

service
manual

8B

marantz

model 8B stereophonic

Power Amplifier

INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service data for the Marantz Model 8B Stereophonic Power Amplifier.

Adjustment information and voltage and resistance data included in this manual are intended for use by the knowledgeable and experienced technician only. All instructions should be read carefully. No attempt should be made to proceed without a good understanding of amplifier operation. The functional description and associated block diagram furnishes signal flow and functional data about the amplifier, provided as an aid in this understanding.

The parts list furnishes information by which replacement parts may be ordered from the Marantz Company. A description is included for parts which can usually be obtained through local suppliers.

FUNCTIONAL DESCRIPTION

Figure 1 is a simplified block diagram of the Model 8B Stereo Power Amplifier, showing its functional elements and the signal flow within the amplifier. The unit consists of two identical channels, a common test meter circuit, and a common power supply. For clarity, only channel A and the common circuits are shown.

The audio signal at INPUT A is applied through the low-frequency RC filter to pre-driver V1. The low-frequency filter consists of a dual-section RC network which attenuates frequencies below 20 Hz. Attenuation approaches a rate of 12 db/octave. This serves to suppress speaker breathing and other sub-sonic disturbances. A 1.3-volt signal at INPUT A is required to drive the amplifier to its full output. The TEST A input bypasses the low-frequency filter, thus enabling low-frequency response to be carried out to below 2 Hz without attenuation. This facility is provided for production testing of the power amplifier and is otherwise not used.

The pre-driver is a voltage amplifier consisting of a triode-connected pentode, with overall negative (degenerative) feedback coupled to its cathode from the output circuits. The network consisting of C4 and R3 comprise an RFI rejection filter which minimizes the possibility of interference from nearby transmitters. The output of the pre-driver is direct-coupled to driver-inverter V2.

The driver-inverter consists of a dual triode connected in what is commonly known as a "long tail pair" configuration. The driver section is a triode voltage amplifier with its cathode resistor (R8) common to the inverter section. The driver provides a voltage gain of approximately 2, and drives output stage V4. The inverter section is also a triode, but it is connected in a grounded-grid configuration. The input signal source is the common cathode resistor (R8) of the driver section. Because of the grounded-grid connection, the outputs of the driver and inverter sections are 180 degrees out-of-phase with each other, providing the required push-pull drive signal. The inverted output drives output stage V3. The relative amplitude of the driver and inverter outputs is adjustable with AC BALANCE potentiometer R11, which compensates by adjusting V2 loads. C14 is a VHF roll-off capacitor, which reduces the gain of the driver-inverter at frequencies well beyond the audio range. Negative feedback is applied to both the driver and inverter inputs (criss-crossed C9 and C10) from the output of the power amplifiers. This feedback serves to eliminate parasitic oscillations.

Signals from driver-inverter V2 are ac coupled to push-pull output stages V3 and V4. These are fixed bias, ultra linear amplifiers operating class A. Since they do not require any appreciable driving power (do not draw grid current) they constitute the power amplifier section of the unit. Each output stage has an individual dc BIAS potentiometer (R14 and R15) for adjusting the quiescent cathode currents. As mentioned above, feedback from the outputs of V3 and V4 is applied to the driver-inverter to prevent parasitic oscillations.

The cathode current (combined plate and screen currents) of each output stage is monitored with the built-in test meter and switch. This facility is used for checking the operation of the amplifier, or in conjunction with the AC BALANCE or BIAS potentiometer, to set up the operating conditions. The switch connects the meter in series with the B+ supply, so that V3 or V4 cathode current can be monitored when one of the above adjustments is made.

