

SERVICE  
MANUAL 1060

**marantz®**

model 1060

console *Stereo* amplifier

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## 1. INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model 1060 Stereo Console Amplifier.

Service information and voltage data included in this manual are intended for use by the knowledgeable and experienced technician only. All instruction should be read carefully. No attempt should be made to proceed without a good understanding of the operation in the circuits.

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

## 2. PRE-AMPLIFIER

Signals from the input jacks (TUNER, TAPE, AUX & AUX 2) are applied to the selector switch.

Signals from the PHONO or MIC/AUX 2 jacks are applied to the other section of the selector switch, then, led to the phono-amplifier and equalized to match the RIAA curve for flat frequency response. The gain of the phono-amplifier consisting of H901, H903 and H905 is 40 dB.

The outputs of the phono-amplifier are led to the selector switch. The selector switch selects one of signals from PHONO, MIC, TUNER, TAPE, AUX or AUX 2 jacks and send it to the TAPE MONITOR switch and TAPE OUT jacks. The selected signal is then applied to the balance and volume controls, then, to the pre-amplifier consisting of H401 H403, H405 and H407 through Mono switches.

The frequency response is varied by the Bass, Middle and Treble controls and the resultant output are led to PRE OUT jacks through High-cut and Low-cut filter networks. These networks are switched in and out from the circuit by the push-switches.

## 3. MAIN AMPLIFIER

Transistor H701 is a pre-driver coupled to the transistor H703 through capacitor C711. The Transistor H703 drives the inverter transistors H709 and H711 which, in turn, drive the power stage consisting of H001 and H002. Transistors H705 and H707 are current limiter operating as a power protection circuits.

Excessive currents flowing into the power stage are detected by the resistors R741 and R745 and the resultant variations are applied to the transistors H705 and H707 and make them turned on. This decreases the current flowing into the H709 and H711. In this way the currents flowing in the power stage (H001 and H002) are restricted within a safe value.

## 4. POWER SUPPLY UNIT

This power supply unit consisting of a transistor H801, which operates as a ripple filter, provides +35V DC to the phono-amplifier and +27V DC to the pre-amplifier (Tone Amplifier).

## 5. TROUBLE ANALYSIS

1. Excessive line consumption
  - a. Check for shorted H007, H802, H803.
  - b. Check for shorted transistor H001 through H004.  
Check L001 for short.
2. No line consumption or zero bias
  - a. Check line cord, fuse, shorted H005, H006, H713, H714.
  - b. Check for open rectifiers H007, H802, H803 or open L001.
3. High hum and noise level
  - a. Check filter capacitors C003, C703, C704.
4. Parasitic oscillation
  - a. Check for defective C713, C714, C727 through C730.
5. Improper clipping
  - a. Check for proper adjustment R723 and R724.

## 6. POWER AMPLIFIER ADJUSTMENT

1. Connect a VTVM across the resistor R747 and adjust the trimming resistor R729 until the VTVM reads 7.5mV DC. For the other channel connect the VTVM across the R748 and adjust the R730 for the same reading.
2. Connect an oscilloscope across the speaker terminals. Apply an audio signal of 1 KHz to the AUX jacks and increase the audio signal until the audio output on the scope begin to clip. Adjust the trimming resistor R723 for equal and symmetrical clipping. For the other channel adjust the R724.

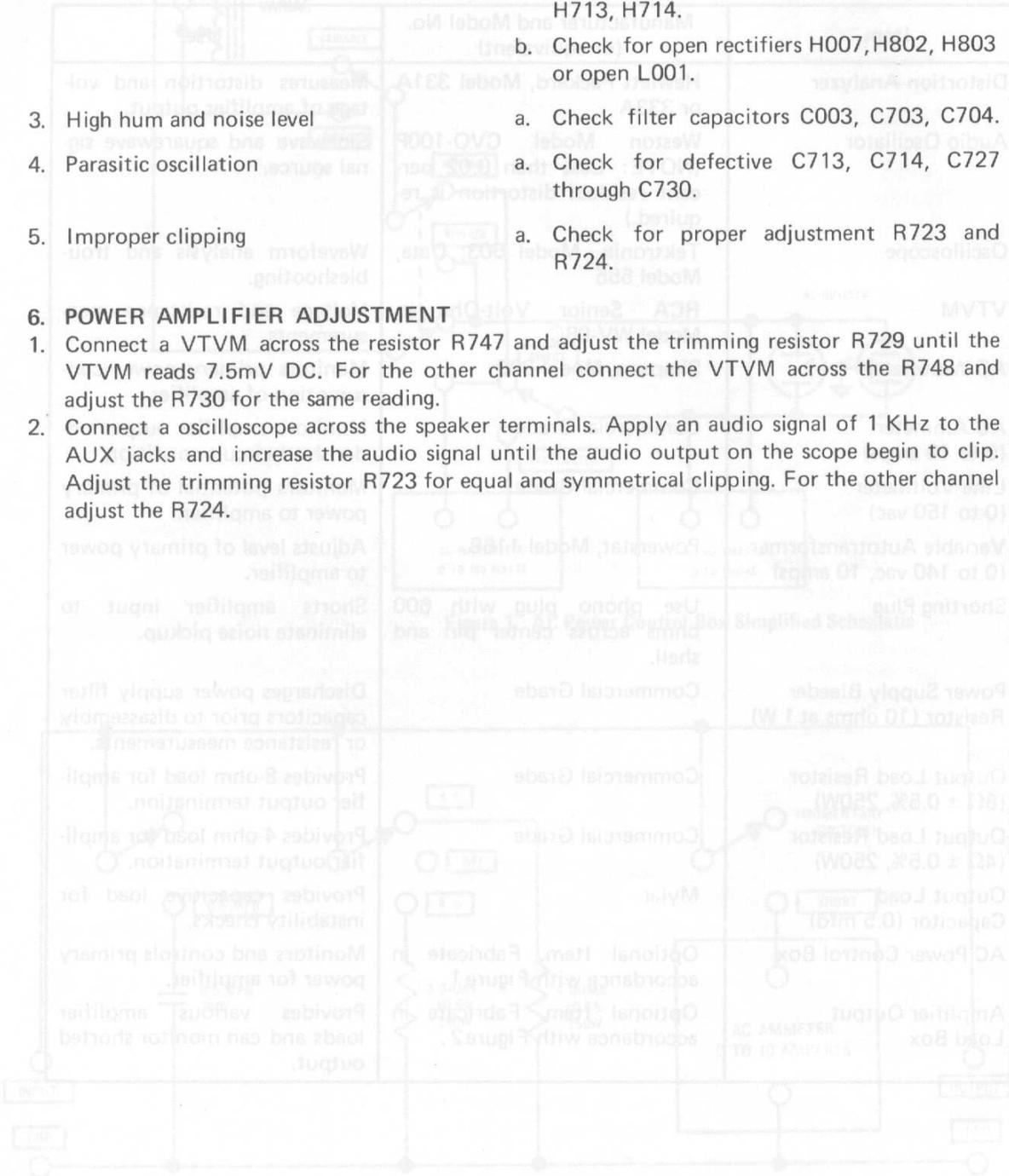


Figure 2. Amplifier Output Load Box Simplified Schematic

7. TEST EQUIPMENT REQUIRED FOR SERVICING

Table 1 lists the test equipment required for servicing the Model 1060 Stereo Console Amplifier. The wattmeter, ac voltmeter, and variac may be assembled as a test fixture as shown schematically in Figure 1, and the load resistors and ac ammeter may be assembled into a second test fixture as shown in Figure 2.

Item	Manufacturer and Model No. (or equivalent)	Use
Distortion Analyzer	Hewlett Packard, Model 331A or 333A	Measures distortion and voltage of amplifier output.
Audio Oscillator	Weston Model CVO-100P (NOTE: Less than 0.02 percent residual distortion is required.)	Sinewave and squarewave signal source.
Oscilloscope	Tektronix, Model 503; Data, Model 555	Waveform analysis and troubleshooting.
VTVM	RCA Senior Volt-Ohmyst, Model WV-98C	Voltage and resistance measurements.
AC Wattmeter	Simpson, Model 390	Monitors primary power consumption of amplifier.
AC Ammeter (0 to 10 amps)	Commercial Grade	Monitors amplifier output under short circuit condition.
Line Voltmeter (0 to 150 vac)	Commercial Grade	Monitors potential of primary power to amplifier.
Variable Autotransformer (0 to 140 vac, 10 amps)	Powerstat, Model 116B	Adjusts level of primary power to amplifier.
Shorting Plug	Use phono plug with 600 ohms across center pin and shell.	Shorts amplifier input to eliminate noise pickup.
Power Supply Bleeder Resistor (10 ohms at 1 W)	Commercial Grade	Discharges power supply filter capacitors prior to disassembly or resistance measurements.
Output Load Resistor (8Ω ± 0.5%, 250W)	Commercial Grade	Provides 8-ohm load for amplifier output termination.
Output Load Resistor (4Ω ± 0.5%, 250W)	Commercial Grade	Provides 4-ohm load for amplifier output termination.
Output Load Capacitor (0.5 mfd)	Mylar	Provides capacitive load for instability checks.
AC Power Control Box	Optional Item. Fabricate in accordance with Figure 1.	Monitors and controls primary power for amplifier.
Amplifier Output Load Box	Optional Item. Fabricate in accordance with Figure 2.	Provides various amplifier loads and can monitor shorted output.

