

# marantz

model 9

## Power Amplifier

### INSTRUCTION MANUAL

The model 9 is a single-channel 70 watt amplifier with highly professional performance characteristics. The precision and ruggedness of its internal and external construction speaks for itself — it is of a quality which will assure its owner the utmost in reliability. Two model 9 amplifiers will provide the very finest stereophonic performance.

#### WARRANTY:

Return the enclosed registration card promptly to assure protection under our TWO YEAR WARRANTY.

#### PRELIMINARY

#### LINE REQUIREMENTS:

Design Center: 117 volts, 60 cycles; 190-250 W  
Range: 105-125 volts, 50-60 cycles

#### TUBE INSTALLATION:

(Use a towel or pad in inserting tubes. This will minimize the possibility of injury if a tube should break.)

After thorough testing and adjustments were completed on this amplifier, each tube was coded with its socket number, removed, and packed separately under the perforated grille. In order to obtain the same performance shown by the test card, be sure that the tube code numbers correspond with the socket numbers into which they are inserted. The grille can be lifted off after the removal of the six screws holding it in place. To replace meter illumination bulb, remove the rear meter cover (held in place with the large thumbscrew located between two transformers). The light socket will slide off its bracket for replacement with a new #47 bulb.

#### VENTILATION:

The model 9 is remarkably cool in normal operation. However, any amplifier will become hot if its heat is not allowed to freely dissipate itself into the surrounding air. It should be installed so as to allow unrestricted airspace or ventilation all around. If necessary to mount in a small cabinet chamber, a cooling flow of air can be provided by drilling a generous number of  $\frac{3}{4}$ " to 1" holes in the bottom shelf, and also along the upper edge of the enclosure's rear panel. This allows warmed air to rise and flow out of the chamber, drawing in cooler air through the bottom holes.

#### LOCATION OF FACILITIES:

All controls, adjustments, connections, etc., (with the exception of the Triode switch) are located on the front panel. Input and Output connections, as well as Bias Adjustments will be found under the snap-out access-door. This is easily removed by placing your fingers under each tapered end of the black nameplate bar and pulling outward.

The Triode switch is located under the perforated grille near the rear edge of the chassis. This switch changes the output tubes to operate as triodes and will produce nearly 40 watts in this mode with excellent characteristics.

#### CONTROLS, ETC.

**GAIN**— (Isolated by phase inverter-cathode follower input circuit) The gain control on the model 9 is unique in that it has absolutely no effect on circuit stability or distortion!

**PHASE**— For reversing phase of the input signal. (see "Phantom Center-Channel Speaker")

**LOW FILTER**—Sharply reduces signals in *sub-audible* frequency range, thereby preventing transformer-iron saturation (and consequent distortion) caused by changing line surges in preamplifier, turntable rumble, etc. Its effect at 20 cycles is a drop of less than  $\frac{1}{4}$  db, but attenuates 20 db at 3 cycles. Use of this filter is recommended for normal listening.

**FUSE**— 3 Amperes, slow-blow

**POWER**—6 Ampere A.C. line switch.

**TEST**— This switch is used in conjunction with the panel meter and five bias and balance screwdriver adjustments located under the access-door. Together, they comprise a built-in self-testing and adjustment instrument for continuing optimum performance.

Under Access-Door: INPUT CONNECTOR; OUTPUT TERMINAL BLOCK; 4 BIAS AND 1 BALANCE SCREWDRIVER ADJUSTMENTS

## INSTALLATION

### INPUT CONNECTIONS:

A standard audio cable is provided for connection from a preamplifier or other component which can provide  $1\frac{1}{4}$  volts of undistorted signal. The cable should be plugged into the jack marked "INPUT" located under the access-door. For neatness it can be dressed under the amplifier and led out the rear.

### OUTPUT (LOUDSPEAKER) CONNECTIONS:

The "OUTPUT" connector block provides a "COMMON" (ground) terminal and output impedances of 1, 4, 8 and 16 ohms. The 1 ohm tap is not rated to fulfill all our specifications if used by itself, but is included for possible use with phantom center-channel speakers for stereo installations, or for additional remote monophonic speakers in other rooms.