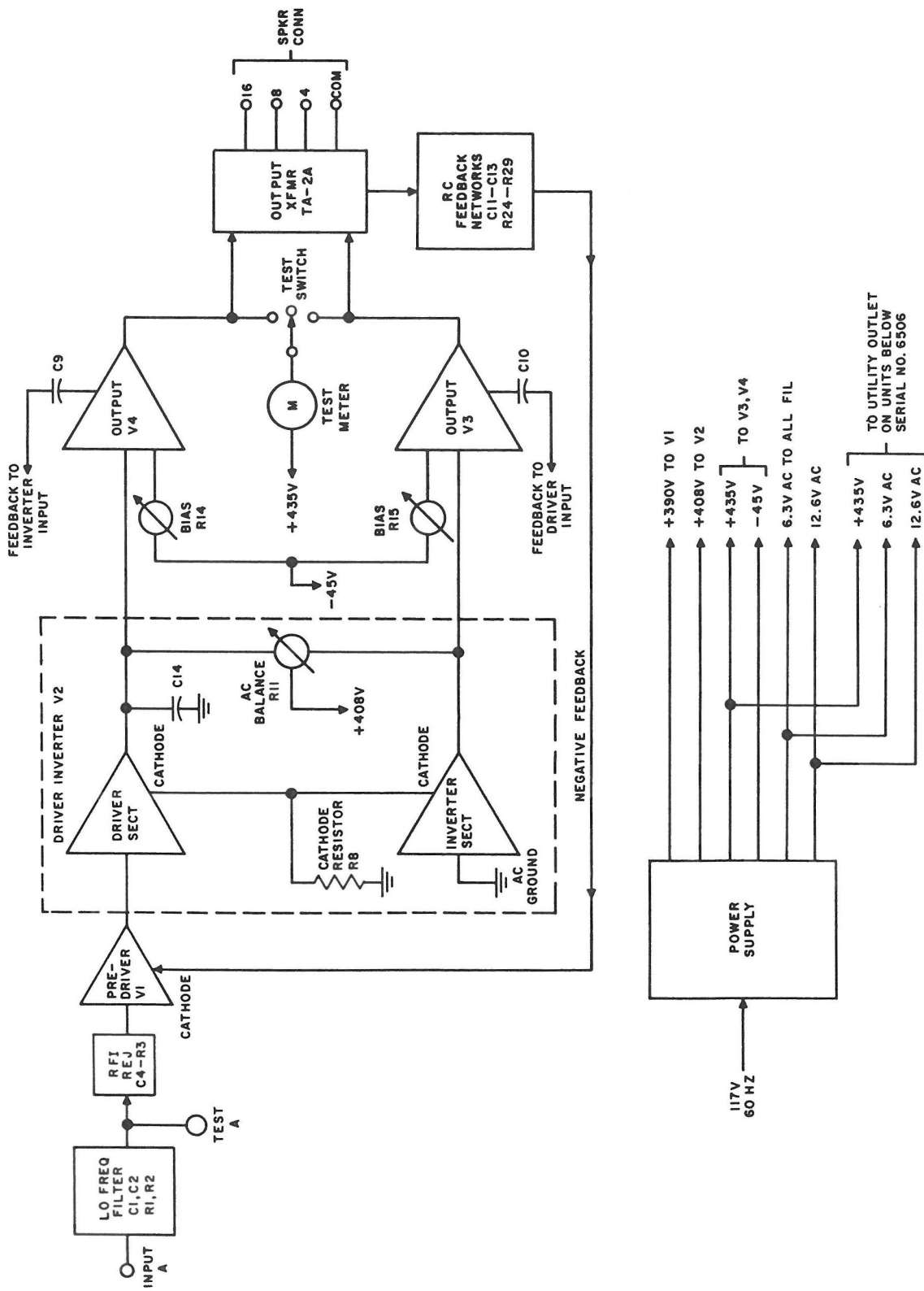


FIGURE 1. MODEL 8B STEREO POWER AMPLIFIER, FUNCTIONAL BLOCK DIAGRAM

The power output stages are transformer-coupled to a 4-, 8-, or 16-ohm speaker by output transformer TA-2. Separate tertiary output windings of the transformer supply negative feedback voltages to pre-driver V1 via RC networks. The values of the resistors and capacitors used in the feedback networks are selected to match the characteristics of the output transformer, and thus obtain optimum high frequency response of the amplifier.

Dc plate potentials for the Model 8B are derived from a full-wave voltage doubler supply. A half-wave rectifier, with capacitor input filter supplies the negative bias for the output stages. On units below serial no. 6506, a UTILITY OUTLET is furnished on the rear apron for powering external equipments.

ADJUSTMENTS

ADJUSTMENT

PROCEDURE

Note

Allow the amplifier to warm up for at least 15 minutes before making any adjustments.

BIAS
(See figure 2.)

1. Remove amplifier inputs.
2. Set the TEST switch to position A1. The meter pointer should deflect to the right.
3. Adjust BIAS A1 potentiometer R15A with a screwdriver so that the meter pointer deflects to the BIAS line. Make this adjustment carefully.

Note

Do not permit the amplifier to operate for long periods with the BIAS adjustment set past the BIAS line as this will decrease tube life.