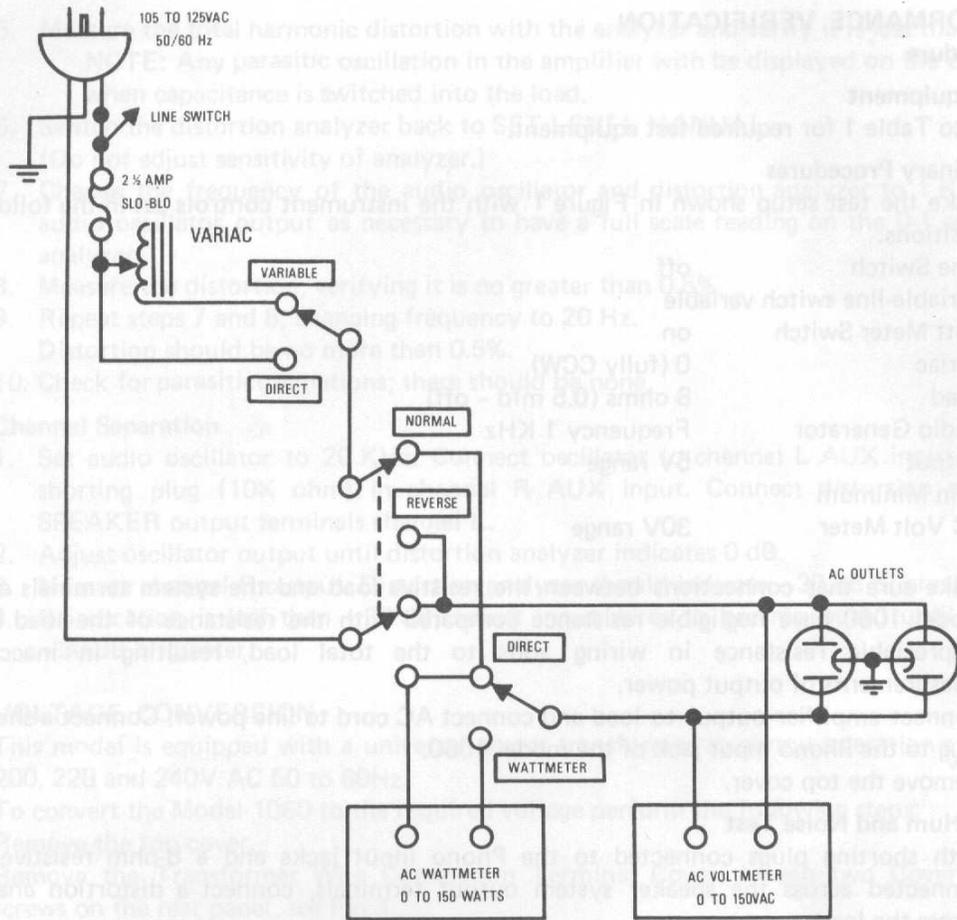


Figure 1. AC Power Control Box Simplified Schematic

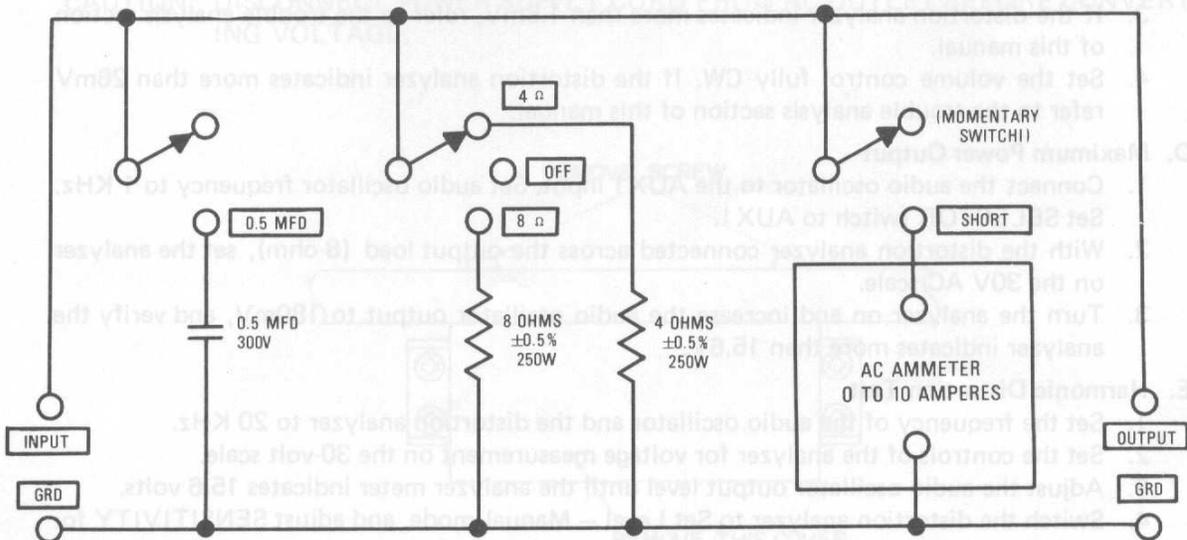


Figure 2. Amplifier Output Load Box Simplified Schematic

## 8. PERFORMANCE VERIFICATION OR SERVICING

### Test Procedure

#### A. Test Equipment

Refer to Table 1 for required test equipment.

#### B. Preliminary Procedures

1. Make the test setup shown in Figure 1 with the instrument controls set in the following positions:

Line Switch	off
Variable-line switch	variable
Watt Meter Switch	on
Variac	0 (fully CCW)
Load	8 ohms (0.5 mfd - off)
Audio Generator	Frequency 1 KHz
Output	5V range
Gain Minimum	
AC Volt Meter	30V range

2. Make sure that connections between the resistive load and the system terminals of the Model 1060 have negligible resistance compared with the resistance of the load itself. Appreciable resistance in wiring adds to the total load, resulting in inaccurate measurements of output power.
3. Connect amplifier output to load and connect AC cord to line power. Connect a shorting plug to the Phono input jack of the model 1060.
4. Remove the top cover.

#### C. Total Hum and Noise Test

1. With shorting plugs connected to the Phono input jacks and a 8-ohm resistive load connected across the speaker system output terminals, connect a distortion analyzer across the load.

NOTE: In this test and tests that follow, if distortion analyzer used does not contain a built-in voltmeter, a VTVM may be substituted.

2. Set the distortion analyzer controls for voltage measurements and apply power to the amplifier. Set the volume control fully CCW. Set the SELECTOR switch to PHONO.
3. If the distortion analyzer indicates more than 1.5mV, refer to the trouble analysis section of this manual.
4. Set the volume control fully CW. If the distortion analyzer indicates more than 26mV refer to the trouble analysis section of this manual.

#### D. Maximum Power Output

1. Connect the audio oscillator to the AUX1 input. Set audio oscillator frequency to 1 KHz. Set SELECTOR switch to AUX1.
2. With the distortion analyzer connected across the output load (8-ohm), set the analyzer on the 30V AC scale.
3. Turn the analyzer on and increase the audio oscillator output to 180mV, and verify the analyzer indicates more than 15.6V.

#### E. Harmonic Distortion Test

1. Set the frequency of the audio oscillator and the distortion analyzer to 20 KHz.
2. Set the controls of the analyzer for voltage measurement on the 30-volt scale.
3. Adjust the audio oscillator output level until the analyzer meter indicates 15.6 volts.
4. Switch the distortion analyzer to Set Level - Manual mode, and adjust SENSITIVITY for full scale reading on 0-1 scale.

5. Measure the total harmonic distortion with the analyzer and verify it is less than 0.5%.  
NOTE: Any parasitic oscillation in the amplifier will be displayed on the oscilloscope when capacitance is switched into the load.
6. Switch the distortion analyzer back to SET LEVEL MANUAL.  
(Do not adjust sensitivity of analyzer.)
7. Change the frequency of the audio oscillator and distortion analyzer to 1 KHz. Adjust audio oscillator output as necessary to have a full scale reading on the 0-1 scale on the analyzer.
8. Measure the distortion, verifying it is no greater than 0.5%.
9. Repeat steps 7 and 8, changing frequency to 20 Hz.  
Distortion should be no more than 0.5%.
10. Check for parasitic oscillations; there should be none.

#### F. Channel Separation

1. Set audio oscillator to 20 KHz. Connect oscillator to channel L AUX input only, with shorting plug (10K ohm) in channel R AUX input. Connect distortion analyzer to SPEAKER output terminals channel L.
2. Adjust oscillator output until distortion analyzer indicates 0 dB.
3. Measure channel R output. Distortion analyzer should indicate -30 dB or greater.
4. If indication is less than -30 dB, adjust input wires to preamp board until reading is -30 dB or greater.

#### 9. VOLTAGE CONVERSION

This model is equipped with a universal power transformer to permit operation at 100, 120, 200, 220 and 240V AC 50 to 60Hz.

To convert the Model 1060 to the required voltage perform the following steps:

1. Remove the top cover.
2. Remove the Transformer Wire Connection Terminal Cover, loosen two Cover mounting screws on the rear panel, see Fig.3 .
3. Change the jumper wires as illustrated in Fig. 4 for the required AC voltage and replace the fuse as instructed.

**CAUTION: DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE.**

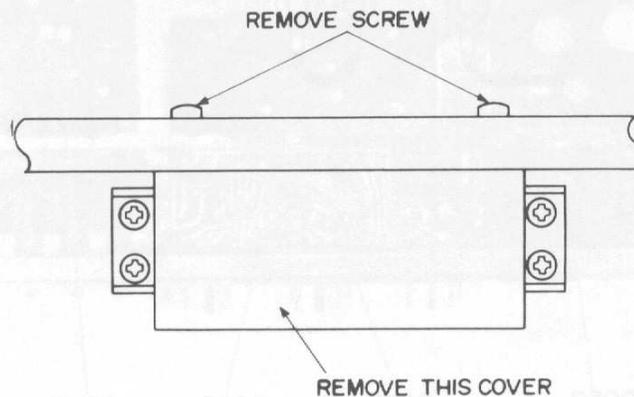


Figure 3. Remove the Terminal Cover

8. PERFORMANCE VERIFICATION  
 NOTE: Any periodic oscillation in the amplifier will be displayed on the oscilloscope when impedance is switched into the load.  
 A. Test Equipment  
 Refer to Table 1 at the rear of this manual for a list of test equipment.  
 B. Test Procedure  
 1. Connect the frequency of the audio oscillator and distortion analyzer to 1 kHz. Adjust the oscillator output as necessary to have a full scale reading on the 0.1 scale on the

