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SERVICE MANUAL 4140

**marantz**

model 4140

*Stereo 2 + Quadradial 4  
Console Amplifier*

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## INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model 4140 Solid-State Quadradial Console Amplifier.

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

## 1. SERVICE NOTES

As can be seen from the circuit diagram the chassis of Model 4140 consists of the following units. Each unit mounted on a printed circuit board is described within the square enclosed by a bold dotted line on the circuit diagram.

- |   |                             |
|---|-----------------------------|
| 1. Tape Moni., High Filter Unit .....     | mounted on P.W. Board, P250 |
| 2. Phono Equalizer Amplifier .....        | mounted on P.W. Board, P300 |
| 3. Loudness Unit .....                    | mounted on P.W. Board, P350 |
| 4. Vari-Matrix Unit .....                 | mounted on P.W. Board, P500 |
| 5. Meter Rectifier Unit .....             | mounted on P.W. Board, P550 |
| 6. Temperature Compensation Unit .....    | mounted on P.W. Board, P580 |
| 7. Power Amplifier .....                  | mounted on P.W. Board, P600 |
| 8. Function Indicator Unit .....          | mounted on P.W. Board, P650 |
| 9. Power Supply .....                     | mounted on P.W. Board, P800 |
| 10. AC Rectifier .....                    | mounted on P.W. Board, P850 |
| 11. Balance Variable Resistor Unit .....  | mounted on P.W. Board, P900 |
| 12. Buffer., Pre-Amplifier .....          | mounted on P.W. Board, PE01 |
| 13. Tone Amplifier .....                  | mounted on P.W. Board, PD01 |
| 14. Main-Remote Speaker Switch Unit ..... | mounted on P.W. Board, PL01 |
| 15. Tone Control Unit .....               | mounted on P.W. Board, PJ01 |

## 2. SELECTOR SWITCH

Signals from the PHONO jacks are applied to the phono-amplifiers and equalized to match the RIAA curve for flat frequency response.

The outputs of the phono-amplifiers and signals from the TUNER, CD-4/AUX and TAPE MONITOR IN jacks are led to the SELECTOR switch, S001. The SELECTOR switch selects one set of signals from PHONO, TUNER, CD-4/AUX and TAPE MONITOR IN jacks and sends them to the MONITOR switch and TAPE MONITOR OUT jacks. The selected signals are then applied to the MODE switch, S002.

PHONO and TUNER jacks are for 2-channel input signals, that is stereo signals. CD-4/AUX, TAPE MONITOR IN and TAPE MONITOR OUT jacks are 4-channel, that is quadraphonic signal

## 3. MODE SWITCH

MODE switch S002 has positions of MONO, 2 CH, DISCRETE, VARI-MATRIX and SQ DECODER.

In the MONO position all input signals are mixed together and delivered to all four channels.

In the 2 CH position stereo signals are directly routed to the pair of front left (LF) and front right (RF) channels; the same signals at the LF and RF channels are fed to the rear left (LR) and rear right (RR) channels, respectively. When quadraphonic signals are applied to the input terminals, the LF and LR signals and RF and RR signals are separately added, thus the (LF + LR) signal is delivered to the LF and LR channels and the (RF + RR) signal is delivered to the RF and RR channels.

In the DISCRETE position the quadraphonic input signals are separately routed as 4-channel stereophonic signals to each channel. At this position, for ordinary stereo input signals, neither LR nor RR channels no signal to carry.

In the VARI-MATRIX position, 2-channel stereo input signals are converted into quadraphonic signals through the vari-matrix circuit; the input right and left channel signals are fed directly to the LF and RF channels, while the signals to the LR and RR channels are synthesized from the 2-channel input signals under the control of the DIMENSION control.

The LR and RR channel signal components are controlled by the DIMENSION control as shown below.

DIMENSION control setting	LR output	RR output
Bottom	LF + RF	RF + LF
Center	LF	RF
Top	LF - RF	RF - LF

When the DIMENSION control is set at the bottom the LR and RR channel signals become manaural, at the center are stereophonic, and at the top are out of phase, thus providing vanished sound image positioning.

In the SQ DECODER position, "compatible stereo-quadraphonic (SQ) record" developed by CBS is ideally decoded into 4-channel signals. This requires incorporation of the adapter, Model SQA-1, into the set.

When the MONITOR switch is set to the ON position, signals from the TAPE MONITOR OUT terminals are in discrete mode regardless of the MODE switch setting. In the OFF position, the signals are processed into the mode indicated by the MODE switch in the MONO, 2 CH, or DISCRETE position of the MODE switch, while signals remain in discrete mode in the VARI-MATRIX and SQ DECODER positions.

**4. BUFFER AMPLIFIER**

Signals passed through the MODE switch are then low-impedance-transferred through the buffer amplifier, thus obtained low-impedance outputs are then led to the balance and volume circuits.

**5. BALANCE CONTROL**

Signals passed through the buffer amplifiers go into the balance control circuits, in which the signals are controlled by three balancers: the FRONT L-R, REAR L-R, and FRONT-REAR. By setting the FRONT-REAR balancer to the "FRONT" side and the FRONT L-R balancer to the "L" side, for example, only the front left (LF) channel is driven.

**6. PRE-AMPLIFIER**

Signals passed through the balance and volume control circuits are led to the tone control circuits. Hi and low frequency response can be varied with the BASS, MID and TREBLE controls. These controls permit separate adjustment of front stereo pair of channels (LF, RF) and rear stereo pair of channels (LR, RR).

**7. MAIN AMPLIFIER**

The output signals from pre-amplifier are led to the main amplifier through the highcut filter circuit. The transistors H601 and H603 from a differential amplifier, directly coupled to the transistor H605.

The transistor H605 drives the inverters H611 and H613 which, in turn, drive the power stage consisting of H001 and H002. Transistors H607 and H609 compose a protection circuit.

The protection circuit will operate when an excessive current flows into the power transistor,

to limit current or to control the power transistors so that do not operate beyond the safety area.

In case either excessive current flows, or the load becomes almost entirely reactive, in the power stage, the transistors H607 and H609 and the diodes H622 and H624 are operated through the resistors R642 and R644, so that the power transistors are protected from damage.

## 8. BTL (Balanced Transformerless) CONNECTION

This power amplifier is designed to operate in either 2-channel or 4-channel modes, depending on the setting of the POWER MODE switch that incorporates phase-conversion and power switch for BTL connection.

With this switch placed in the 25Wx4 position, this unit operates as a 25W 4 channel amplifier. With the switch placed in the 70Wx2 position, the unit operate as a 70W 2 channel amplifier, in which case, the power output is obtained only from FRONT SPK terminals.

The transistor H626 convert the phase of channel-1 amplifier and channel-3 amplifier.

## 9. POWER SUPPLY UNIT

The power supply unit consisting of the transistors H801 and H802, operating as an automatic voltage regulator, provides +35V DC to all the amplifiers except the main amplifier.

The transistors H803, H804 and H805 operate the relay L801 that protects speakers from destruction, and has a time lag of from three to five seconds, for other transistors to work stably.

## 10. TROUBLE ANALYSIS

1. Excessive line consumption
  - a. Check for shorted H851 through H854, C003, C004.
  - b. Check for shorted transistor H001 through H008.  
Check L001 for short.
2. No line consumption or zero bias
  - a. Check line cord, fuse, shorted H581, H582.
  - b. Check for open rectifiers H851 through H854, or open L001.
3. Excessive hum and noise
  - a. Check filter capacitors C003, C004, H801, H802.
4. Parasitic oscillation
  - a. Check for defective C607, C608, C619, C620, C621, C622.

## 11. POWER AMPLIFIER ADJUSTMENT

1. Connect a VTVM between J629 and J613 and adjust the trimming resistor R628 until the VTVM reads 10mV DC. For the other channel, connect the VTVM between J630 and J614 and adjust the R629 for the same reading.
2. Connect a VTVM between J623 and J629 and adjust the trimming resistor R613 until the VTVM reads 0V DC. For the other channel, connect the VTVM between J623 and J630 and adjust the trimming resistor R614 for the same reading.

