspect your amplifier carefully for any signs of damage incurred in transit. It has undergone very strict quality-control inspections and tests prior to packing. Thus, it left the factory unmarred, and in perfect operating condition. If you should discover damage, notify the transportation company without delay. Only you, the consignee,

may institute a claim with the carrier for damage during shipment. However, the Marantz Company will cooperate fully with you in such an event. Save the carton as evidence of damage for their inspection.

### **WARRANTY**

To qualify for the Marantz 3-Year Golden Warranty, please fill out the warranty registration card and mail it to the factory promptly. Your dealer has officially reported your ownership of this amplifier and date of delivery to you, but your warranty protection will not go into effect unless you promptly return the registration card, which is packed within the carton.

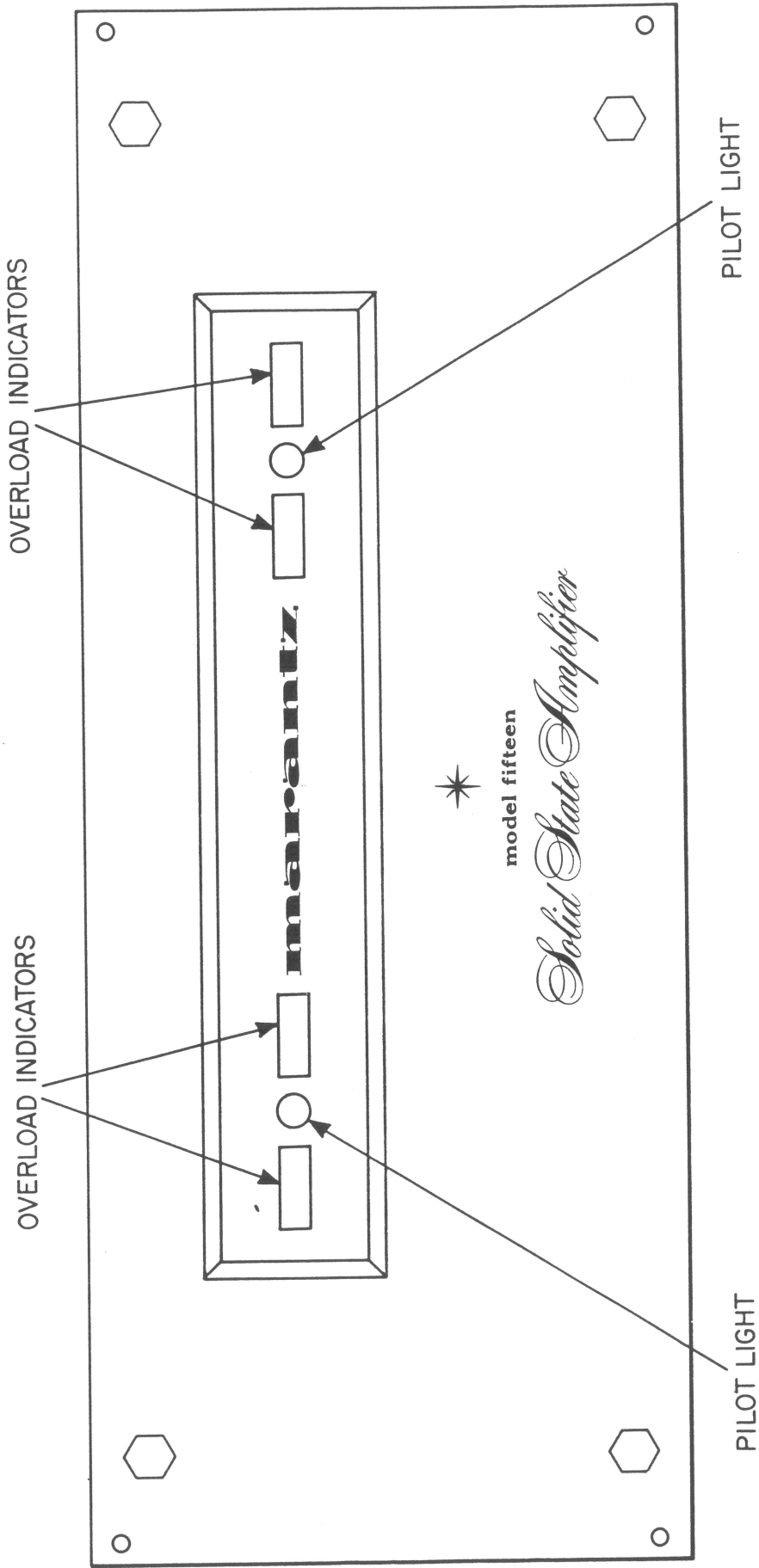


Figure 1. Model Fifteen, Front Panel

## GENERAL DESCRIPTION

The model 15 consists of two completely separate and electrically isolated power amplifier modules bolted together and attached to a common front panel. Each power amplifier module contains its own power supply, line cord, fuse, pilot light, input jack, and output terminals. There are no operating controls or adjustments on the model 15.

This new Marantz-developed, direct-coupled amplifier design features complementary-symmetry silicon transistor circuitry. It achieves the finest technical performance, coupled with an unprecedented order of reliability. A unique and effective safety circuit, together with conservative operational ratings, assures full protection against unexpected damage to output and driver transistors resulting from output short circuits, open circuits, overdriving, capacitive loads, or any type of complex reactive loudspeaker loading. Accidental open or short circuiting, even with continuous full-power 20,000 Hz output is completely safe. This instantaneous-acting, current-limiting safety circuit gives constant and unobtrusive pro-