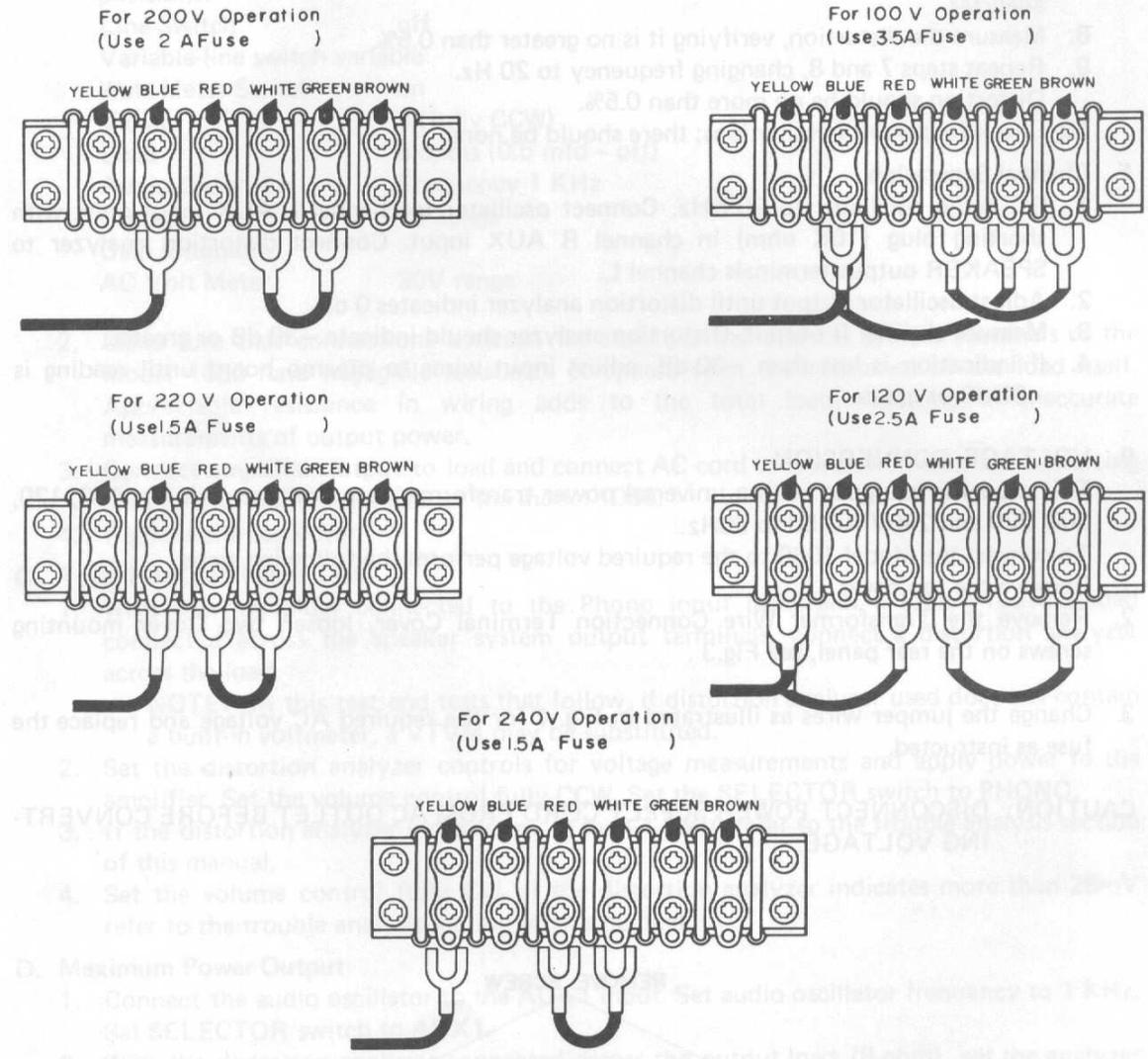


Figure 4. Voltage Conversion Chart

D. Maximum Power Output:  
 1. Connect the audio oscillator and distortion analyzer to the terminals of the SELECTOR switch.  
 2. With the distortion analyzer connected to the terminals of the 30V AC scale.  
 3. Turn the analyzer on and adjust the oscillator output to have a full scale reading on the 0.1 scale on the distortion analyzer.  
 4. Read the maximum power output from the scale.  
 5. Repeat the procedure for the other voltage settings.  
 6. The maximum power output for each voltage setting is listed in Table 2.

Harmonic Distortion Test:  
 1. Set the frequency of the audio oscillator and distortion analyzer to 1 kHz.  
 2. Set the control of the distortion analyzer for voltage to 18.5V.  
 3. Adjust the audio oscillator output to have a full scale reading on the 0.1 scale on the distortion analyzer.  
 4. Switch the distortion analyzer to the HARMONIC DISTORTION position.  
 5. Read the harmonic distortion from the scale.  
 6. Repeat the procedure for the other voltage settings.  
 7. The harmonic distortion for each voltage setting is listed in Table 3.

Figure 3. Remove the Terminal Cover

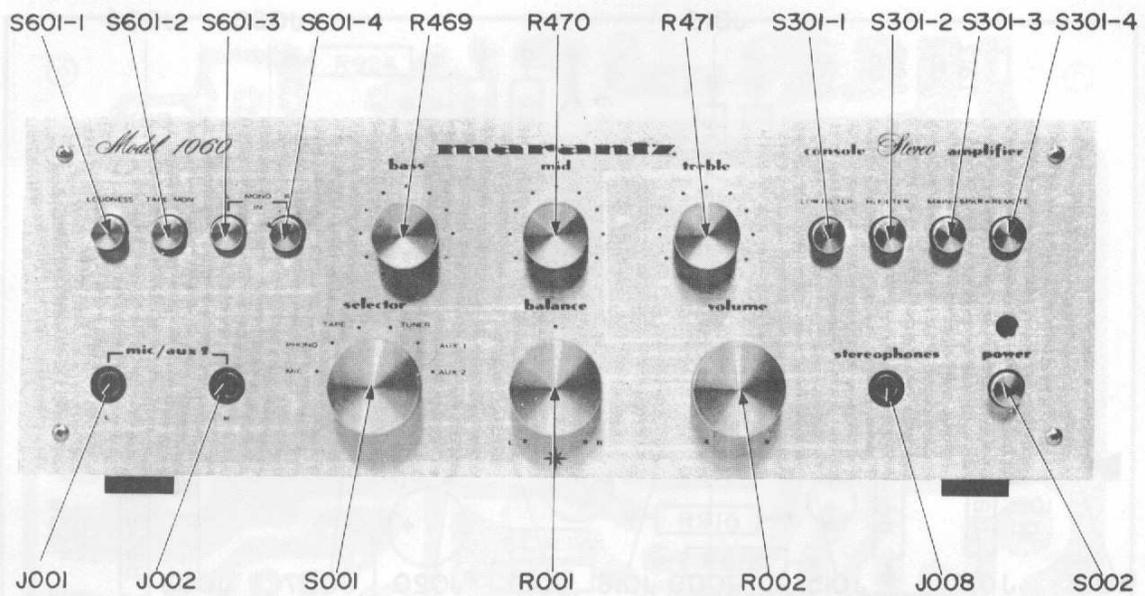


Figure 5. Front Panel Adjustment and Component Locations

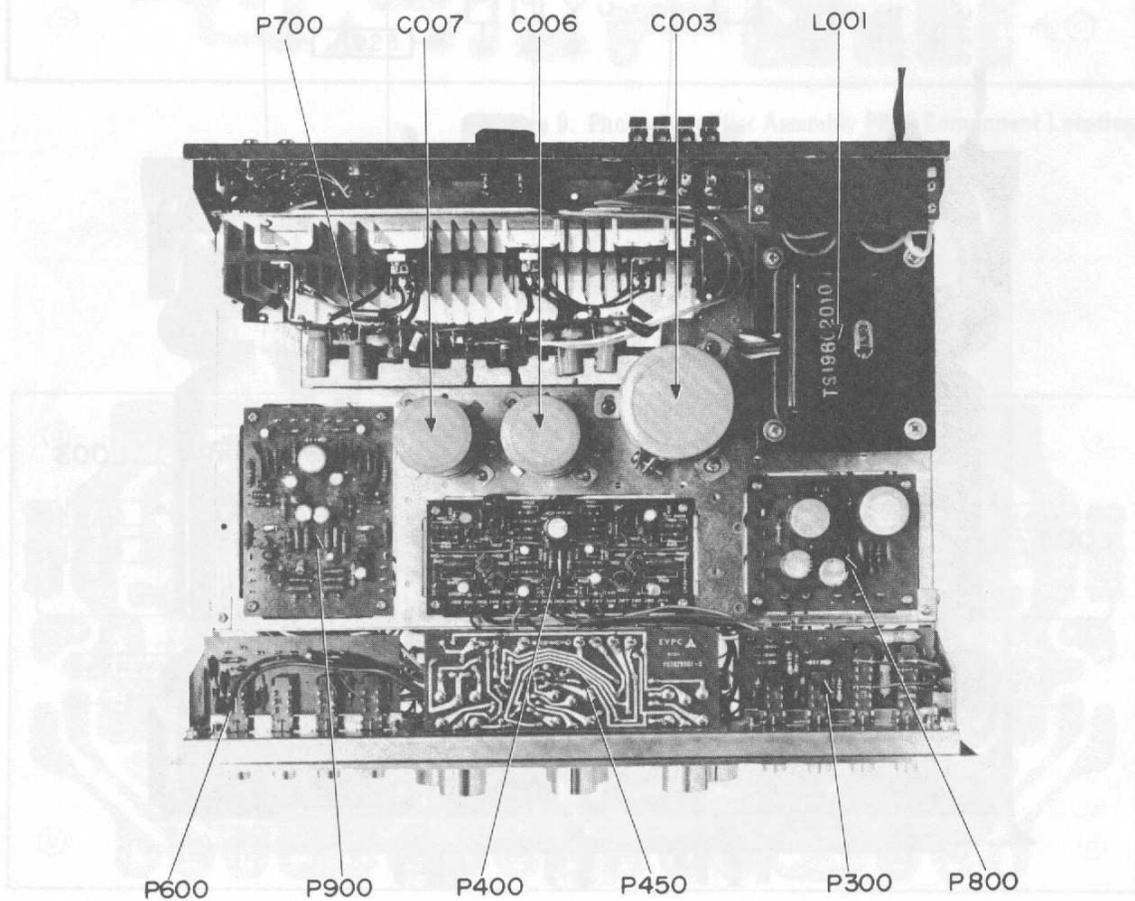


Figure 6. Main Chassis Component Locations (Top View)