## 12. POWER SUPPLY ADJUSTMENT

Connect a VTVM between J802(-) and J804(+) and adjust R806 until the VTVM reads 35.0V under no signal condition.

## 13. METER ADJUSTMENT

1. Connect the audio oscillator to the AUX input, set audio oscillator frequency to 1KHz. Set SELECTOR switch to AUX.
2. With the distortion analyzer connected across the output load (8-ohm), set the analyzer on the 30V AC scale.

3. Apply the audio oscillator output until the distortion analyzer indicates 15V and adjust the trimming resistor R551 until the meter indicator reads +2.

#### 14. TEST EQUIPMENT REQUIRED FOR SERVICING

Table 1 lists the test equipment required for servicing the Model 4140 Solid-State Quadradial Console Amplifier.

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 trouble shooting.
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 1W)	Commercial Grade	Discharges power supply filter capacitors prior to disassembly or resistance measurements.
Output Load Resistor ( $8\Omega \pm 0.5\%$ , 100W)	Commercial Grade	Provides 8-ohm load for amplifier output termination.
Output Load Resistor ( $4\Omega \pm 0.5\%$ , 100W)	Commercial Grade	Provides 4-ohm load for amplifier output termination.

Table 1 Test Equipment Required for Servicing

## 15. PERFORMANCE VERIFICATION

### 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 4140 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 4140.
4. Remove the top cover.

#### C. Total Hum and Noise Test

1. With shorting plugs connected to the CD-4/AUX 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 CD-4/AUX and the MODE switch to DISCRETE.
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 2mV, refer to the trouble analysis section of this manual.

#### D. Maximum Power Output

1. Connect the audio oscillator to the CD-4/AUX input. Set audio oscillator frequency to 1 KHz. Set SELECTOR switch to CD-4/AUX.
2. With the distortion analyzer connected across the output load (8-ohm), set the analyzer on the 30 AC scale.
3. Turn the analyzer on and increase the audio oscillator output to 180mV, and verify the analyzer indicates more than 14.2V.

#### 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 10.9 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 0.3%.  
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 1KHz. 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 0.3%.
9. Repeat steps 7 and 8, changing frequency to 20Hz.  
Distortion should be no more than 0.3%.
10. Check for parasitic oscillators; there should be none.

**F. Channel Separation**

1. Set audio oscillator to 20KHz. Connect oscillator to front left channel CD-4/AUX input only, with shorting plug (10K ohm) in all other channels CD-4/AUX input. Connect distortion analyzer to front left channel speaker output terminals.
2. Adjust oscillator output until distortion analyzer indicates 0 dB (2.8V).
3. Measure RF, LR, RR channel output. Distortion analyzer should indicate -30 dB or less.
4. Repeat step 1 and 2 with substituted channel driving.
5. If indication is not less than -30dB, adjust input wires to preamp board until reading is -30dB or less.