tection without causing annoying program interruptions. You don't have to wait for the transistors to "cool off", since the safety circuit never permits them to reach this dangerous state. When a short circuit, open circuit, or grossly overloading input signal condition ceases, the amplifier instantly resumes normal operation. In addition, an electronic time-delay circuit protects loudspeakers from damage by power turn-on and turn-off pulses and surges.

The front panel (Figure 1) contains two groups of 3 indicators, one for each channel. In each group, the center green indicator is the pilot light. Flanking each pilot light are two red indicators which are activated by the automatic safety circuit. In the event of a severe overload (excessive output current) the indicators will light brightly. Under normal operating conditions, the indicators may glow slightly during very loud passages, particularly with 4-ohm loudspeakers (but without any increase in distortion) since such loads draw more current through the output circuit. Therefore, they are less likely to do

so with higher impedance loads.

The sharp "crossover notch" characteristic of other output circuits has been virtually eliminated in the model 15, resulting in typical full-power distortion below the residual distortion of most test instruments. The result is unequalled cleanliness of reproduction. The model 15 performs flawlessly with any loudspeaker—be it a 4-ohm acoustic suspension type, or a 16-ohm electrostatic.

Stability, overload recovery, and transient response are all superb. Square waves are exceptionally clean, having a fast rise-time with no observable overshoot or ringing. Safe ratings and massive "heat sinks" contribute to the exceptionally cool operation of this amplifier.

The performance of the model 15 not only exceeds that of the best vacuum-tube designs, but should establish wholly new standards of technical excellence for amplifiers of all types.