4. Set the TEST switch to A2 and adjust BIAS A2 potentiometer R14A in the same manner. Be careful to set R14A to the same meter deflection.
5. Repeat the above procedure for channel B, setting the TEST switch to positions B1 and B2, while adjusting channel B BIAS potentiometers R15B and R14B.

AC BALANCE
(See figure 2.)

1. Remove the bottom grille of the amplifier for access to AC BALANCE potentiometers R11A and R11B.
2. Make the BIAS adjustment described above.
3. Disconnect the channel A speaker and connect a 4, 8, or 16 ohm dummy load capable of dissipating 35 watts across appropriate output terminals.

CAUTION

It is preferable to use a dummy load in the above procedure. However, if one is not available, the output terminals may be shorted out from 16 to COM as an alternate method.

ADJUSTMENT

PROCEDURE

4. Connect a 50 to 1000 Hz sine wave that is low in distortion (less than 1%) to the INPUT A terminal of the amplifier. Turn the generator output down all the way.

Note

If the output shorting method is used instead of the dummy load, a very small input signal is required. Also, the signal should be applied for a maximum of 15 seconds at a time during the adjustment. The output tubes in this condition are over-dissipating, and prolonged operation may reduce their life.

5. Set the TEST switch to the A1 position and slowly advance the input signal level until the meter pointer is deflected to the little dot at the far right of the meter face.
6. Set the TEST switch to the A2 position and note the meter deflection. It should be to the same point. If it is not, adjust AC BALANCE potentiometer R11A for the proper deflection. This adjustment will affect the deflection obtained in position A1. The AC BALANCE potentiometer must be readjusted carefully several times switching between the two positions until meter deflection is properly balanced.
7. Remove the dummy load or short circuit from the output transformer and connect it instead to channel B output terminals. Connect the 50 to 1000 Hz signal source to INPUT B and balance channel B. For this, the TEST switch is set to B1 and B2 and AC BALANCE R114B is adjusted.

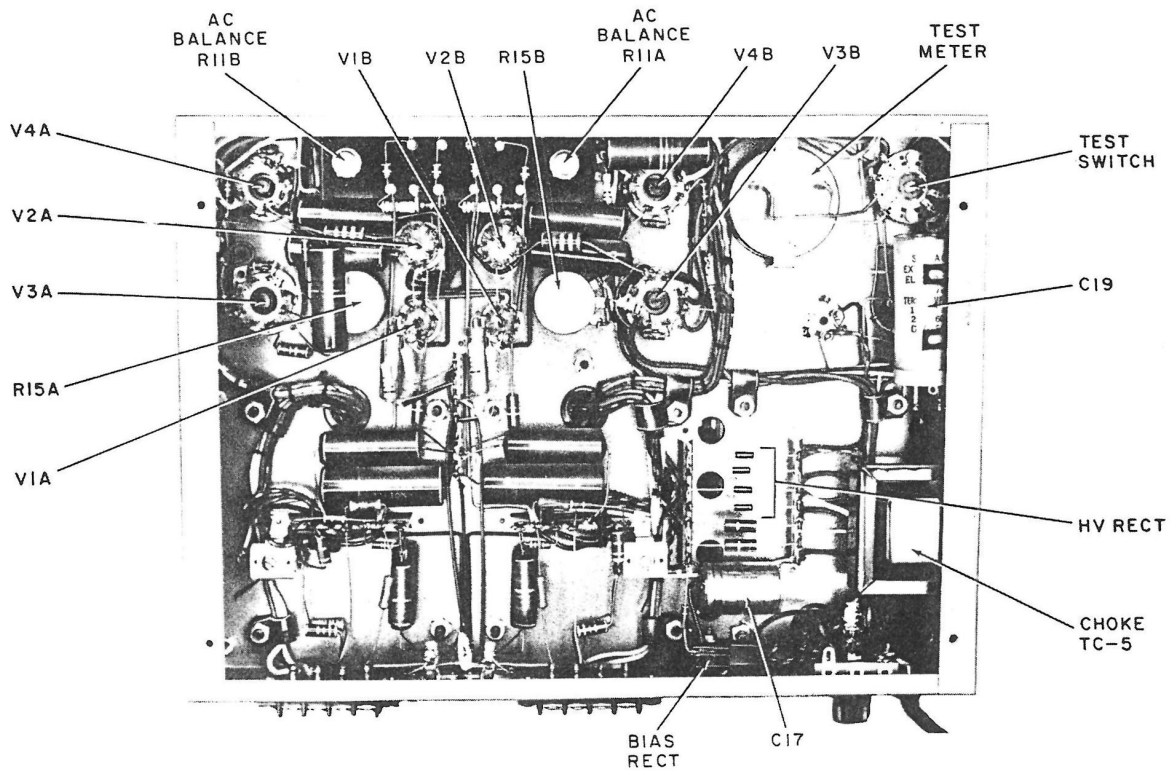
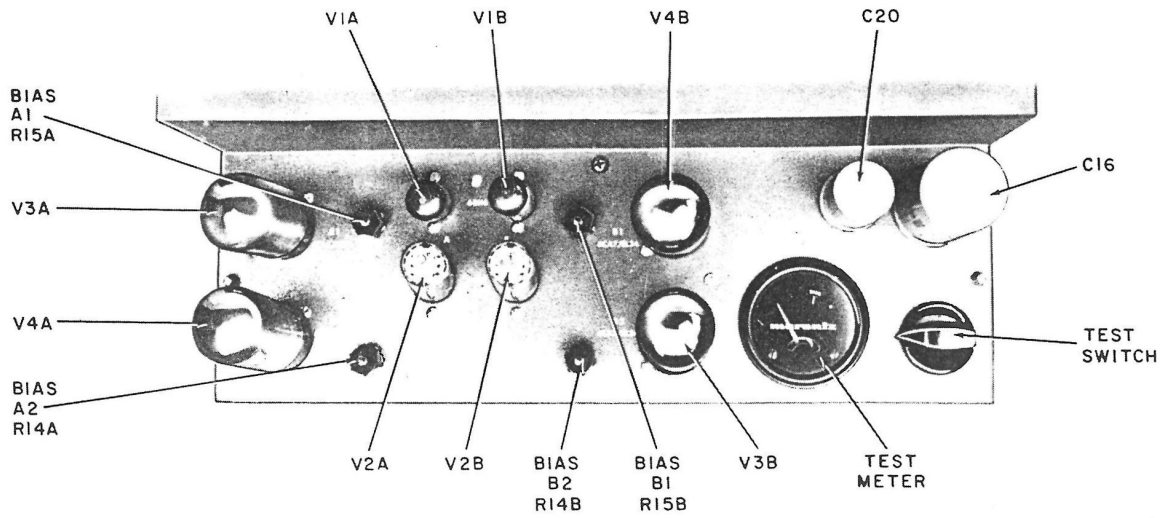