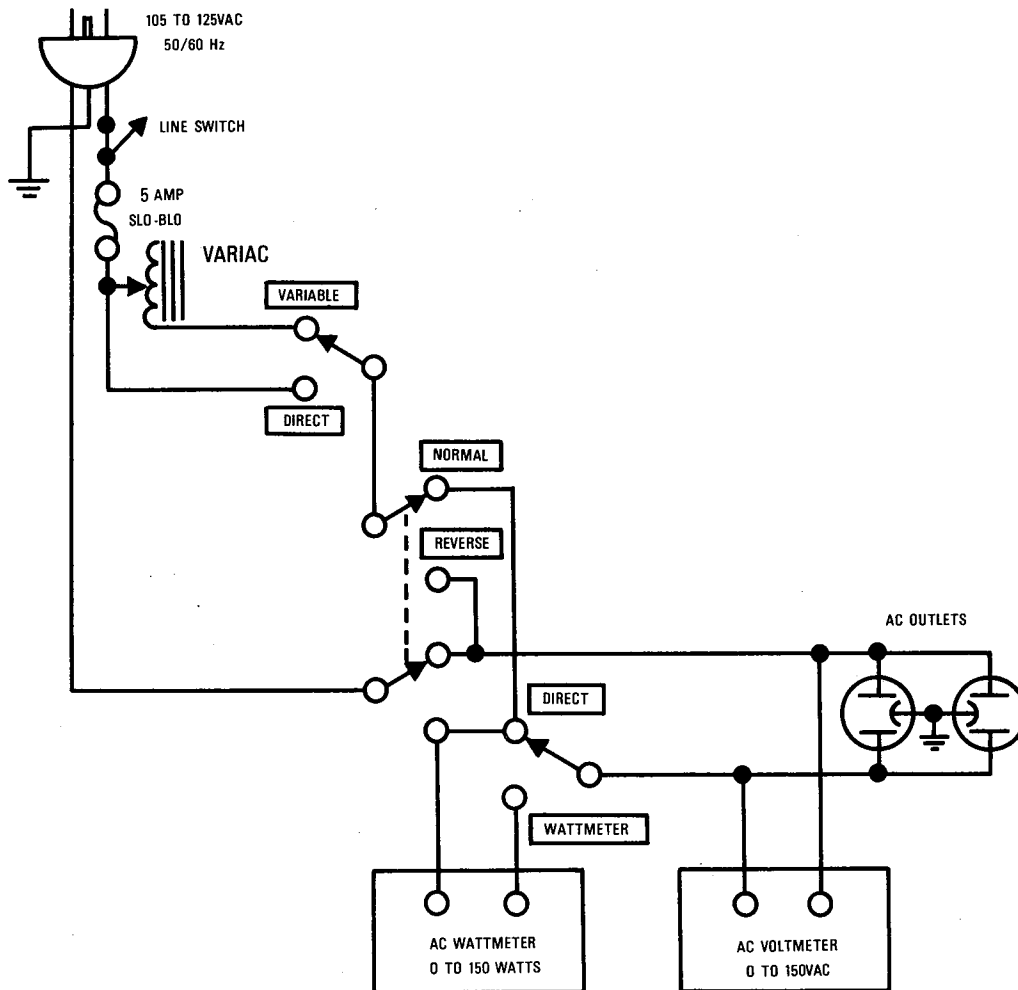


Figure 1. AC Power Control Box Simplified Schematic



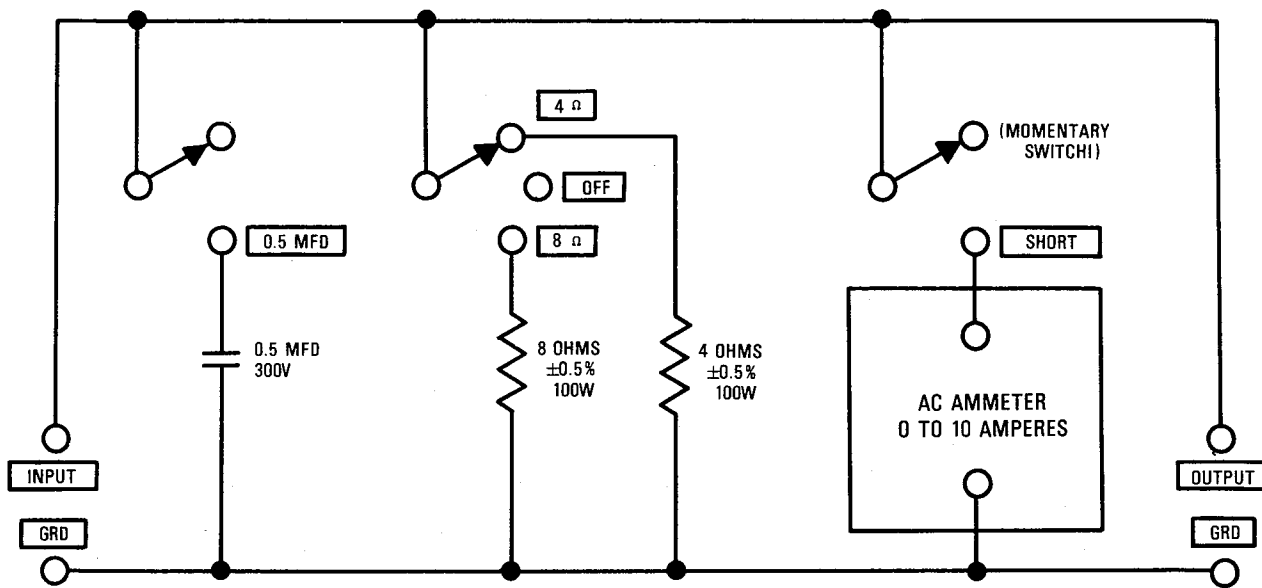


Figure 2. Amplifier Output Load Box Simplified Schematic

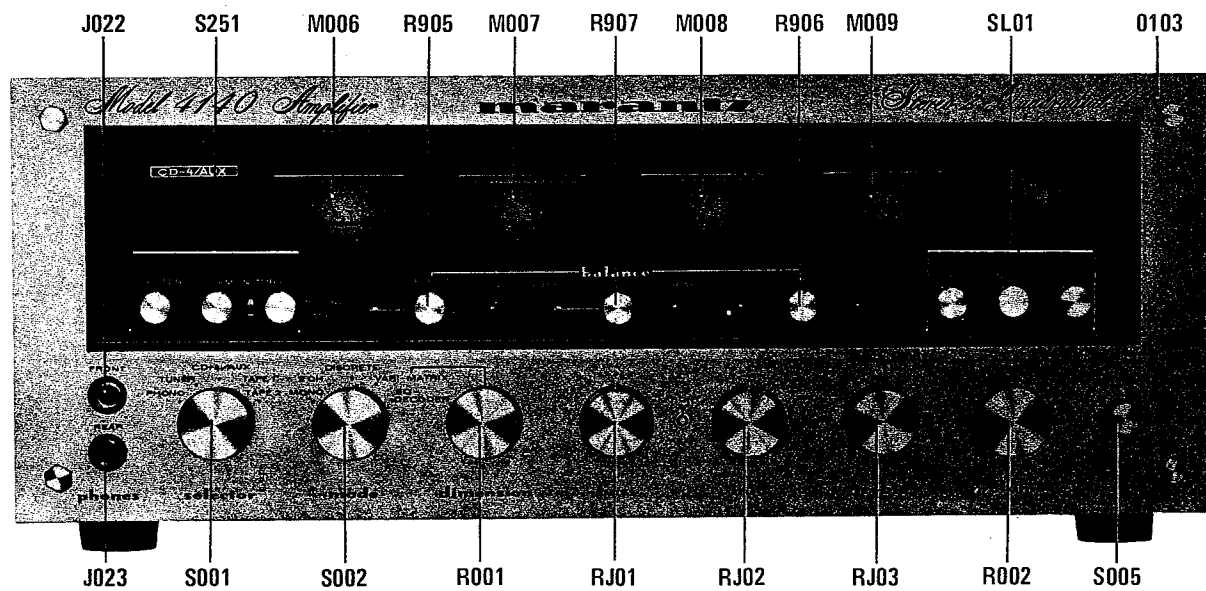


Figure 3. Front Panel Adjustment and Component Locations

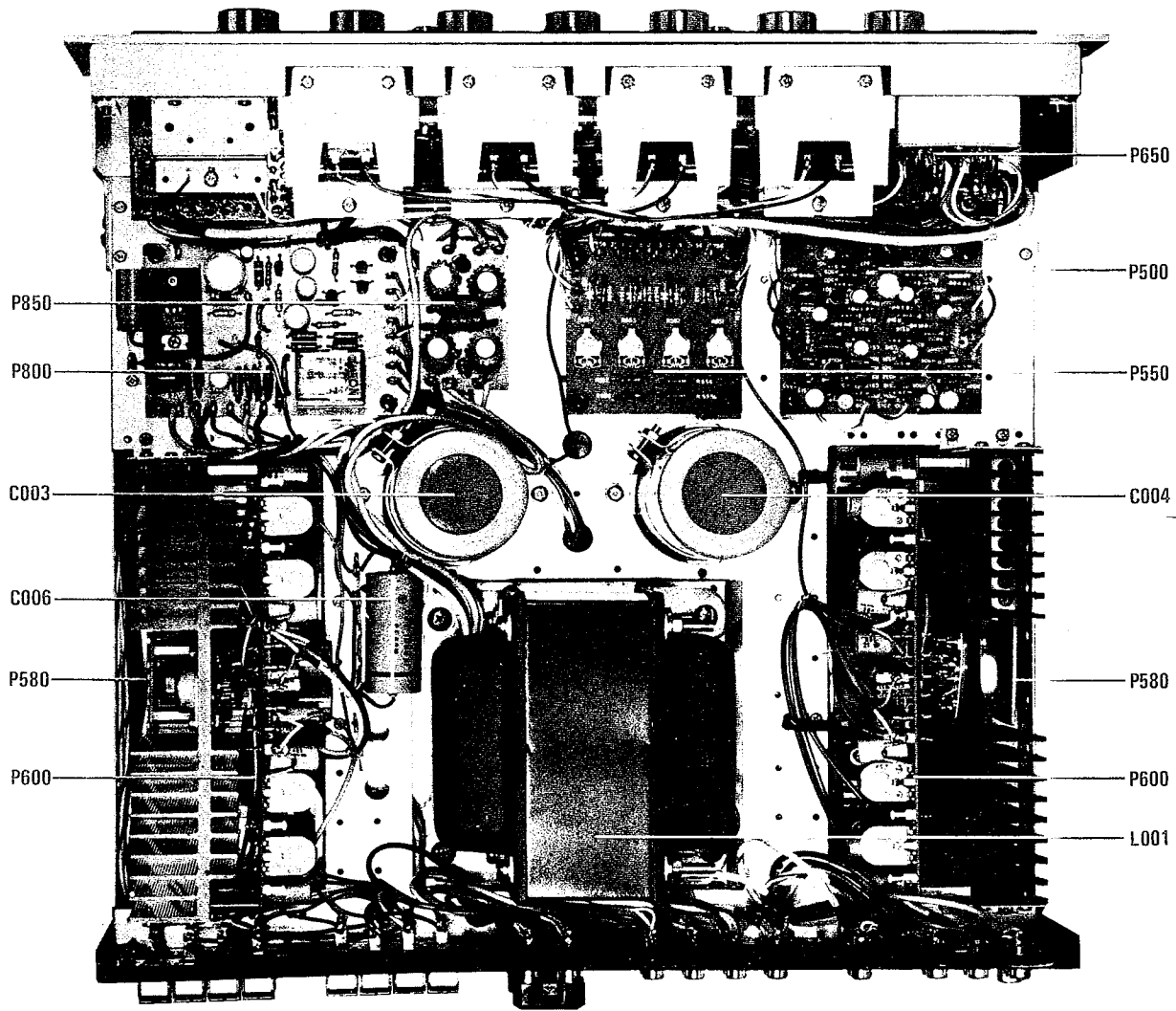


Figure 4. Main Chassis Component Locations (Top View)