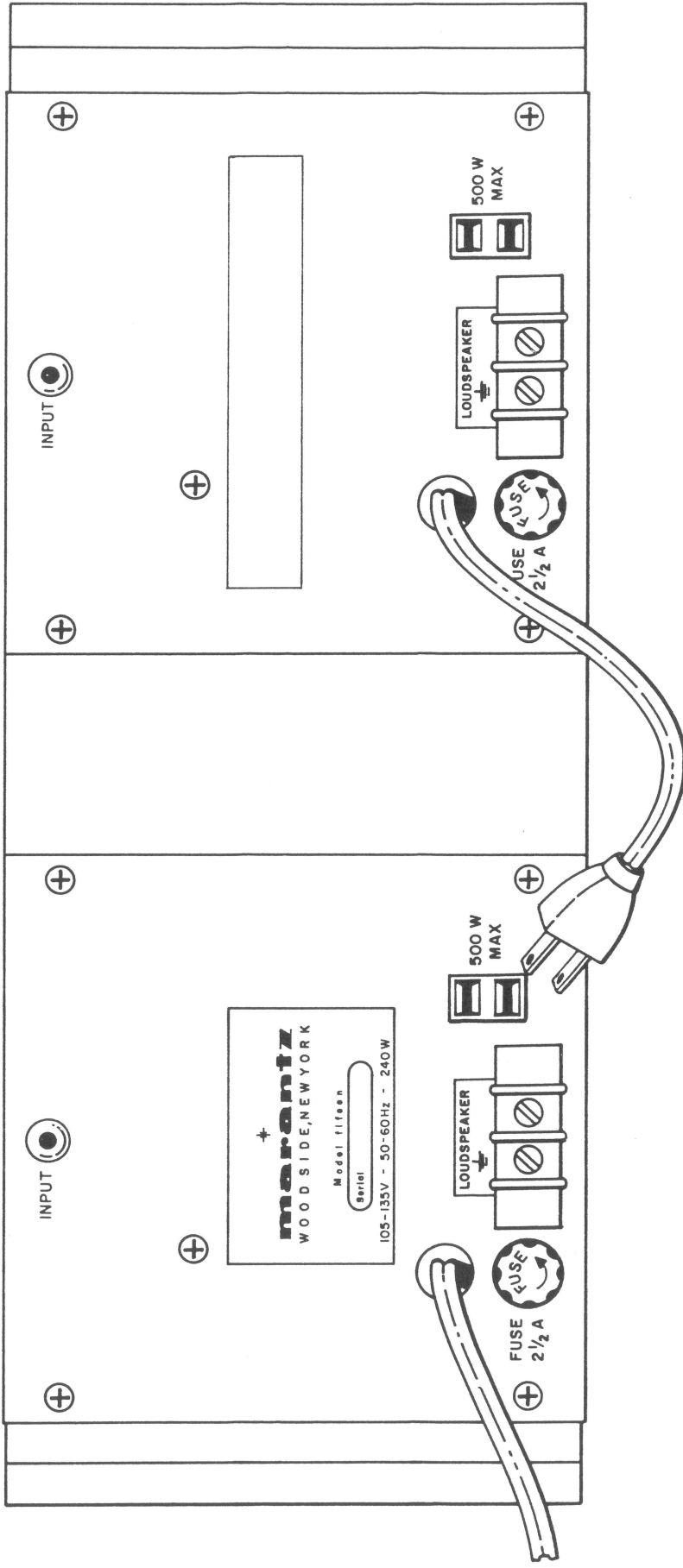


Figure 2. Model Fifteen, Rear View

# INSTALLATION

## CONNECTION FACILITIES

Input and output connection facilities are located on the rear panel of each amplifier channel or module, as shown in Figure 2. The two INPUT jacks at the top of the rear panel should be connected to the two output channels of a preamplifier, or other audio component, with the shielded audio cables supplied with preamplifiers for this purpose. Where longer lengths are needed, suitable standard cables are sold by all dealers. Approximately 1 volt of input signal is required to drive the amplifier to full rated output power. Input load impedance is 100,000 ohms.

The LOUDSPEAKER terminals at the bottom of the module can be connected to any loudspeaker system having a rated impedance between 4 and 16 ohms. On each module, the gray-coded terminal is the common or electrical ground; the red-coded terminal is the "hot" terminal. Be careful in connecting the model 15 to a loudspeaker system which contains a built-in power supply—such as an electrostatic loudspeaker. The "common" speaker-connection terminal of these devices may be capacitively grounded through the power supply. Make sure the gray-coded terminal of the model 15 is connected to the "common" terminal of the loudspeaker system.

Ordinary #18-gauge, two-conductor lamp cord ("zipcord") may be used for normal distances (to about 30 feet) between the amplifier and the loudspeaker. For longer lengths use #16-gauge wire or heavier, depending on distance.

In connecting two loudspeaker systems for stereo operation, it is important to insure correct relative phasing (polarity). This is best achieved, when using identical loudspeaker systems, by simply coding each wire for identification. One wire in each pair should be coded at both ends with a knot, tape, etc. The coded wires can then be used for identical connections in each channel. For example, the coded wire in each pair can be connected to the "common" terminal of each loudspeaker system and the gray-coded terminal of each amplifier channel. The uncoded wire of each pair is then connected between the remaining ("4", "8", or "16" ohm) loudspeaker terminal and the red-coded terminal of each module. This procedure insures correct polarity or phasing of identical loudspeaker systems.