Ordinary 18 gauge two-conductor lamp wire (zipcord) may be used for normal distances (to about 30 feet) to a loudspeaker. With more remote distances use 16 gauge wire, or heavier, depending on distance.

To connect the speaker, attach one wire to the tap marked "COM", and the other to the impedance tap specified for the loudspeaker. The opposite two ends connect to the loudspeaker terminals.

In connecting two amplifiers for stereo it is important to insure correct relative phasing (polarity) of the speakers. This can be simplified by coding each wire for identification. One lead in each pair can be coded at both ends with a knot, tape, etc. The coded wires can then be used for identical connections in each channel. As an example, the coded wires may be used for connection between the "COMMON" terminals of each speaker and its amplifier. The uncoded wires may then be connected between each remaining speaker terminal and the recommended impedance tap on its amplifier. This procedure insures correct phasing where speakers and amplifiers are identical.

## OPERATION

### PRELIMINARY:

- 1 — Turn amplifier "GAIN" Control to minimum (counter clockwise).  
(This is only temporary, and must later be turned up clockwise for operation).
- 2 — Turn "TEST" Switch to "Operate"
- 3 — Turn AC Power Switch to "ON" (Meter should light).

After the amplifier has "warmed up" for about 30 seconds, the following check should be made to confirm that the output tubes were not damaged in shipment, or that tubes are fully seated in their sockets:

- 1 — Turn the TEST switch successively through the positions marked "V8", "V7", "V6", and "V5". The meter pointer should, in each case, indicate in the vicinity of the "BIAS" mark. (At this point, amplifier is still "cold" and readings will not be accurate). If one of the positions gives no reading or indicates completely off the meter, it is an indication that, either: the tube has become defective in shipment, or; it has not been fully seated in its socket.

NOTE: Turn the amplifier off before attempting to reseat a tube. Also, wait for tubes to cool before handling. In either case above, the amplifier should be turned off until the trouble has been corrected.

- 2 — If the above test indicates satisfactorily, turn the TEST SWITCH clockwise to the "AC Balance" position, holding it in this position for 5 to 10 seconds. The pointer should settle close to the "BALANCE" point on the meter. If the pointer goes off the scale in either direction, it indicates that tube V3 (6DJ8/ECC-88) has been damaged, is not fully seated in its socket, or that AC Balance adjustment is required (see step 5 in "TESTS AND ADJUSTMENTS" section below).
- 3 — The TEST switch may be returned to "Operate" position, and the GAIN turned up full (clockwise). The amplifier is now ready to use. The amplifier need be rechecked only occasionally . . . perhaps every few weeks or so.

After the amplifier has been on, or in operation for a half hour or so, a final test and/or adjustment should be made. A screwdriver which will fit into the Bias adjustment holes (under the access-door) will be needed for this operation. The Bias has been correctly adjusted for 117 volts A.C. If the A.C. line voltage is higher or lower this will show on the meter as a reading correspondingly higher or lower. In other words, this reading will normally vary with line voltage changes. It is desirable, therefore, that bias be adjusted so that the readings will not vary much beyond the "BIAS" point when the A.C. line voltage is at its highest.

### TESTS AND ADJUSTMENTS:

NOTE THAT GAIN SHOULD ALWAYS BE TURNED DOWN BEFORE MAKING TESTS

- 1 — Turn TEST Switch to "V8". Turn screw driver adjustment marked "V8", if necessary, until pointer gives meter reading on "BIAS" mark. (This corresponds to a cathode current of 55 milliamperes through V8.)
- 2 — Repeat the above steps successively through "V7", "V6", and "V5" making adjustments for each where required.