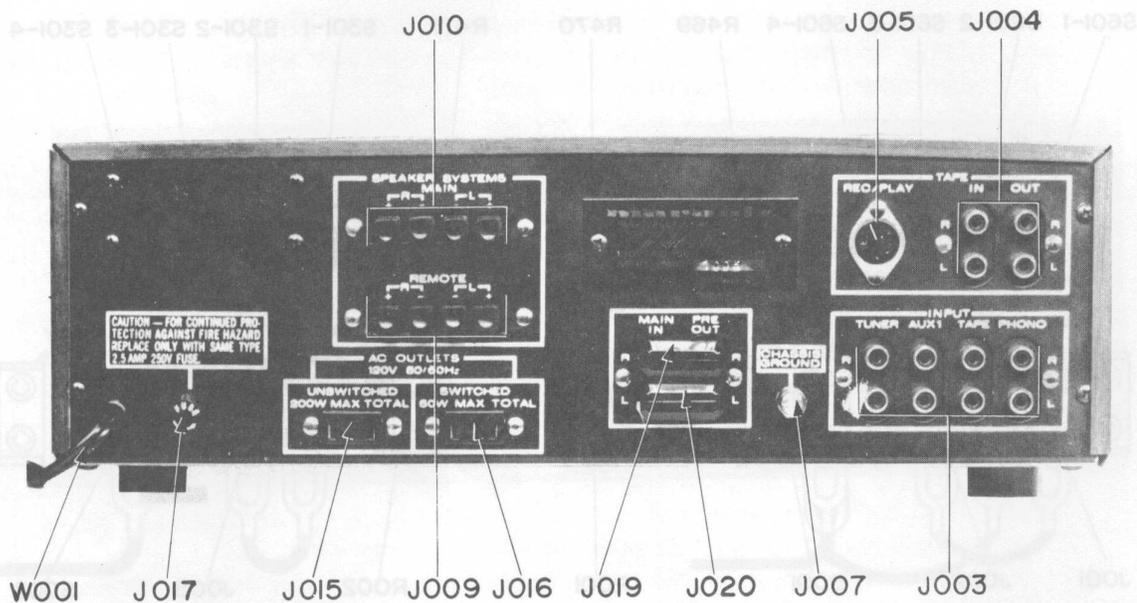


Figure 7. Rear Panel Adjustment and Component Locations

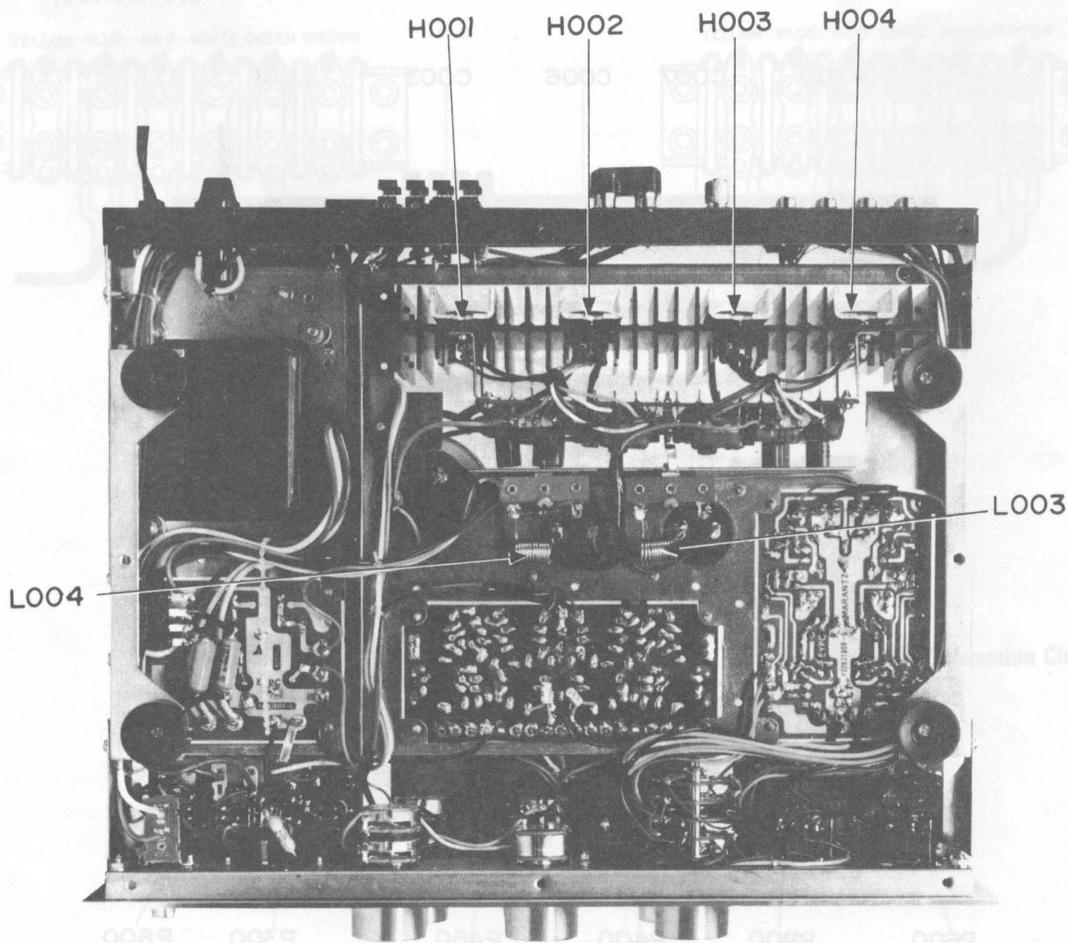


Figure 8. Main Chassis Component Locations (Bottom View)