FIGURE 2. ADJUSTMENT AND COMPONENT LOCATIONS

VOLTAGE CHART

TUBE	TYPE	PIN								
		1	2	3	4	5	6	7	8	9
V1A,B	6BH6	0	1.8	FIL	FIL	90	90	90	--	--
V2A,B	6CG7	344	90	100	FIL	FIL	340	90	100	FIL
V3A,B	6CA7/EL34	0	FIL	420	420	-36*	--	FIL	0.68	--
V4A,B	6CA7/EL34	0	FIL	420	420	-36*	--	FIL	0.68	--

NOTES AND CONDITIONS:

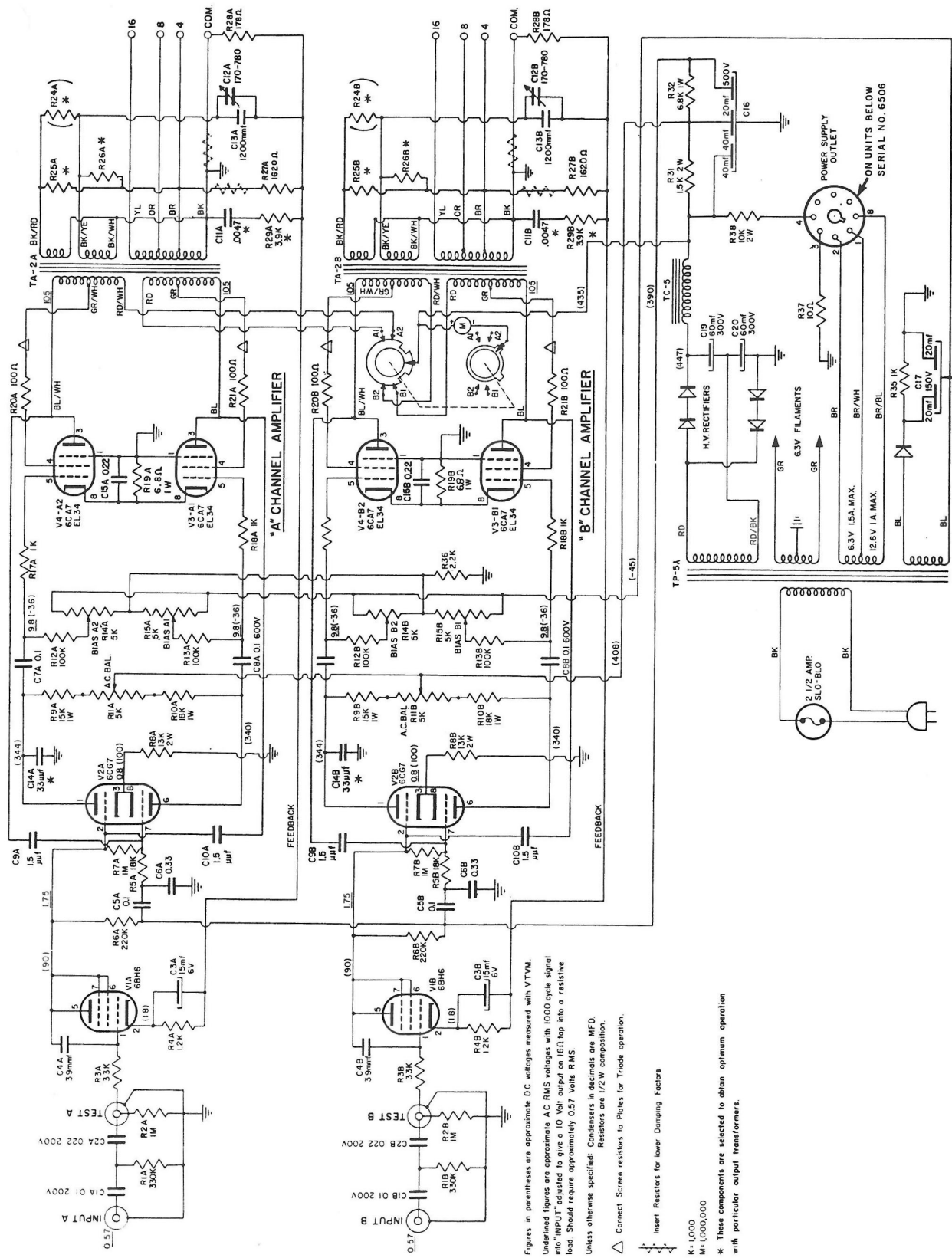
1. All indicated voltages are dc $\pm 10\%$. Fil voltage is 6.3vac.
2. All voltages measured using a VTVM.
3. All voltages measured while maintaining 117-volt line input.
4. All voltages measured with no signal (INPUT jack shorted).
5. All voltages measured with respect to chassis ground.
6. *DC voltage varies with BIAS potentiometer setting.

RESISTANCE CHART

TUBE	TYPE	PIN (OHMS)								
		1	2	3	4	5	6	7	8	9
V1A,B	6BH6	1M	13K	--	--	220K*	220K*	220K*	--	--
V2A,B	6CG7	18K*	220K	13K	--	--	22K*	--	13K	--
V3A,B	6CA7/EL34	--	--	60**	125**	100K	--	--	6.8	--
V4A,B	6CA7/EL34	--	--	60**	125**	100K	--	--	6.8	--

NOTES AND CONDITIONS:

1. All resistance measurements are in ohms, $\pm 10\%$, K = 1000, M = 1,000,000.
2. All resistances measured from chassis ground unless otherwise stated:
*measured from junction of C19 (+) and TC-5, B+ 447.
**measured from junction of R31 and TC-5, B+ 435.



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 16Ω tap into a resistive load. Should require approximately 0.57 Volt RMS.
 Unless otherwise specified: Condensers in decimals are MFD.
 Resistors are 1/2 W. composition.

△ Connect Screen resistors to Plates for Trade operation.
 † Insert Resistors for lower Damping Factors.

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

* These components are selected to obtain optimum operation with particular output transformers.