- 3 — Since the adjustments are somewhat interacting, repeat steps 1 and 2 for final touch-up adjustments before proceeding.
- 4 — Turn TEST switch to "DC Balance". Note the pointer's position in relation to the "Balance" mark on the meter. Normally it will indicate within 1/16" of either side of the mark.
- 5 — Turn TEST switch to "AC Balance". Within a few seconds the pointer should settle to the SAME POINT as in "DC Balance" position. If not, turn AC Balance screwdriver adjustment to give the proper reading. The meter pointer will vibrate gently due to the internal test signal, but will not interfere with making a sufficiently accurate adjustment. (Do not hold the switch in AC Balance position for more than about 20 seconds at a time. If further adjustment is required, allow the control to snap back for about 10 seconds before repeating).
- 6 — Return TEST switch to "Operate" and GAIN control to maximum (clockwise) in order to use the amplifier.

### PHANTOM CENTER-CHANNEL SPEAKER:

The unique input phasing circuit makes it possible to connect a center speaker between two stereo-connected model 9 amplifiers. Ordinarily, this type of connection gives an incorrect A minus B resultant, but by throwing the PHASE switch in one channel to "Reverse", an A plus B resultant is accomplished. In doing so, the side stereo speaker in that channel has also been reversed in phase, and it is now necessary to correct this by reversing the polarity of its leads.

- 1 — Connect the center speaker terminals to identical output taps on each amplifier. It is preferable that a tap be used that is two steps below the rated speaker impedance. For example, connect a 16 ohm speaker to both 4 ohm taps.
- 2 — Connect a short heavy wire (16 gauge) to both COMMON taps, keeping the two amplifiers as close together as possible.
- 3 — Reverse the PHASE switch and also the lead polarity of the side speaker on ONE amplifier only.
- 4 — This phantom center-channel connection may also be used for a remote speaker in another room.

### INSTALLATION OF OTHER DAMPING FACTORS:

Although it is felt most loudspeakers will deliver their best performance with a very high damping factor, some speaker manufacturers seem to feel that under certain conditions their speakers will operate better with lower damping factors. If the owner has any questions about this, he should consult speaker specifications.

By removal of the two jumper wires on the main terminal board (which can be located by tracing the circuit to "RA" and "RB") and replacing them with resistors listed below, damping factors of approximately 2, 1, or 1/2 are obtainable at the corresponding output terminal.