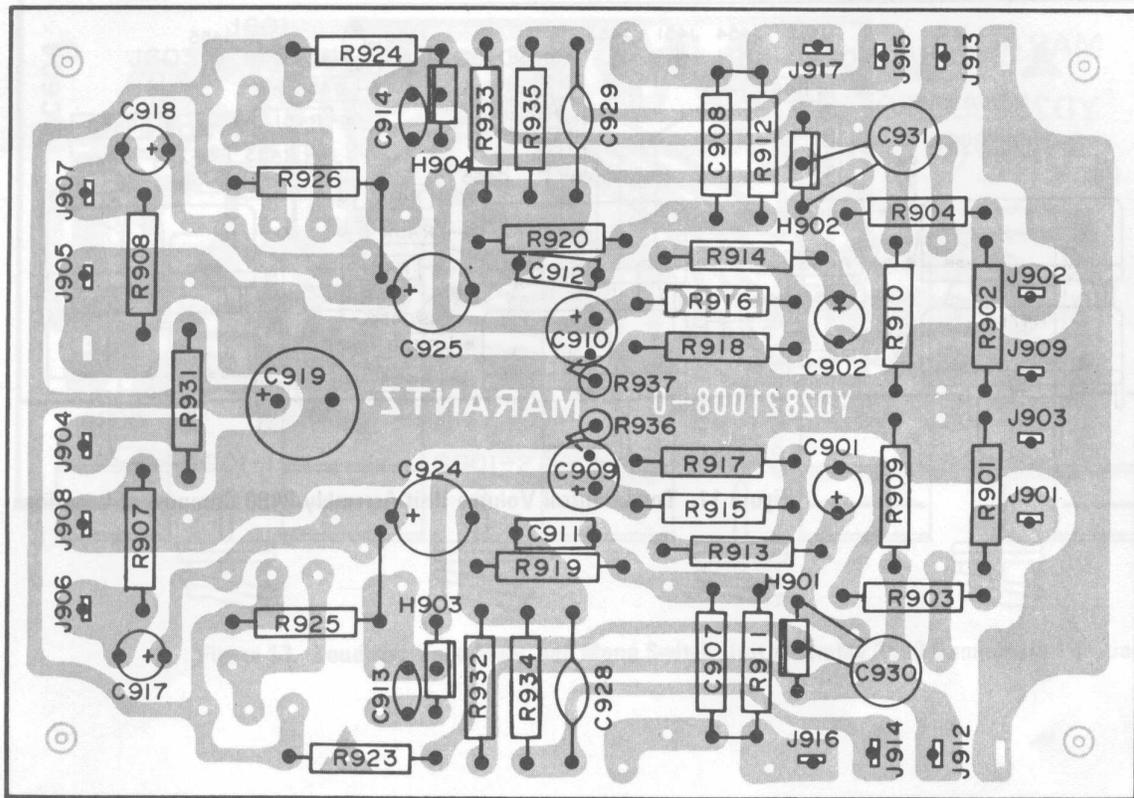


Figure 9. Phono Amplifier Assembly P900 Component Locations

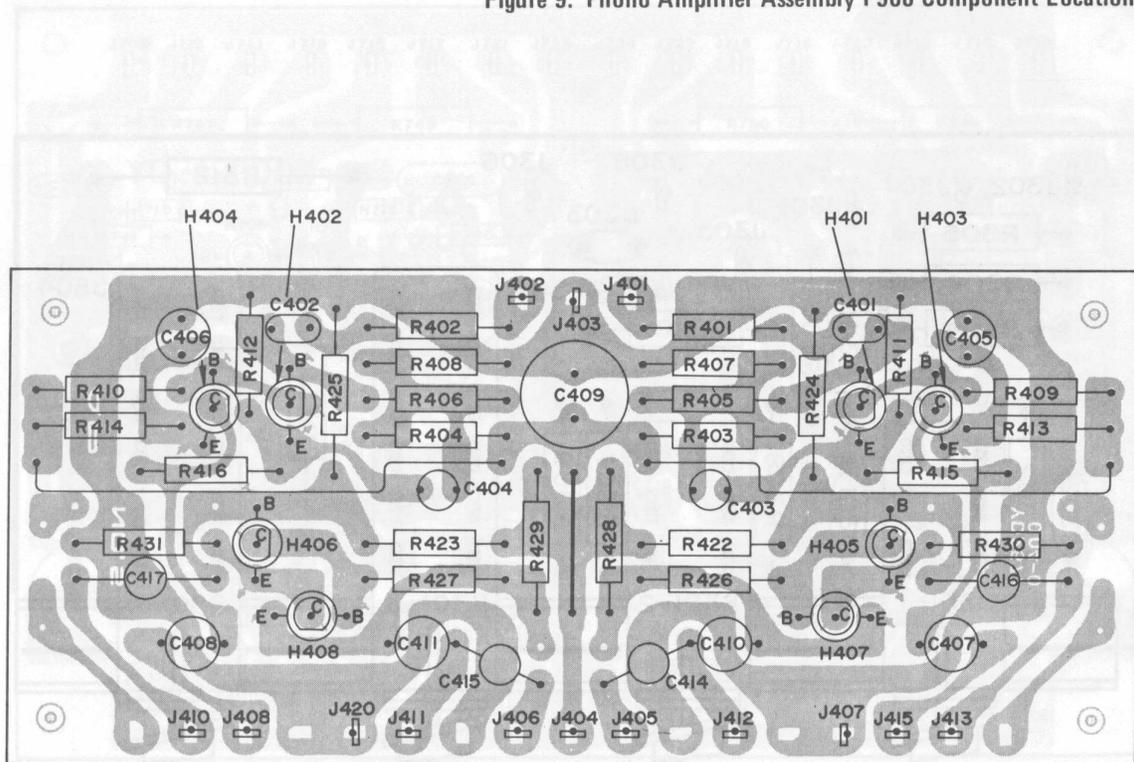


Figure 10. Tone and Pre-Amplifier Assembly P400 Component Locations

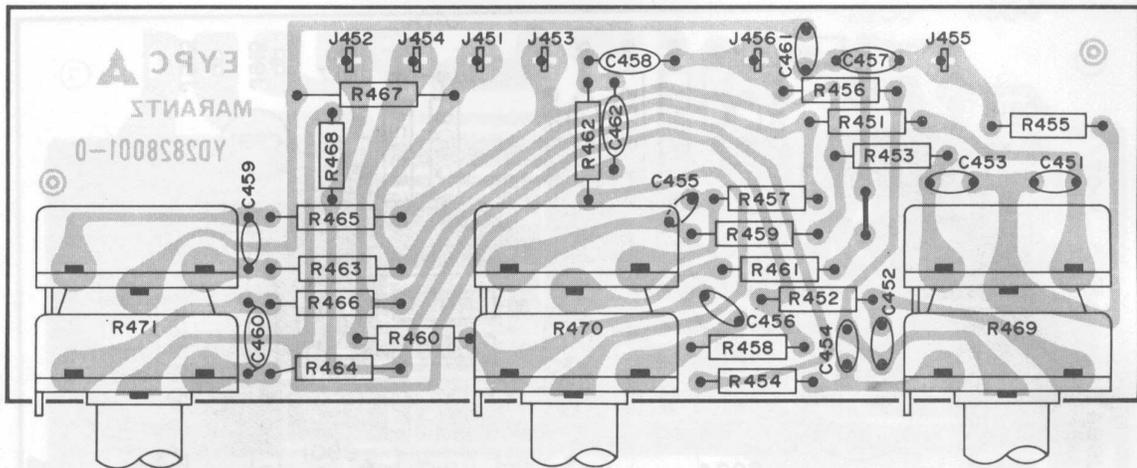


Figure 11. Tone Control Volume Unit Assembly P450 Component Locations

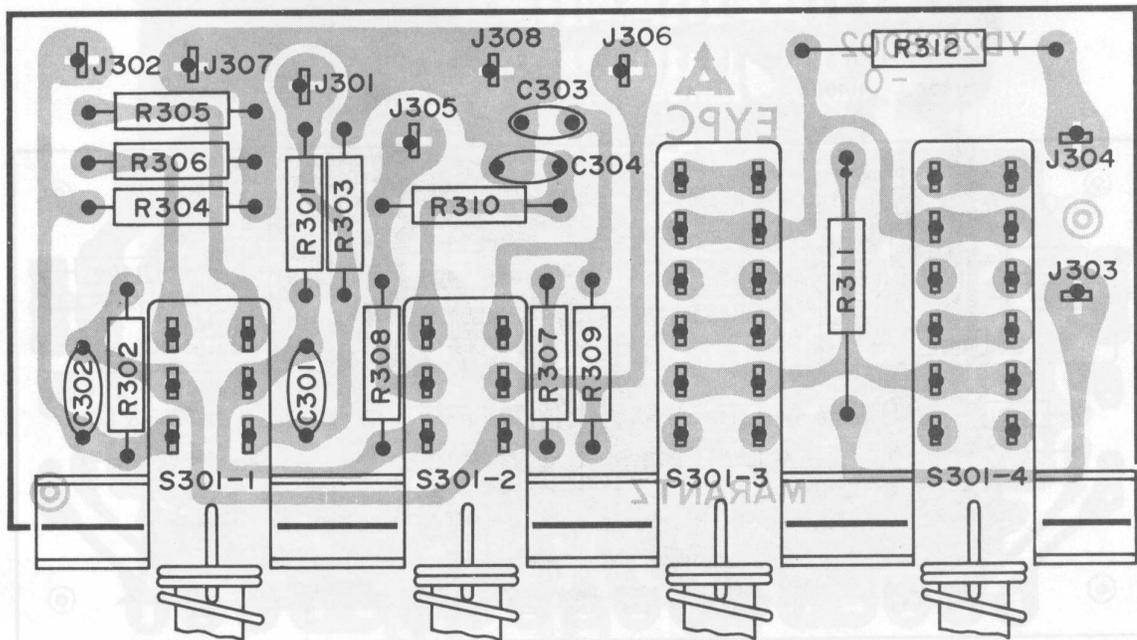


Figure 12. Main, Remote, High and Low Filter Unit Assembly P300 Component Locations

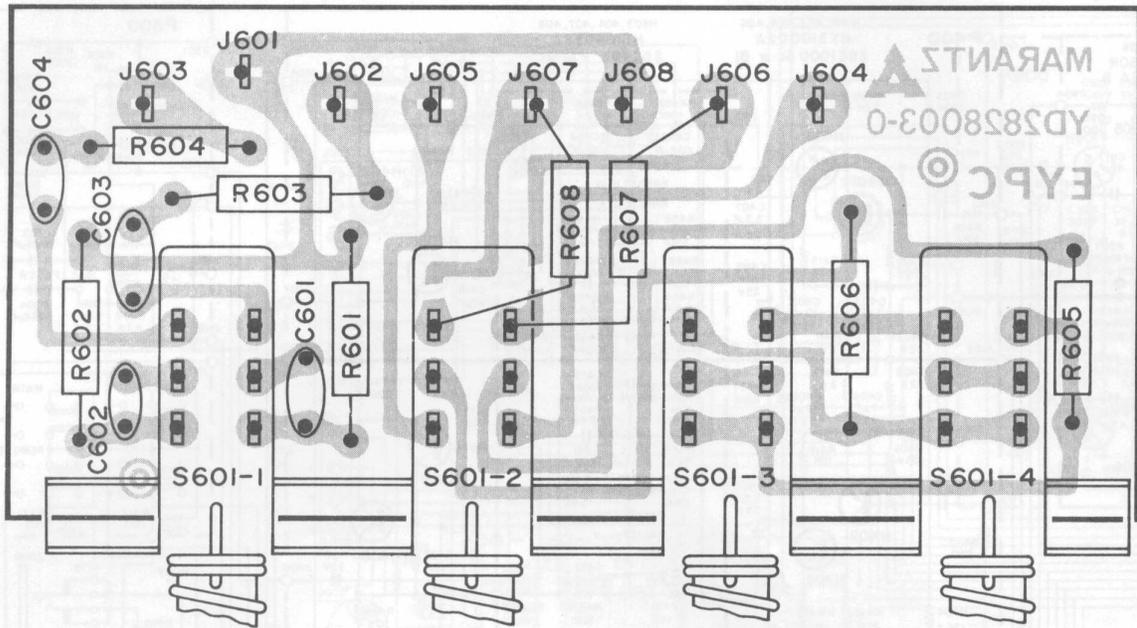


Figure 13. Loudness, Tape Moni. and Mono Switch Unit Assembly P600 Component Locations