## NOTE

Close inspection of standard zipcord will reveal some form of coding on the insulation (ridge or groove on one edge) or one of the wires may be tinned and the other wire not tinned.

If there is any doubt about the phasing of your loudspeaker systems for stereo operation, particularly if they are not identical, a simple listening test can be performed to verify correct phasing. With program signals fed to both input channels of the preamplifier, and the "mode" switch set to "mono", the sound should appear to originate at a point midway between the loudspeakers, when the "balance" control is centered. As the "balance" control is turned away from the center position, the sound source should appear to move toward one of the two loudspeaker systems.

In some situations, undesirable "room acoustics" can make the results of this test ambiguous or confusing. To check phasing of your loudspeaker systems under such difficult circumstances, move them temporarily as close together as possible, and, with the pre-amplifier controls set for balanced "mono" operation, listen to program material which contains strong bass passages. Reverse the wires to one of the loudspeaker systems and listen to the same passages again. If there is noticeably less bass with the reversed-wires connection, change the wire connections back to the original arrangement. If there is noticeably more bass, leave the wires connected in reverse.

## POWER CONNECTIONS

Each amplifier module has its own power cord and a convenience outlet. For normal usage, plug the short power cord of one module into the convenience outlet on the other module, and plug the long power cord into one of the convenience outlets on the preamplifier. With this arrangement, both channels of the model 15 will be controlled by the "ON-OFF" switch on the preamplifier.

## NOTE

When your amplifier's performance was measured at the factory, prior to packing, the plug on the short power cord was inserted in the position (polarity) which yielded the lowest measurable hum. If you have occasion to disconnect this plug, we suggest that you first mark one side of it for reference. Thereafter, you can always reconnect the plug for the same optimum performance.

# OPERATION

After installing the model 15, and after loudspeaker connections have been made or are altered, observe the red indicators on the front panel when power is turned on and program signals are applied to the INPUT jacks. If there is a short circuit in your wiring connections to the loudspeakers, you will notice that the indicators glow with increasing intensity as you increase the level of the input signals. To avoid loud "blasts" from your loudspeakers, turn down the input signal levels before correcting the short circuit condition. Remember that the model 15 will resume normal operation instantly as the short circuit is removed. The indicators will not glow if there is an open circuit condition in the output wiring. You will also note that the amplifier begins to operate approximately 5 seconds after power is first turned on. This is normal. The built-in time-delay circuit protects your loudspeakers from damage by the power turn-on pulses or surges common with solid-state components.

## PARALLEL OPERATION

Since the model 15 does not employ output transformers, parallel-connected operation will not provide the significant increase in power output obtainable from tube-type circuits. This effect is particularly noticeable with 8 or 16-ohm loudspeaker loads. With 4-ohm loads, however, substantially more power can be obtained, using the circuit connection shown in Figure 3.