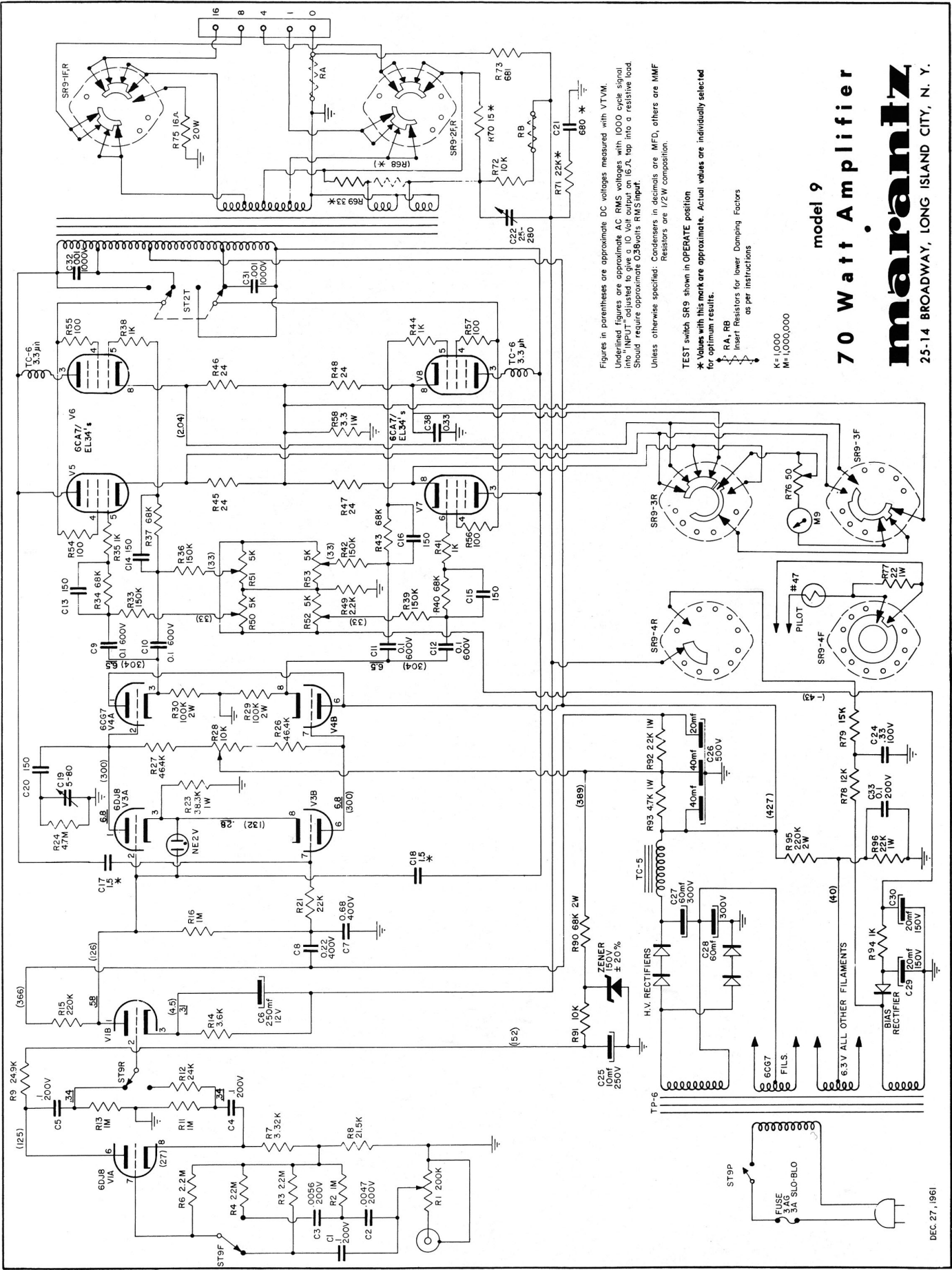
The resistor connected as "RA" is a parallel combination (total value in parentheses) of IRC BW 1/2W or 1W wire-wound resistors carried by many jobbers. If substitution is made, total watt dissipation should be at least equivalent. The resistor connected as "RB" should be 1 watt carbon composition. Tolerance on these parts should be 10% or better.

#### FOR APPROXIMATE DAMPING FACTOR OF:

		2	1	1/2
FOR 16 OHM LOADS	RA	2-0.33Ω 1/2W (0.165Ω)	2-0.47 1/2W (0.235Ω)	2-0.68Ω 1W (0.34Ω)
	RB	10K	22K	39K
FOR 8 OHM LOADS	RA	2-0.47Ω 1/2W (0.235Ω)	2-0.33Ω 1W (0.165Ω)	2-0.47Ω 1W (0.235Ω)
	RB	10K	22K	39K
FOR 4 OHM LOADS	RA	3-0.24Ω 1/2W (0.08Ω)	2-0.24Ω 1W (0.12Ω)	3-0.47Ω 1W (0.157Ω)
	RB	10K	22K	39K

### REPLACEMENT PARTS:

Requests for replacement parts should be accompanied where possible with the *part number* shown on diagram, together with the *serial number* of the unit for which replacement is intended.



Figures in parentheses are approximate DC voltages measured with VTVM.  
 Underlined figures are approximate AC RMS voltages with 1000 cycle signal.  
 into "INPUT" adjusted to give a 10 volt output on 16.7A tap into a resistive load.  
 Should require approximate 0.35volts RMS input.  
 Unless otherwise specified: Condensers in decimals are MFD, others are MMF  
 Resistors are 1/2W composition.

TEST switch SR9 shown in OPERATE position  
 \*Values with this mark are approximate. Actual values are individually selected for optimum results.

†Insert Resistors for lower Damping Factors as per instructions

K=1,000  
 M=1,000,000

# 70 Watt Amplifier

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25-14 BROADWAY, LONG ISLAND CITY, N. Y.