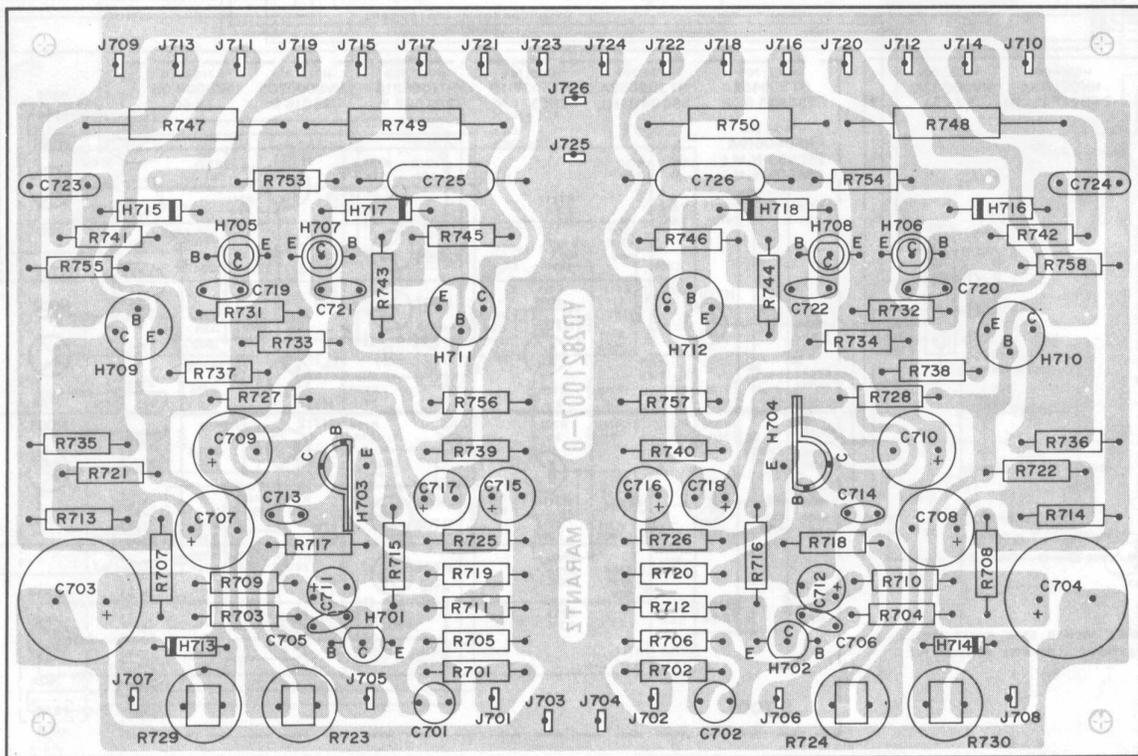


Figure 14. Power Amplifier Assembly P700 Component Locations

Figure 13. Schematic Diagram  
13

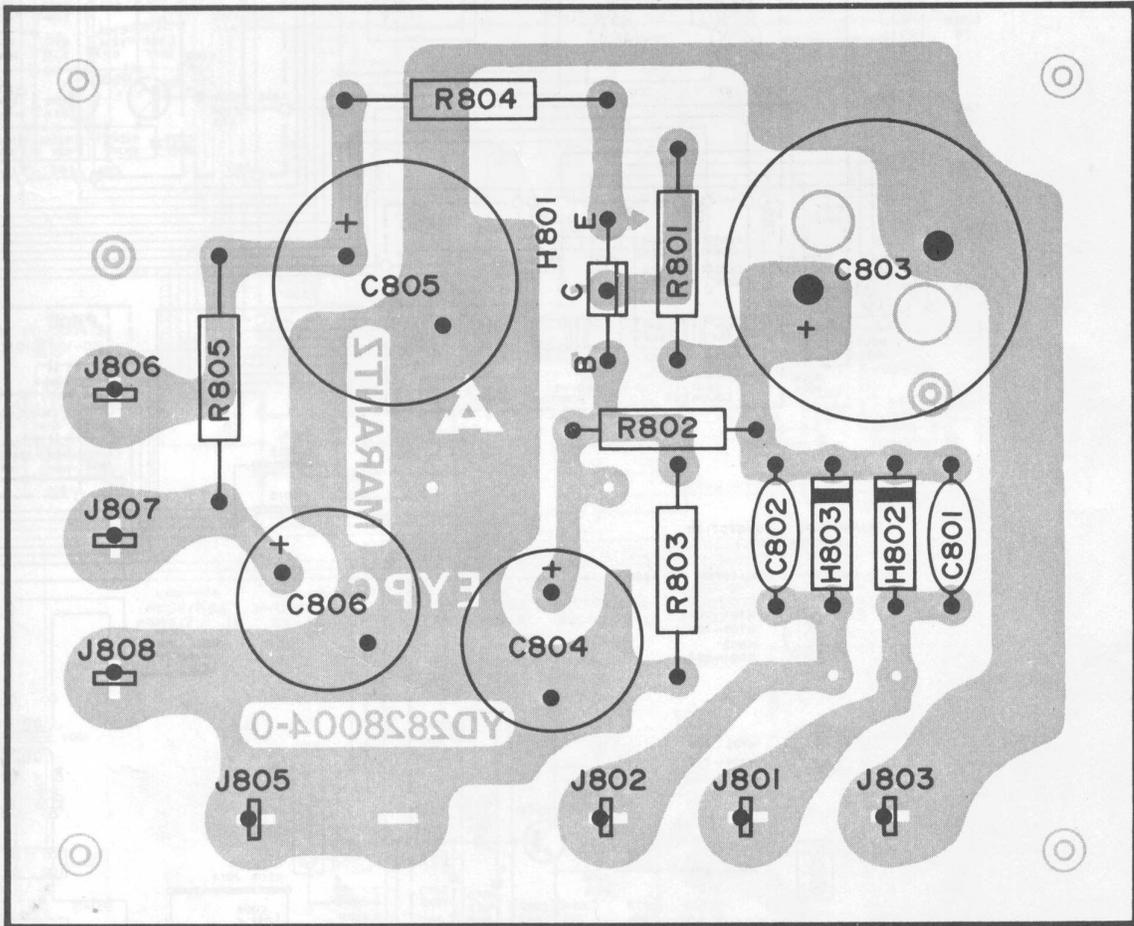
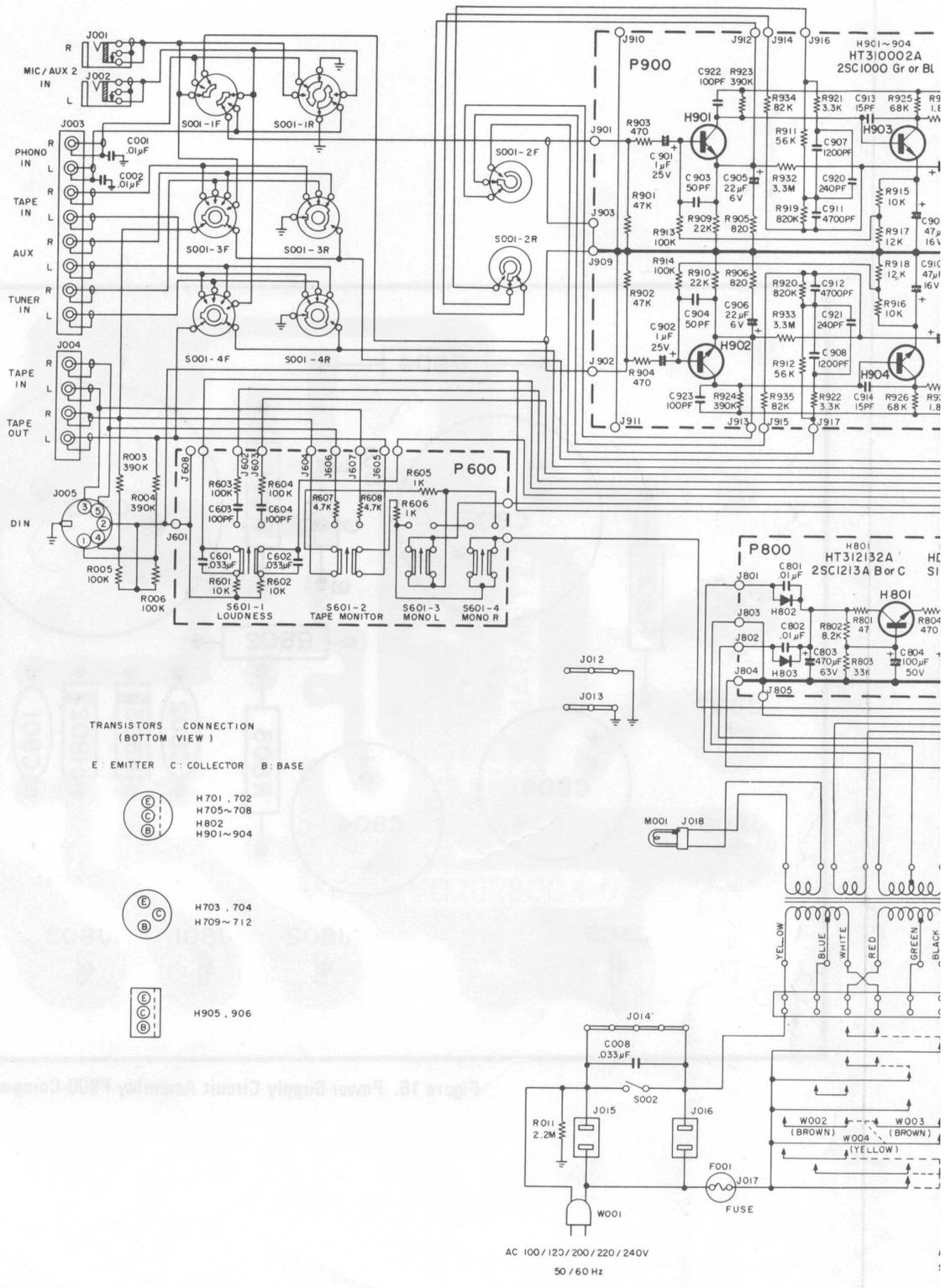


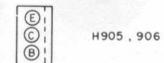
Figure 15. Power Supply Circuit Assembly P800 Component Locations

45  
29  
30



TRANSISTORS CONNECTION (BOTTOM VIEW)