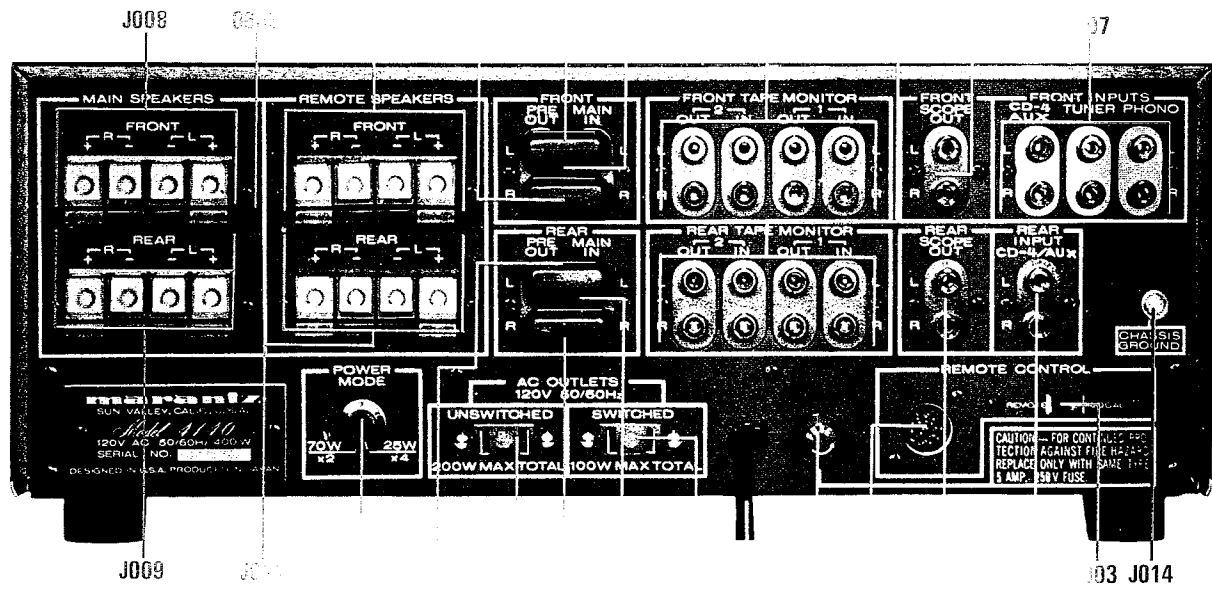


Figure 5. Rear Panel Adjustment and Component Locations

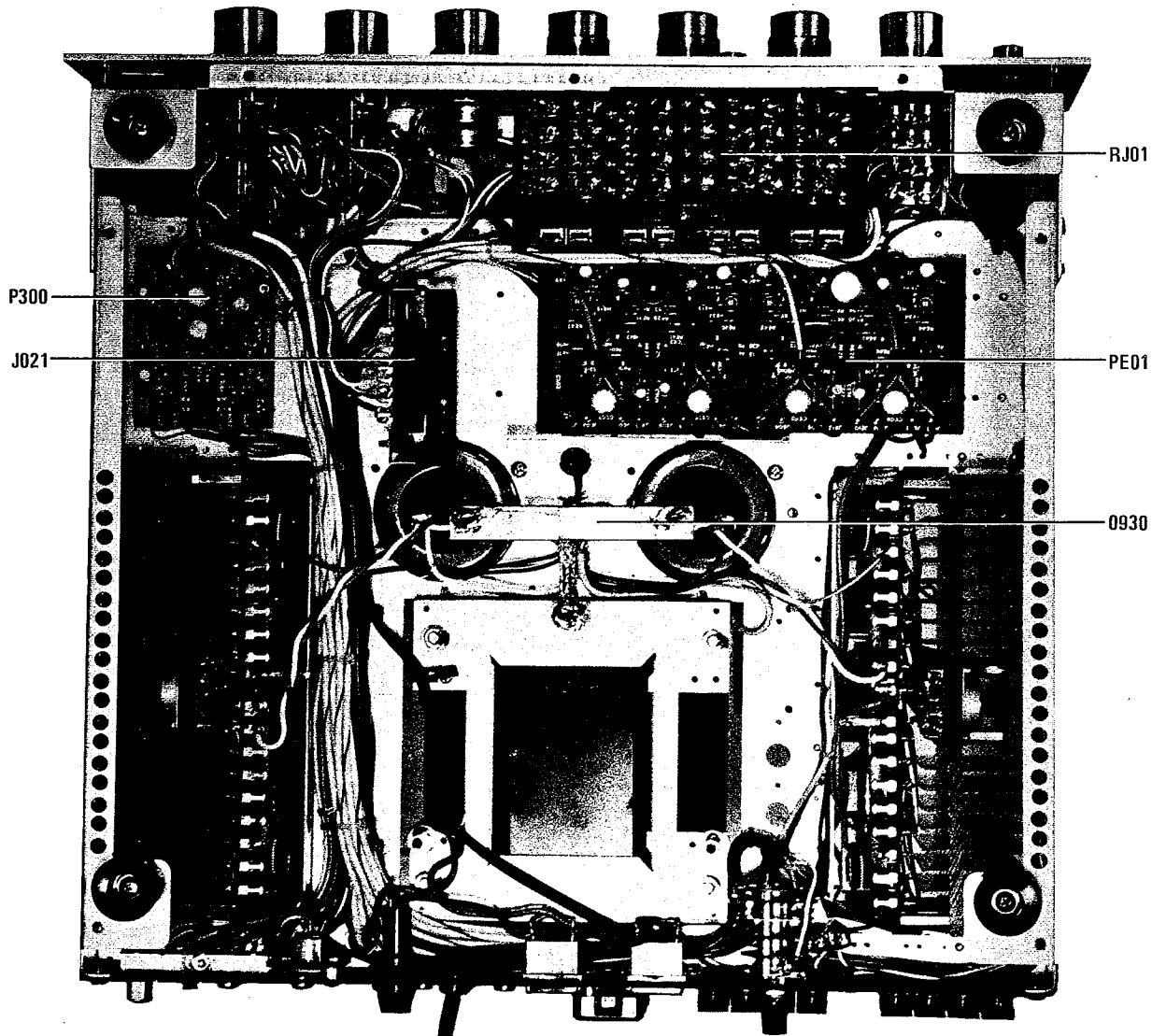


Figure 6. Main Chassis Component Locations (Bottom View)