FIGURE 3. MODEL 8B STEREO POWER AMPLIFIER, SCHEMATIC DIAGRAM

PARTS LIST

REF DESIG	MARANTZ PART NO.	DESCRIPTION	REF DESIG	MARANTZ PART NO.	DESCRIPTION
C1A,B	12-1021	.1 uf, 200V, 10%, Paper	R24A,B	26-1136	33 ohms, 1 W, 10%, Carb Comp
C2A,B	12-1022	.022 uf, 200V, 10%, Paper	R25A,B		*22 ohms, ½ W, 10%, Carb Comp
C3A,B	19-1019	15 uf, 6V, Elect, w/tubing	R26A,B	26-1137	3.3 ohms, 1 W, 10%, Carb Comp
C4A,B	14-1040	3.9 pf, 5%, Cer	R27A,B	27-1089	1.62K, ½ W, 1%, Dep Carb
C5A,B	13-1018	.1 uf, 600V, 5%, Mylar	R28A,B	27-1090	178 ohms, ½ W, 1%, Dep Carb
C6A,B	13-1021	.33 uf, 400V, 10%, Mylar	R29A,B	26-1062	*4.7K, ½ W, 10%, Carb Comp
C7A,B	12-1018	.1 uf, 600V, 5%, Mylar	R31	26-1135	1.5K, 1 W, 10%, Carb Comp
C8A,B	13-1018	.1 uf, 600V, 5%, Mylar	R32	26-1138	6.8K, 1 W, 10%, Carb Comp
C9A,B	14-1020	*1.5 pf, 5%, Cer	R35	26-1060	1K, ½ W, 10%, Carb Comp
C10A,B	14-1020	*1.5 pf, 5%, Cer	R36	26-1061	2.2K, ½ W, 10%, Carb Comp
C11A,B	14-1012	*4700 pf, 20%, Cer	R37	26-1149	10 ohms, 1 W, 10%, Carb Comp
C12A,B	21-1012	170-780 pf, Trimmer	R38	26-1011	10K, ½ W, 10%, Carb Comp
C13A,B	17-1033	*1000 pf, 500V, 5%, Mica	R39	26-1057	150 ohms, ½ W, 10%, Carb Comp
C14A,B	14-1046	*33 pf, 1KV, 10%, Cer	TA-2A,B	52-1006	Transformer, Output
C15A,B	12-1004	.22 uf, 200V, 10%, Paper	TC-5	55-1046	Choke
C16	18-1009	40-40-20 uf 500V, Elect	TP-5A	52-1005	Transformer, Power
C17	19-1020	20-20 uf, 150V, Elect	V1A,B	37-1011	Tube, Type 6BH6
C19	18-1008	60 uf, 300V, Elect	V2A,B	37-1013	Tube, Type 6CG7
C20	18-1008	60 uf, 300V, Elect	V3A,B	37-1012	Tube, Type 6CA7/EL34
R1A,B	26-1116	330K, ½ W, 10%, Carb Comp	V4A,B	37-1012	Tube, Type 6CA7/EL34
R2A,B	26-1079	1 M, ½ W, 10%, Carb Comp	92-1012		Cable, Audio, Brown
R3A,B	26-1130	33K, ½ W, 5%, Carb Comp	92-1013		Cable, Audio, White
R4A,B	26-1132	1.2K, ½ W, 5%, Carb Comp	90-1062		Feet, Plastic
R5A,B	26-1131	12K, ½ W, 5%, Carb Comp	41-1005		Fuse, 2½ Amp, Type MDL
R6A,B	26-1139	220K, 1 W, 5%, Carb Comp	60-1043		Knob
R7A,B	26-1079	1 M, ½ W, 10%, Carb Comp	92-1003		Line Cord (with Plug)
R8A,B	27-1091	13K, 2W, 5%, Dep Carb	44-1019		Meter
R9A,B	26-1134	15K, 1 W, 10%, Carb Comp	59-1017		Nameplate
R10A,B	26-1133	18K, 1 W, 10%, Carb Comp	42-1000		Post, Fuse
R11A,B	33-1035	5K, 2 W, WW Pot	35-1034		Rect, Bias
R12A,B	26-1129	100K, ½ W, 5%, Carb Comp	35-1035		Rect, H.V.
R13A,B	26-1129	100K, ½ W, 5%, Carb Comp	46-1014		Switch, Rotary
R14A,B	33-1035	5K, 2 W, WW Pot	90-1000		Strain Relief
R15A,B	33-1036	5K, 2 W, WW Pot			
R17A,B	26-1060	1K, ½ W, 10%, Carb Comp			
R18A,B	26-1060	1K, ½ W, 10%, Carb Comp			
R19A,B	26-1082	6.8 ohms, 1 W, 10%, Carb Comp			
R20A,B	26-1056	100 ohms, ½ W, 10%, Carb Comp			
R21A,B	26-1056	100 ohms, ½ W, 10%, Carb Comp			

NOTES:

1. Cer = Ceramic
Elect = Electrolytic
Carb Comp = Carbon Composition
Dep Carb = Deposited Carbon
2. *Indicates value selected to match output transformer



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