E: EMITTER C: COLLECTOR B: BASE



AC 100 / 120 / 200 / 220 / 240V  
50 / 60 Hz

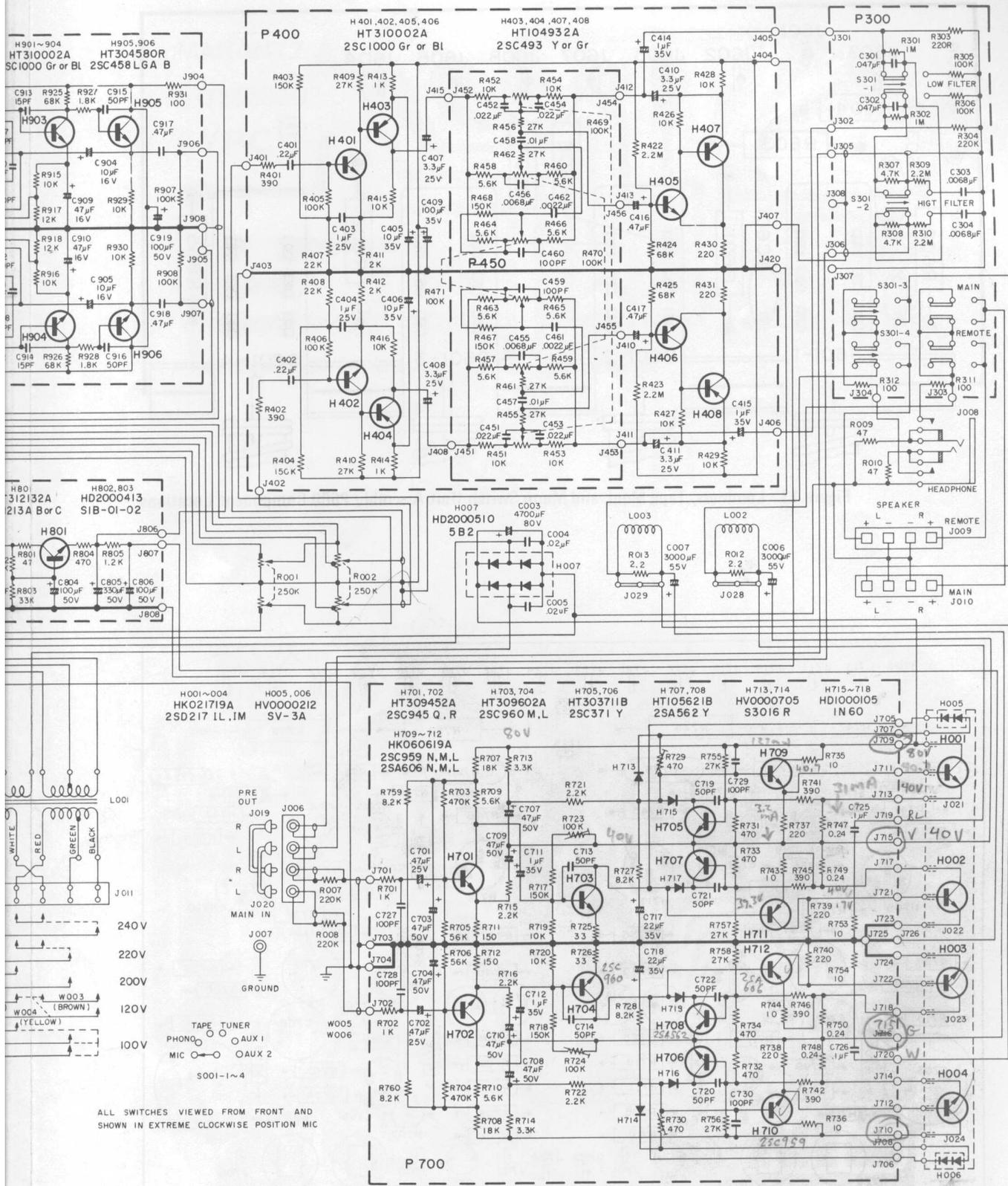


Figure 16. Schematic Diagram

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
A	282806340	Escutcheon assembly	0316	282812003	Insulator
0102	282806301	Escutcheon	0317	282111801	Spacer
0121	257812001	Insulator x 3			
0116	282805301	Cover	0318	281926704	Heat sink x 4
0402	51122608E	T H M screw x 4	0319	257711806	Spacer x 6
			0322	54010089R	Washer
B	282816040	Rear bracket assembly	0329	282711801	Spacer x 3
0130	282816002	Bracket	0403	51100406S	B H M screw x 4
J003	YT0208002	8P terminal	0404	54020401S	Flat washer P x 4
J004	YT0204003	4P terminal x 2	0406	51100406S	B H M screw x 8
J005	YJ1100001	Din socket	0407	54020401S	Flat washer P x 8
J009	YT0304002	4P SPKR terminal x 2	0409	51570410B	P H tapt screw x 4
J015	YJ0400018	AC outlet x 2	0410	54020401E	Flat washer x 4
0432	511003081S	B H M screw x 2			
0505	55060307E	T R rivet x 2	0411	54040402N	Spring washer x 4
			0416	51570306B	P H tapt screw x 6
0103	282825701	Lid	0417	51570306B	P H tapt screw x 4
0104	282825702	Lid	0418	51570306B	P H tapt screw x 4
0105	282826501	Indicator	0419	51570306B	P H tapt screw x 2
0109	282815401	Knob x 3	0420	51570312B	P H tapt screw x 4
0110	282815402	Knob x 3	0421	51570306B	P H tapt screw x 2
0111	281815401	Knob x 8	0426	51100306S	B H M screw x 4
0112	281815402	Knob	0427	51100306S	B H M screw x 2
0117	282805302	Cover	0428	51100306S	B H M screw x 2
0122	275905701	Leg x 4			
0123	281825905	Bush x 9	0429	51100306S	B H M screw x 2
			0430	51570312B	P H tapt screw x 4
0202	282810501	Chassis	0433	51100306E	B H M screw x 2
0204	282816050	Bracket K	0434	51100308S	B H M screw x 2
0209	282816003	Bracket	0501	51100308S	B H M screw x 2
0210	282816004	Bracket	0502	51100308S	B H M screw x 4
0213	282816007	Bracket x 4	0503	53110303E	Hexagon nut x 12
0215	282826701	Heat sink	0506	54050300R	T L washer OR x 4
0216	282826703	Heat sink x 4	0507	53110403E	Hexagon nut
0217	282812001	Insulator	0509	54050400R	T L washer OR
0218	282812002	Insulator			
0221	282816013	Bracket	0510	54020401E	Flat washer P
			0516	51570306B	P H tapt screw x 4
0222	282816014	Bracket	0517	51570306B	P H tapt screw x 4
0226	273116014	Bracket x 2	0518	51570306B	P H tapt screw x 2
0227	71400219Q	Spring	0519	51570306B	P H tapt screw x 8
0228	54110099A	Washer x 4	0520	51060314E	P H M screw x 8
0229	281812001	Insulator	0526	51570306B	P H tapt screw x 10
0230	276325901	Bush	0527	51570306B	P H tapt screw x 8
0232	318827102	Holder	0528	51570306B	P H tapt screw x 6
0301	138200503	Clamper x 8	0529	51570306B	P H tapt screw x 12
0302	273105302	Cover			
0303	202705501	Collar x 4	0530	51570306B	P H tapt screw x 4
			0531	51570306B	P H tapt screw
0304	282126902	Protector	0532	54050300R	T L washer OR
0305	281816006	Bracket	0533	62031340W	Lug
0306	282026702	Heat sink x 2	0601	51570306B	P H tapt screw x 2
0311	257711803	Spacer x 2	0602	51570306B	P H tapt screw x 6
0312	145525901	Bush	0603	51570306B	P H tapt screw
0313	250712001	Insulator	0604	51570306B	P H tapt screw x 8
0314	273025901	Bush	0606	54050300R	T L washer OR x 17
0315	282112001	Insulator x 2	0609	51570408B	P H tapt screw x 3

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0612	53110403E	Hexagon nut x 4	R907-R908	RT0510414	Carbon, 100K $\Omega$ , $\pm$ 5%, 1/4W
0613	54040402N	Spring washer x 4	R909-R910	RT0522314	Carbon, 22K $\Omega$ , $\pm$ 5%, 1/4W
0616	62031650W	Lug	R911-R912	RT0556314	Carbon, 56K $\Omega$ , $\pm$ 5%, 1/4W
0631	51570312B	P H tapt screw x 2	R913-R914	GT0510412	Carbon, 100K $\Omega$ , $\pm$ 5%, 1/2W
0632	54050300R	T L washer OR x 2	R915-R916	RT0510314	Carbon, 10K $\Omega$ , $\pm$ 5%, 1/4W
0633	53110303E	Hexagon nut x 2	R917-R918	RT0512314	Carbon, 12K $\Omega$ , $\pm$ 5%, 1/4W
			R919-R920	GT0582412	Carbon, 820K $\Omega$ , $\pm$ 5%, 1/2W
			R921-R922	RT1033214	Carbon, 3.3K $\Omega$ , $\pm$ 10%, 1/4W
			R923-R924	GT0539412	Carbon, 390K $\Omega$ , $\pm$ 5%, 1/2W
			R925-R926	GT0568312	Carbon, 68K $\Omega$ , $\pm$ 5%, 1/2W
			R927-R928	RT1018214	Carbon, 1.8K $\Omega$ , $\pm$ 10%, 1/4W
			R929-R930	RT0510314	Carbon, 10K $\Omega$ , $\pm$ 5%, 1/4W
			R931	RT1010114	Carbon, 100 $\Omega$ , $\pm$ 10%, 1/4W
			R932-R933	RT1033514	Carbon, 3.3M $\Omega$ , $\pm$ 10%, 1/4W
			R934-R935	RT0582314	Carbon, 82K $\Omega$ , $\pm$ 5%, 1/4W
					<b>CAPACITORS</b>
			C901-C902	EV1050251	Elect., 1 $\mu$ F, +40%, -20%, 25V
			C903-C904	DD1650001	Ceramic, 50pF, $\pm$ 10%, 50V
			C905-C906	EV2260061	Elect., 22 $\mu$ F, 6V
			C907-C908	DF5412201	Mylar, 1200pF, $\pm$ 2%, 50V
			C909-C910	EA4760169	Elect., 47 $\mu$ F, 16V
			C911-C912	DF5547201	Mylar, 4700pF, $\pm$ 5%, 25V
			C913-C914	DD1615001	Ceramic, 15pF, $\pm$ 10%, 50V
			C915-C916	DD1650001	Ceramic, 50pF, $\pm$ 10%, 50V
			C917-C918	DF1747401	Mylar, 0.47 $\mu$ F, $\pm$ 20%, 50V
			C919	EA1070509	Elect., 100 $\mu$ F, 50V
			C920-C921	EF6524150	Mylar, 240pF, $\pm$ 5%, 125V
			C922-C923	DD1610101	Ceramic, 100pF, $\pm$ 10%, 50V
			C924-C925	DF1747401	Mylar, 0.47 $\mu$ F, $\pm$ 20%, 50V
			C926-C927	DD1650001	Ceramic, 50pF, $\pm$ 10%, 50V
			C928-C929	DD1610101	Ceramic, 100pF, $\pm$ 10%, 50V
					<b>SEMICONDUCTORS</b>
			H901-H904	HT310002A	Transistor, 2SC1000 Gr BL
			H905-H906	HT304580R	Transistor, 2SC458LGA (B)
					<b>MISCELLANEOUS</b>
			J901-J917	YP1000099	Plug
			P400	YD2577004 (ZZ2577004)	P. C. Board P. C. Board Assembly
					<b>RESISTORS</b>
			R401-R402	RT1039114	Carbon, 390 $\Omega$ , $\pm$ 10%, 1/4W
			R403-R404	RN1015414	Carbon, 150K $\Omega$ , $\pm$ 10%, 1/4W
			R405-R406	RN1010414	Carbon, 100K $\Omega$ , $\pm$ 10%, 1/4W
			R407-R408	RN1022314	Carbon, 22K $\Omega$ , $\pm$ 10%, 1/4W
			R409-R410	RN1027314	Carbon, 27K $\Omega$ , $\pm$ 10%, 1/4W
			R411-R412	RT0520214	Carbon, 2K $\Omega$ , $\pm$ 5%, 1/4W
			R413-R414	RT1010214	Carbon, 1K $\Omega$ , $\pm$ 10%, 1/4W
			R415-R416	RT0510314	Carbon, 10K $\Omega$ , $\pm$ 5%, 1/4W
			R422-R423	RN1022514	Carbon, 2.2M $\Omega$ , $\pm$ 10%, 1/4W
			R424-R425	RN1068314	Carbon, 68K $\Omega$ , $\pm$ 10%, 1/4W
P900	YD2821008 (ZZ2821008)	P. C. Board P. C. Board Assembly			
		<b>RESISTORS</b>			
R901-R902	RT0547314	Carbon, 47K $\Omega$ , $\pm$ 5%, 1/4W			
R903-R904	RT1047114	Carbon, 470 $\Omega$ , $\pm$ 10%, 1/4W			
R905-R906	RT0582114	Carbon, 820 $\Omega$ , $\pm$ 5%, 1/4W			