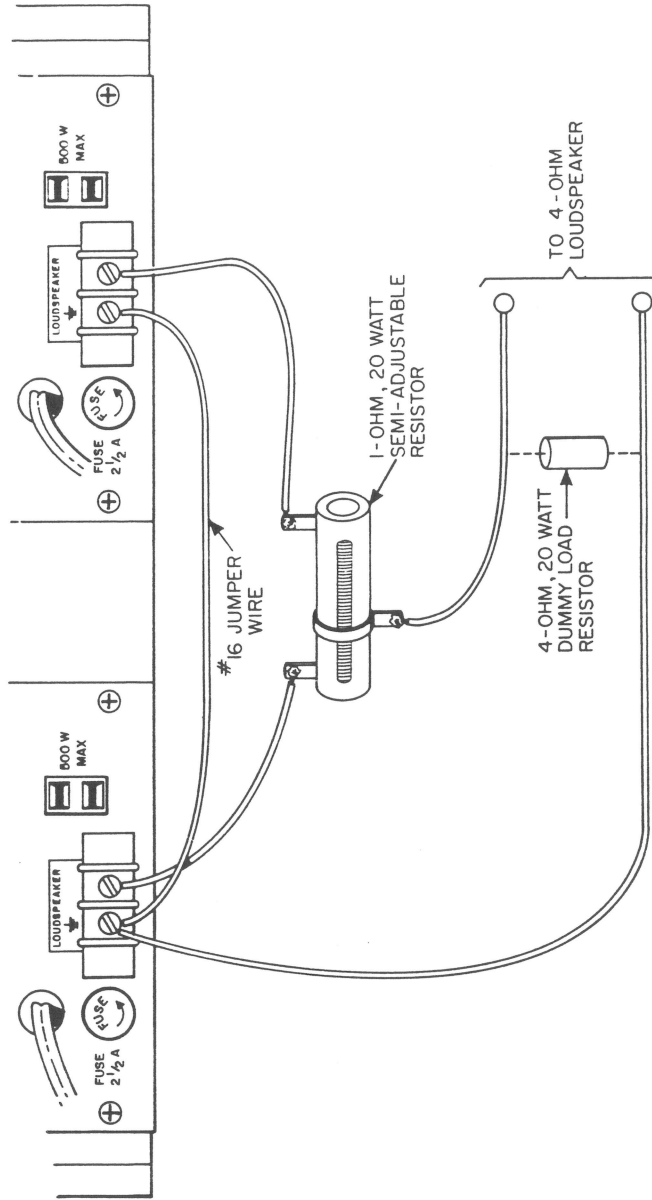


Figure 3. Parallel-Connected Operation with 4-ohm Load

### CAUTION

Never connect the loudspeaker terminals of one amplifier module directly to those of the other module, or to any other amplifier. Any resulting damage to the model 15 is not covered under the terms of the warranty.

Before making the connections, check the d-c balance of each amplifier module, using a DC VTVM, as follows:

Step 1. Set the VTVM for +d-c measurement on its most sensitive scale.

- Step 2. Turn off input signal to the amplifier module.
- Step 3. Disconnect wiring from the LOUDSPEAKER terminals and turn on amplifier module.
- Step 4. After the VTVM has warmed up and stabilized, short its test leads together and offset the zero to a convenient reference mark near the center of the scale.
- Step 5. Observe whether or not there is a significant difference (5 millivolts or more) in meter indication with the test leads shorted together or connected to the LOUDSPEAKER terminals.
- Step 6. If a significant difference of indications is observed, remove the access cover screw (See Figure 4.) and adjust the potentiometer inside the module, using a small, narrow-blade screwdriver. Adjust carefully, while observing the output voltage indication, until there is no discernible difference between the two indications described in Step 5.
- Step 3. Connect the input signal to both INPUT jacks on the rear panel via a "Y" connection, or via two identical cables (taped or laced together) from the bridged preamplifier outputs.
- Step 4. Apply a test signal from an audio generator and increase the amplitude until the red indicators on the front panel begin to glow dimly.
- Step 5. Reset the tap of the adjustable resistor, if necessary, for equal illumination between both pairs of red indicators.
- Step 6. Disconnect the 4-ohm dummy load resistor, and connect the network to the 4-ohm loudspeaker.