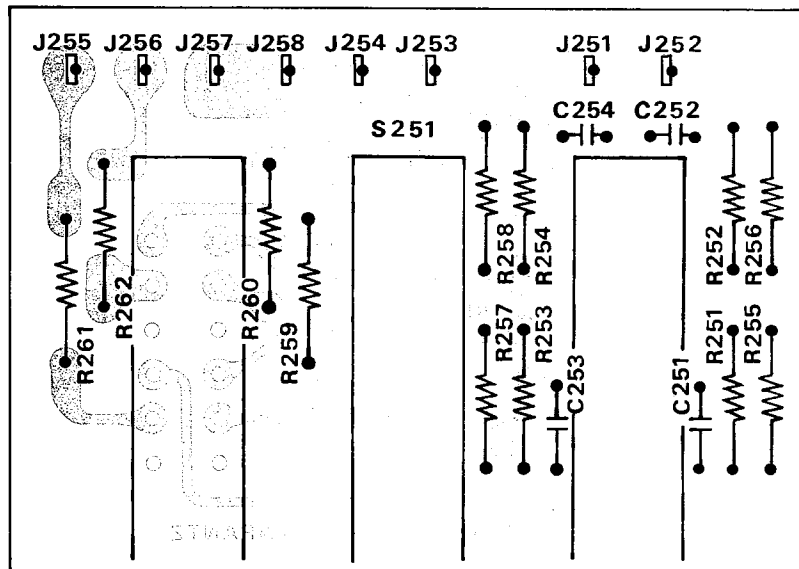


Figure 7. Tape Moni., Hi Filter Unit Assembly P250 Component Locations

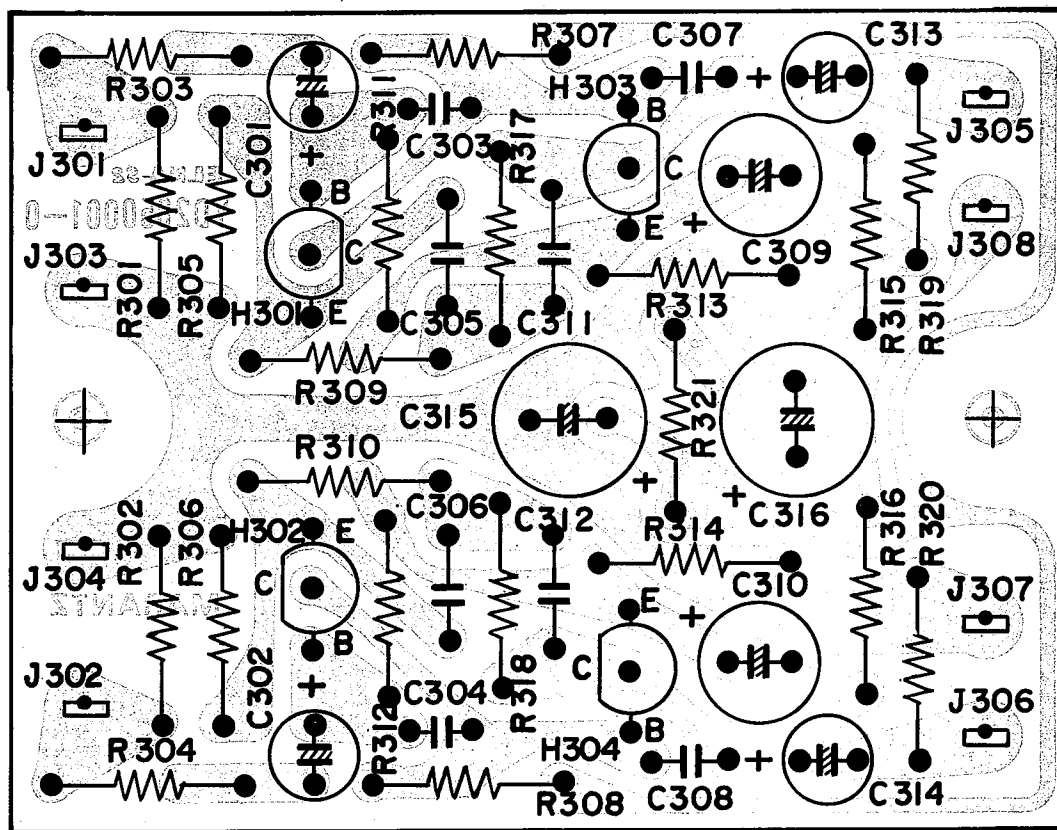


Figure 8. Phono Equalizer Amplifier Assembly P300 Component Locations

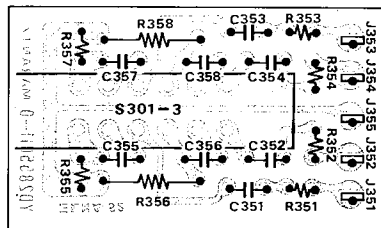


Figure 9. Loudness Unit Assembly P350 Component Locations

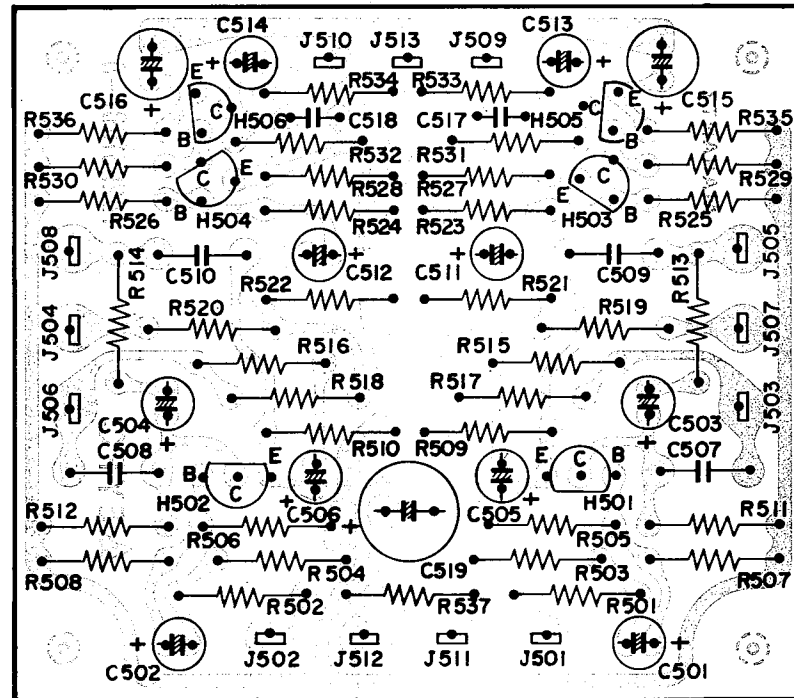