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R426-R429	RN1010314	Carbon, 10K $\Omega$ , $\pm$ 10%, 1/4W	R307-R308	RT0547214	Carbon, 4.7K $\Omega$ , $\pm$ 5%, 1/4W
R430-R431	RT0522114	Carbon, 220 $\Omega$ , $\pm$ 5%, 1/4W	R309-R310	RT1022514	Carbon, 2.2M $\Omega$ , $\pm$ 10%, 1/4W
			R311-R312	RJ1010102	Metal Oxid 100 $\Omega$ , $\pm$ 10%, 2W
		CAPACITORS			CAPACITORS
C401-C402	DF1722402	Mylar, 0.22 $\mu$ F, $\pm$ 20%, 50V	C301-C302	DF1647301	Mylar, 0.047 $\mu$ F, $\pm$ 10%, 50V
C403-C404	EV1050251	Elect., 1 $\mu$ F, +40%, -20%, 25V	C303-C304	DF1668201	Mylar, 0.0068 $\mu$ F, $\pm$ 10%, 50V
C405-C406	EA1060359	Elect., 10 $\mu$ F, 35V			MISCELLANEOUS
C407-C408	EV3300251	Elect., 3.3 $\mu$ F, +40%, -20%, 25V	S301	SP0404002	Push Switch
C409	EA1070359	Elect., 100 $\mu$ F, 35V	J301-J308	YP1000099	Plug
C410-C411	EV3350251	Elect., 3.3 $\mu$ F, +40%, -20%, 25V			
C414-C415	EV1050351	Elect., 1 $\mu$ F, +40%, -20%, 35V	P600	YD2828003 (ZZ2828003)	P. C. Board P. C. Board Assembly
C416-C417	EV4740251	Elect., 0.47 $\mu$ F, +40%, -20%, 25V			RESISTORS
C419	DD1650001	Ceramic, 50pF, $\pm$ 10%	R601-R602	RT0510314	Carbon, 10K $\Omega$ , $\pm$ 5%, 1/4W
C420-C421	DD1620001	Ceramic, 20pF, $\pm$ 10%	R603-R604	RT0510414	Carbon, 100K $\Omega$ , $\pm$ 5%, 1/4W
		SEMICONDUCTORS	R605-R606	RT1010214	Carbon, 1K $\Omega$ , $\pm$ 10%, 1/4W
H401-H402	HT310002A	Transistor, 2SC1000 (GR or BL)	R607-R608	RT1047214	Carbon, 4.7K $\Omega$ , $\pm$ 10%, 1/4W
H403-H404	HT104932A	Transistor, 2SA493 (Y or GR)			CAPACITORS
H405-H406	HT310002A	Transistor, 2SC1000 (GR or BL)	C601-C602	DF1733301	Mylar, 0.033 $\mu$ F, $\pm$ 20%, 50V
H407-H408	HT104932A	Transistor, 2SA493 (Y or GR)	C603-C604	DD1510101	Ceramic, 100pF, $\pm$ 5%
		MISCELLANEOUS			MISCELLANEOUS
J401-J408	YP1000036	Plug	S601	SP0204003	Push Switch
J410-J413	YP1000036	Plug	J601-J608	YP1000099	Plug
J415	YP1000036	Plug			
J417-J418	YP1000036	Plug	P700	YD2821007 (ZZ2821007)	P. C. Board P. C. Board Assembly
J420	YP1000036	Plug			RESISTORS
P450	YD2828001 (ZZ2828001)	P. C. Board P. C. Board Assembly	R701-R702	RT1010214	Carbon, 1K $\Omega$ , $\pm$ 10%, 1/4W
		RESISTORS	R703-R704	RN1047414	Carbon, 470K $\Omega$ , $\pm$ 10%, 1/4W
R451-R454	RT0510314	Carbon, 10K $\Omega$ , $\pm$ 5%, 1/4W	R705-R706	RN1056314	Carbon, 56K $\Omega$ , $\pm$ 10%, 1/4W
R456	RT0527314	Carbon, 27K $\Omega$ , $\pm$ 5%, 1/4W	R707-R708	RC1018312	Solid, 18K $\Omega$ , $\pm$ 10%, 1/2W
R457-R460	RT0556214	Carbon, 5.6K, $\pm$ 5%, 1/4W	R709-R710	RT1039214	Carbon, 3.9K $\Omega$ , $\pm$ 10%, 1/4W
R461-R462	RT0527314	Carbon 27K $\Omega$ , $\pm$ 5%, 1/4W	R711-R712	GT0515112	Carbon, 150 $\Omega$ , $\pm$ 5%, 1/2W
R463-R466	RT0556214	Carbon, 5.6K $\Omega$ , $\pm$ 5%, 1/4W	R713-R714	RC1033212	Solid, 3.3K $\Omega$ , $\pm$ 10%, 1/2W
R467-R468	RT0515414	Carbon, 150K $\Omega$ , $\pm$ 5%, 1/4W	R715-R716	GT0524212	Carbon, 2.4K $\Omega$ , $\pm$ 5%, 1/2W
R469-R471	RM0104005	Variable, 100K $\Omega$ (B)	R717-R718	RN1015414	Carbon, 150K $\Omega$ , $\pm$ 10%, 1/4W
		CAPACITORS	R719-R720	RT1010314	Carbon, 10K $\Omega$ , $\pm$ 10%, 1/4W
C451-C454	DF1622301	Mylar, 0.022 $\mu$ F, $\pm$ 10%, 50V	R721-R722	RC1022212	Solid, 2.2K $\Omega$ , $\pm$ 10%, 1/2W
C455-C456	DK1668201	Ceramic, 0.0068 $\mu$ F, $\pm$ 10%, 50V	R723-R724	RA0104012	Trimmer, 100K $\Omega$ , $\pm$ 25%
C457-C458	DK1610301	Ceramic, 0.01 $\mu$ F, $\pm$ 10%, 50V	R725-R726	RC1033012	Solid, 33 $\Omega$ , $\pm$ 10%, 1/2W
C459-C460	DD1510101	Ceramic, 100pF, $\pm$ 5%, 50V	R727-R728	RC1082212	Solid, 8.2K $\Omega$ , $\pm$ 10%, 1/2W
C461-C462	DK1622201	Ceramic, 0.0022 $\mu$ F, $\pm$ 10%, 50V	R729-R730	RA0501005	Trimmer, 470 $\Omega$ , $\pm$ 25%
		MISCELLANEOUS	R731-R734	RC1047112	Solid, 470 $\Omega$ , $\pm$ 10%, 1/2W
J451-J456	YP1000099	Plug	R735-R736	RC1010012	Solid, 10 $\Omega$ , $\pm$ 10%, 1/2W
P300	YD2828002 (ZZ2828002)	P. C. Board P. C. Board Assembly	R737-R740	RC1022112	Solid, 220 $\Omega$ , $\pm$ 10%, 1/2W
		RESISTORS	R741-R742	RC1039112	Solid, 390 $\Omega$ , $\pm$ 10%, 1/2W
R301-R302	RT1010514	Carbon, 1M $\Omega$ , $\pm$ 10%, 1/4W	R743-R744	RC1030012	Solid, 30 $\Omega$ , $\pm$ 10%, 1/2W
R303-R304	RT1022414	Carbon, 220K $\Omega$ , $\pm$ 10%, 1/4W	R745-R746	RC1039112	Solid, 390 $\Omega$ , $\pm$ 10%, 1/2W
R305-R306	RT0510414	Carbon, 100K $\Omega$ , $\pm$ 5%, 1/4W	R747-R750	GW1024202	Wire Wound, 0.24 $\Omega$ , $\pm$ 10%, 2W

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R753-R754	GT0510002	Carbon, 10Ω, ±5%, 2W	J006	YT0204003	Terminal, 4P (Pre OUT-Main IN)
R755-R756	RC1039312	Solid, 39KΩ, ±10%, 1/2W	J007	YL0301021	Terminal, Ground
R757-R758	RC1027312	Solid, 27KΩ, ±10%, 1/2W	J008	YJ0100055	Jack, Headphone
R759-R760	RC1082212	Solid, 8.2KΩ, ±10%, 1/2W	J010	YT0304002	Terminal
R761-R762	RT1010114	Carbon, 100Ω, ±10%, 1/4W	J011	YL0106004	Terminal, AC Line Voltage Select
CAPACITORS			J012-J013	YL0105002	Terminal, 5P
C701-C702	EV4740251	Elect., 0.47μF, +40%, -20%, 25V	J014	YL0105004	Terminal, 5P
C703-C704	EA4760509	Elect., 47μF, 50V	J016	YJ0400018	Jack, AC Outlet
C707-C710	EA4760509	Elect., 47μF, 50V	J017	YJ0800012	Jack, Fuse Holder
C711-C712	EV1050351	Elect., 1μF, 35V	J018	YJ0200007	Socket
C713-C714	DD1650001	Ceramic, 50pF, ±10%	J019-J020	YP1000097	Plug, Pre Out Main In
C717-C718	EA2260359	Elect., 22μF, 35V	J021-J024	YJ0500013	Socket for Power Transistor
C719-C722	DD1650001	Ceramic, 50pF, ±10%, 50V	J028	YL0107005	Terminal, 7P
C725-C726	DF1710452	Mylar, 0.1μF, 200V	RESISTORS		
C727-C728	DD1710101	Ceramic, 100pF, ±10%	R001	RM0254019	Variable, 250KΩ (HB)
C729-C730	DF3610152	Mylar, 100pF, ±10%	R002	RM0254021	Variable, 250KΩ (A)
SEMICONDUCTORS			R003-R004	RT1039414	Carbon, 390KΩ, ±10%, 1/4W
H701-H702	HT309452A	Transistor, 2SC945Q, R	R005-R006	RT1010414	Carbon, 100KΩ, ±10%, 1/4W
H703-H704	HT309602A	Transistor, 2SC960M, L	R007-R008	RT1022414	Carbon, 220KΩ, ±10%, 1/4W
H705-H706	HT303711B	Transistor, 2SC371Y	R009-R010	RJ1047002	Metal Oxid, 47Ω, ±10%, 2W
H707-H708	HT105621B	Transistor, 2SA562Y	R011	GT0522501	Carbon, 2.2MΩ, ±5%, 1W
H709-H712	HK060619A	Transistor Kit, 2SA606 2SC959 N.M.	R013	RC1002212	Solid, 2.2Ω, ±10%, 1/2W
H713-H714	HV0000705	Varistor, S3D16R	CAPACITORS		
H715-H718	HD1000105	Diode, 1N60	C001-C002	DK1710301	Ceramic, 0.01μF, 50V, YY
MISCELLANEOUS			C003	EC4780802	Elect., 4700μF, 80V
J701-J726	YP1000099	Plug	C004-C005	DO0720350	Oil Paper, 0.02μF, ±20%, 600V, DC
P800	YD2828004 (ZZ2828004)	P. C. Board P. C. Board Assembly	C006-C007	EC3080552	Elect., 3000μF, +150%, -10%, 55V
RESISTORS			C008	DO0733380	Oil Paper 0.033μF, ±20%, 800V, AC
R801	RC1047012	Solid, 47Ω, ±10%, 1/2W	SEMICONDUCTORS		
R802	RC1082212	Solid, 8.2KΩ, ±10%, 1/2W	H001-H004	HK021719A	Transistor Kit, 2SD217 x 2 IL, IM
R803	RC1033312	Solid, 33KΩ, ±10%, 1/2W	H005-H006	HV0000212	Varistor, SV-3A
R804	RC1047112	Solid, 470Ω, ±10%, 1/2W	H007	HD2000510	Diode, 5B2
R805	RC1012212	Solid, 1.2KΩ, ±10%, 1/2W	MISCELLANEOUS		
CAPACITORS			S001	SR1006007	Rotary Switch
C801-C802	DK1810351	Ceramic, 0.01μF, +100%, -0%, 500V	L001	TS1960201	Power Transf.
C803	EB4770631	Elect., 470μF, 63V	M001	IN1008001	Lamp
C804	EA1070509	Elect., 100μF, 50V	F001	FS1025002	Fuse UL 2.5A
C805	EA3370509	Elect., 330μF, 50V	W001	YC0240010	AC Cord
C806	EA1070509	Elect., 100μF, 50V	W002-W004	YB0027001	Connective Cord for AC Line
SEMICONDUCTORS			W005-W006	YX2828001	Wire Material
H801	HT312132A	Transistor, 2SC1213A, B, C	L002	LL2291512	Choke Coil
H802-H803	HD2000413	Diode, SIB-01-02	L003	LL2291512	Choke Coil
MISCELLANEOUS			S002	SP0201010	Push Switch
J801-J808	YP1000099	Plug			
J001-J002	YJ0100055	Jack, Mic/Aux2 IN			

## SPECIFICATIONS

Gain—Phono (low level) to pre-amp output	.55 dB
Phono to recording output	.40 dB
High level to pre-amp output	.15 dB
Input Impedance—Low level input	Phono 47K Microphone 47K
High level input	100K
Input Sensitivity—Phono (low)	1.8mV to equal 1 volt output at pre-amp out
Frequency Response	±1.0 dB, 20 Hz to 20 KHz at rated power output
Intermodulation Distortion	Less than 0.5% at rated power output from 20 Hz to 20 KHz with both channels driven (S.M.P.T.E.)
Total Harmonic Distortion	Less than 0.5% at rated power output 20 Hz to 20 KHz with both channels driven
Damping Factor (20 to 20 KHz)	Greater than 45 into 8 ohms load
Total Noise—From magnetic phono input to power amp output	Less than 1.5 $\mu$ V equivalent input at rated output into 8 ohms
Volume Tracking	Within 3 dB
Rated continuous (R M S) Output Per channel, both channels operating simultaneously	30 watts at 4 and 8 ohms 20 watts at 16 ohms
Comparable Total Music Power (IHF)	90 watts at 8 ohms
Power Requirement	100/120/200/220/240V AC 50 to 60Hz
At rated output both channels operating	190 watts
Idling Power (volume control at zero)	48 watts
Dimensions—Panel width	14-11/64 inches
Panel Height	4-23/32 inches
Depth	11-1/32 inches
Weight—Unit alone	18 lbs
Packed for shipment	25.3 lbs

\* These specifications and exterior designs may be changed for improvement without advance notice.