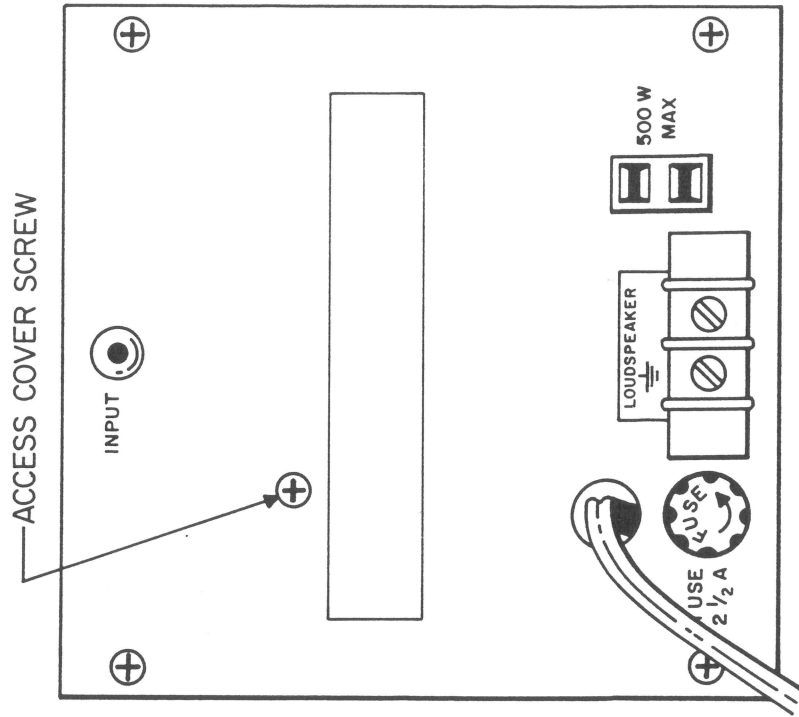


Figure 4. Location of D-C Balance Adjustment

- After the d-c balance of each amplifier module has been checked, and adjusted, if necessary, proceed as follows:
- Step 1. Set the adjustable tap of the 1-ohm, 20-watt resistor to a position midway between its end terminals.
- Step 2. Connect the adjustable resistor, the 4-ohm dummy load resistor, and the jumper wire to the LOUDSPEAKER terminals of both amplifier modules, as shown in Figure 3.

## CUSTOM INSTALLATION

Since there are no operating controls on the model 15, it may be installed in any location where adequate ventilation can be assured. If you prefer to install the amplifier in a furniture cabinet, use the Cabinet Mounting Template as a guide. Complete instructions for making this type of custom installation are printed on the template. The necessary hardware is packed in the accessory kit envelope.

## SERVICE NOTES

Since the model 15 amplifier is a completely solid-state device, replacement of parts should normally never be required. If one of the pilot lights should burn out, however, you can replace it as follows:

- Step 1. The black name-plate bar is secured to the front panel by spring clips. Pull the bar away from the panel just far enough so you can discon-

nect the small socket from the rear of the lamp.

- Step 2. Remove the spring clip from the lamp body by squeezing its tabs together with a pair of needle-nose pliers, then push the lamp through the black bar from rear to front.

- Step 3. Replace the lamp with a new one, Part Number LC507, available from Marantz dealers or authorized warranty stations.

## FUSES

Each amplifier module of the model 15 is protected by a 2½-amp fuse. In the event a fuse blows out, replace **ONLY** with the same type and rating. Replacement with a fuse of higher rating will not protect the instrument and will void the warranty.

## CLEANING

Your model 15 amplifier has a very durable finish. The aluminum front panel and name-

plate bar are anodized for lasting beauty. You can clean the panel and bar with a soft, lint-free cloth slightly dampened with a mild detergent and water solution. **Never** use scouring powder, lye solution, or any strong abrasive cleaner. These will mar the finish.

## REPAIRS

Only the most competent and qualified service technicians should be allowed to service the model 15. The Marantz Company and its factory-trained warranty station personnel have the knowledge and special equipment needed for repair and calibration of this precision instrument.

In the event of difficulty, write directly to the factory for the name and address of the Marantz warranty or authorized service station nearest your home or business. Please include the model and serial number of your unit together with a full description of what you feel is abnormal in its behavior.

## TECHNICAL SPECIFICATIONS

Input Signal for Rated Power Output .....	1 volt rms
Input Impedance .....	100,000 ohms
Frequency Response .....	Within 1 dB, 10 to 60,000 Hz.
Power Output (each channel) .....	70 watts rms @ 4 ohms load 60 watts rms @ 8 ohms load 40 watts rms @ 16 ohms load
Damping Factor .....	Greater than 150 with 8-ohm load
Overload Recovery .....	Instantaneous
Total Harmonic Distortion .....	Less than 0.1%—typically 0.03% with 8-ohm or higher load—at full rated output, at any frequency from 20 to 20,000 Hz. Distortion decreases as output level is lowered.
Total Noise .....	Better than 90 dB below 60 watts into 8 ohms.
Power Requirements .....	105 to 135 volts 50 to 60 Hz. 240 watts
Dimensions .....	15 <sup>3</sup> / <sub>8</sub> inches wide 5 <sup>3</sup> / <sub>4</sub> inches high 8 inches deep
Weight .....	model 15 alone, 30 pounds; packed in shipping carton, 34 pounds

Specifications subject to change without notice.



# **INSPECTION**

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A SUBSIDIARY OF SUPERSCOPE, INCORPORATED