Figure 10. Vari-Matrix Unit Assembly P500 Component Locations

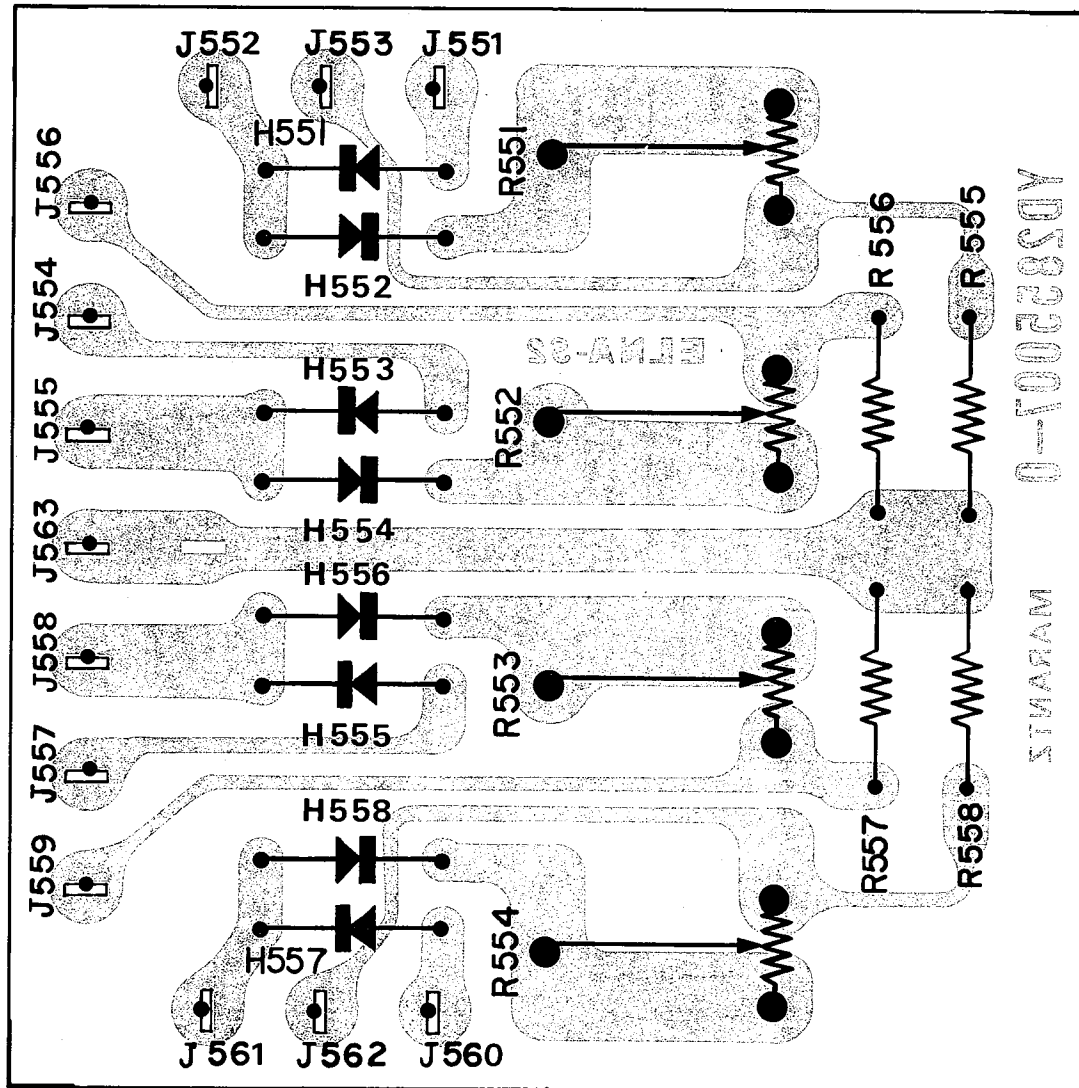


Figure 11. Meter Rectifier Unit Assembly P550 Component Locations

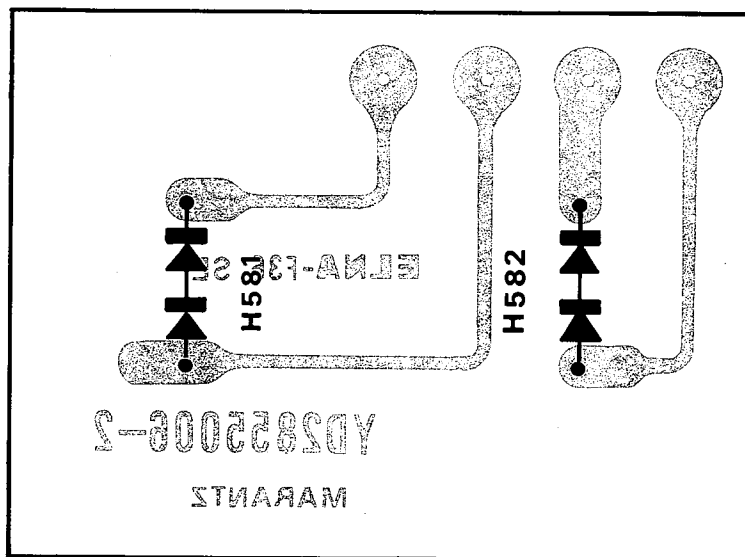


Figure 12. Temperature Compensation Unit Assembly P580 Component Locations

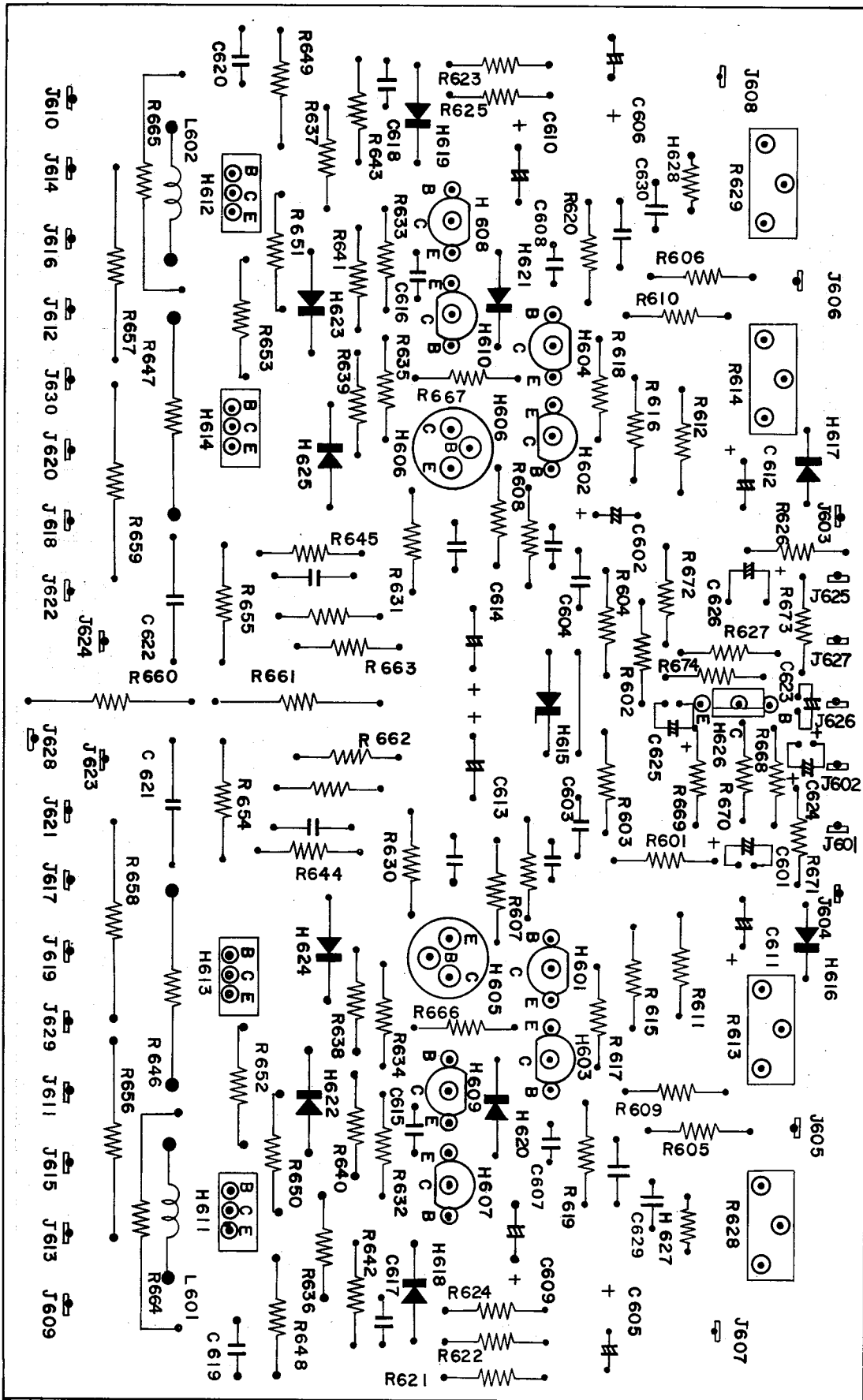


Figure 13. Power Amplifier Assembly P600 Component Locations

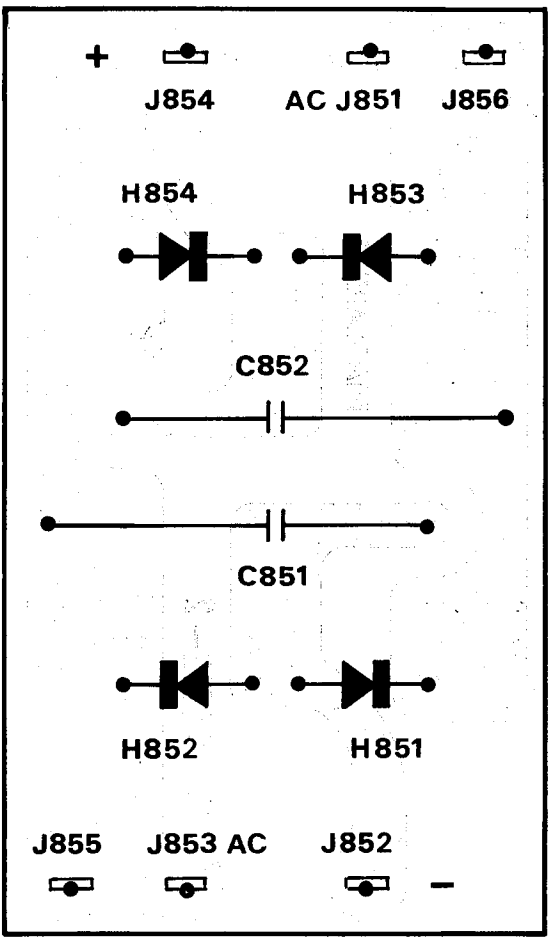


Figure 15. AC Rectifier Assembly P850 Component Locations

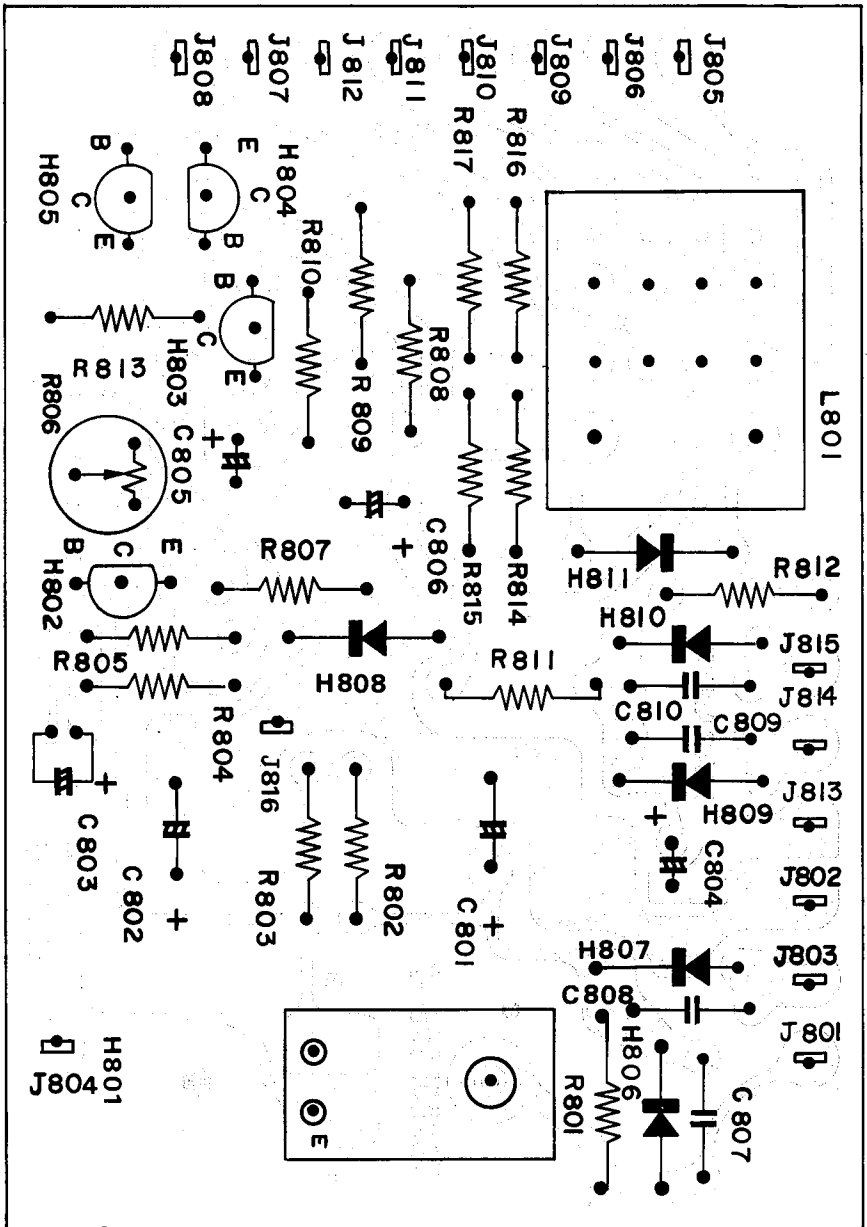


Figure 14. Power Supply Unit Assembly P800 Component Locations

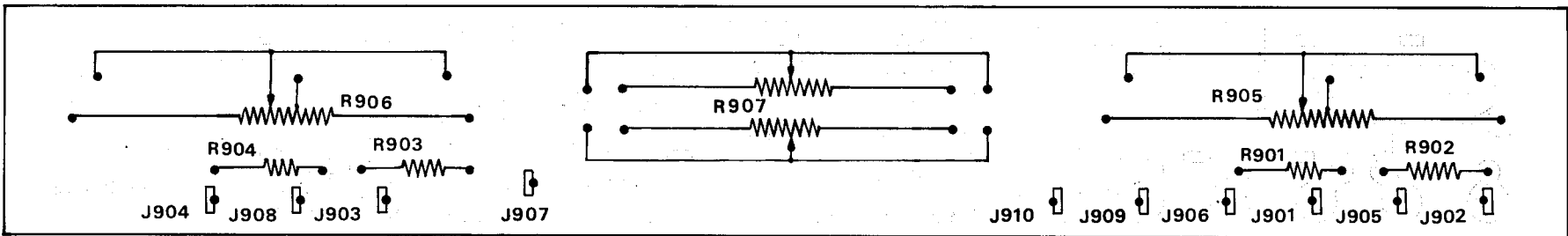


Figure 16. Balance Variable Resistor Unit Assembly P900 Component Locations

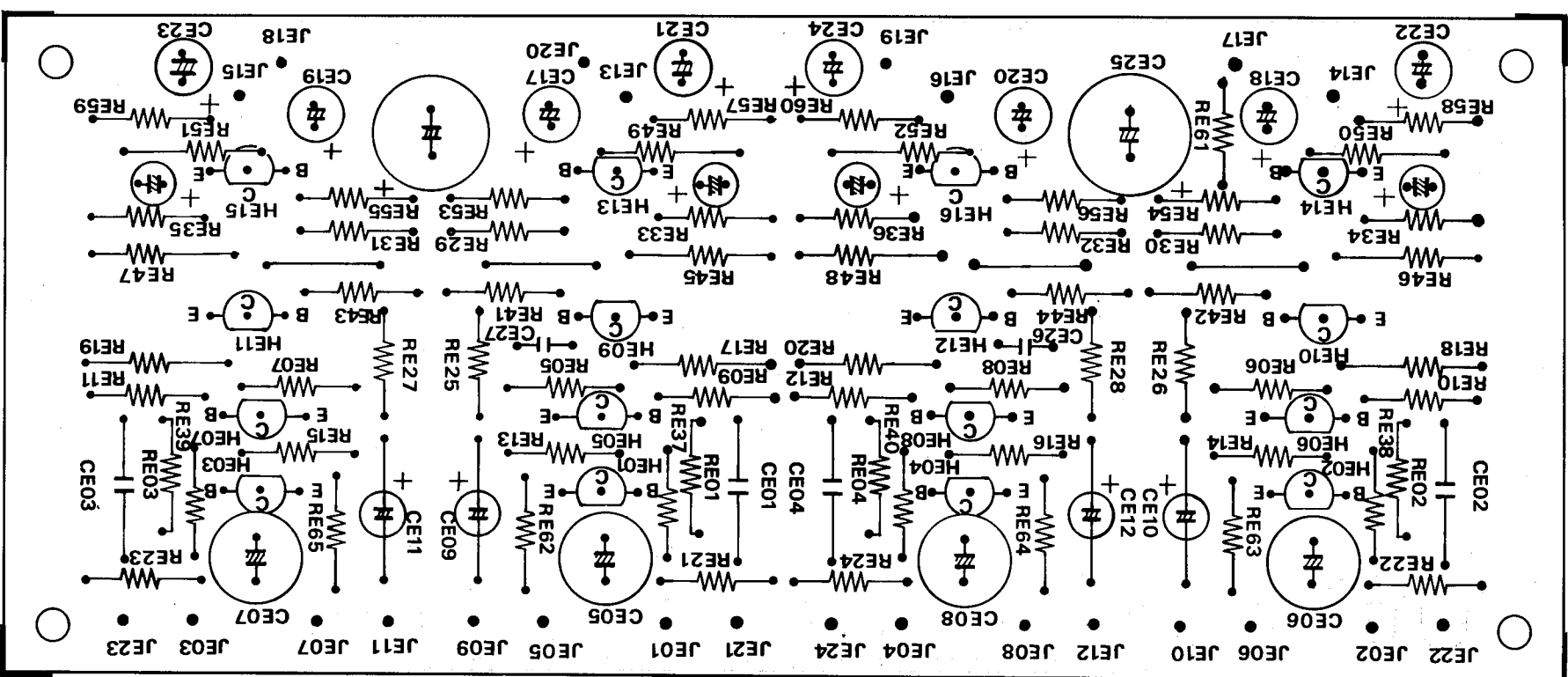


Figure 17. Buffer, Pre-Amplifier Assembly PE01 Component Locations

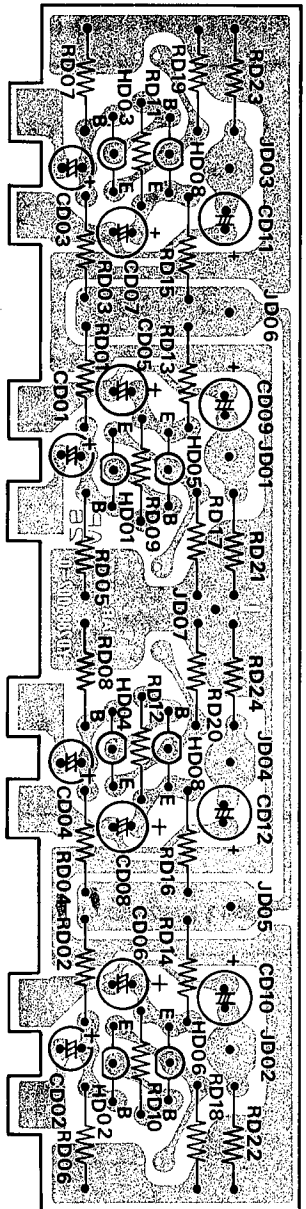


Figure 18. Tone Amplifier Assembly PD01 Component Locations

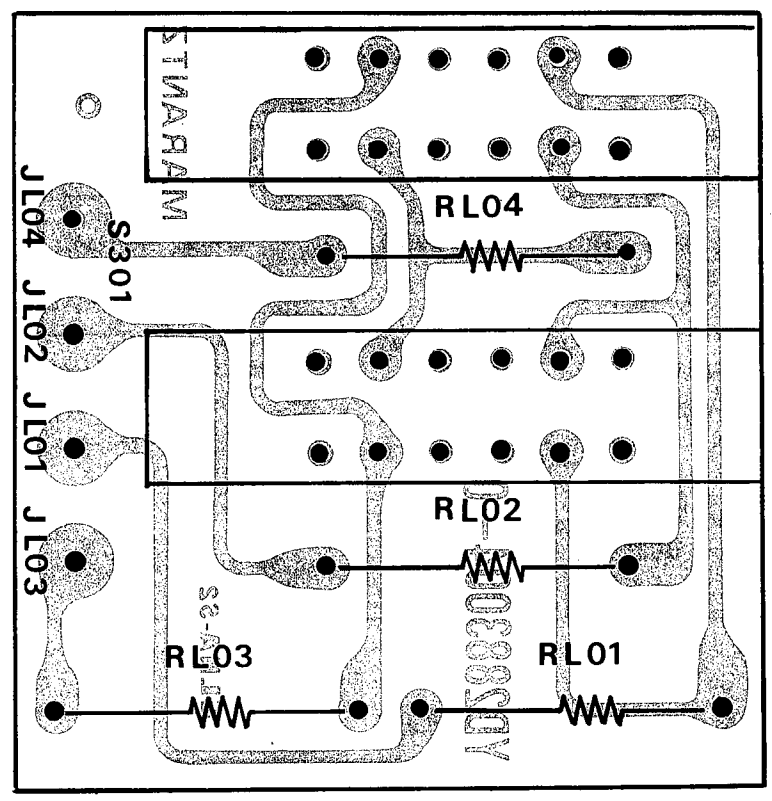


Figure 19. Main-Remote Speaker Switch Unit Assembly PL01 Component Locations

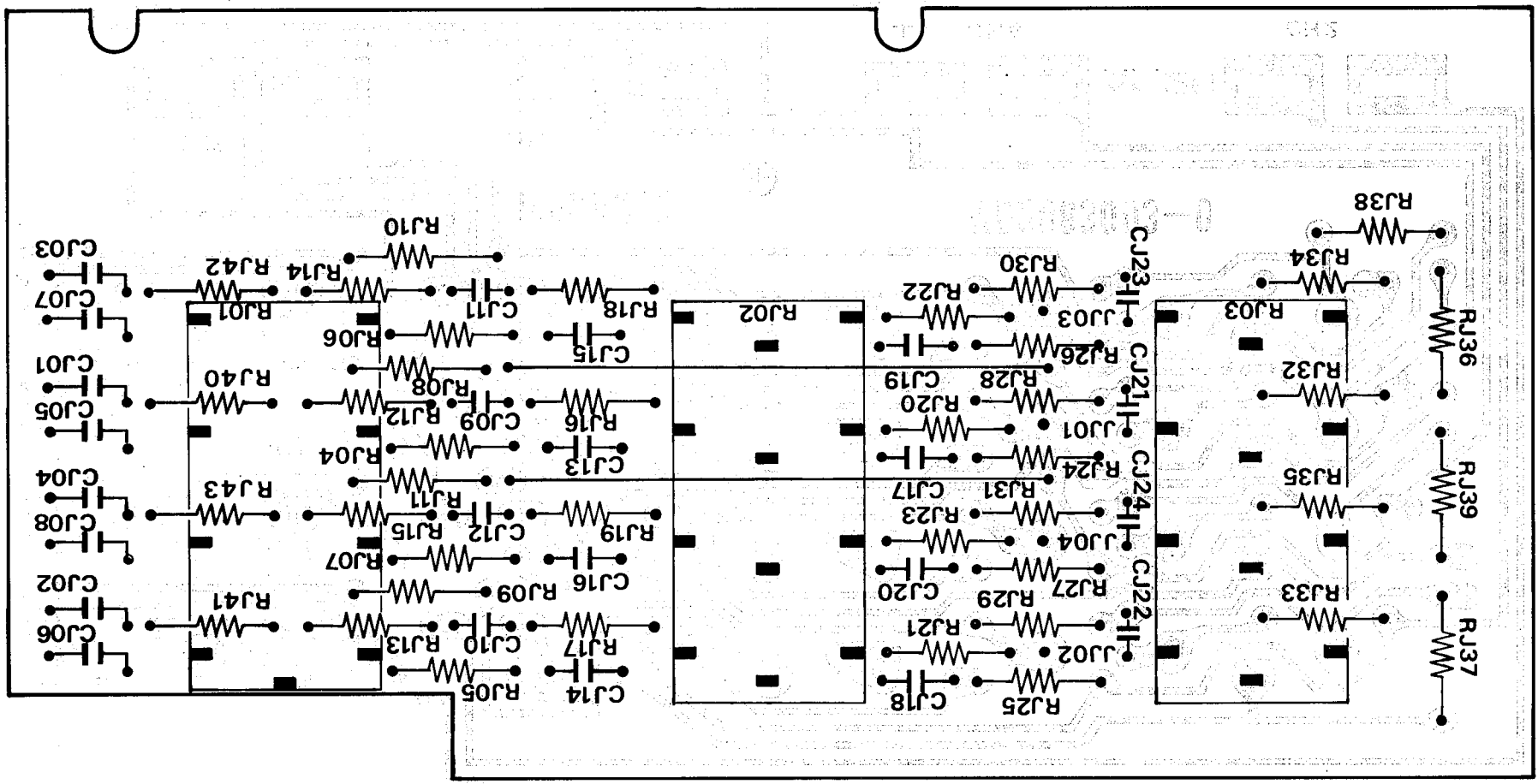


Figure 20. Tone Control Unit Assembly PJ01 Component Locations

INTEGRALIZ



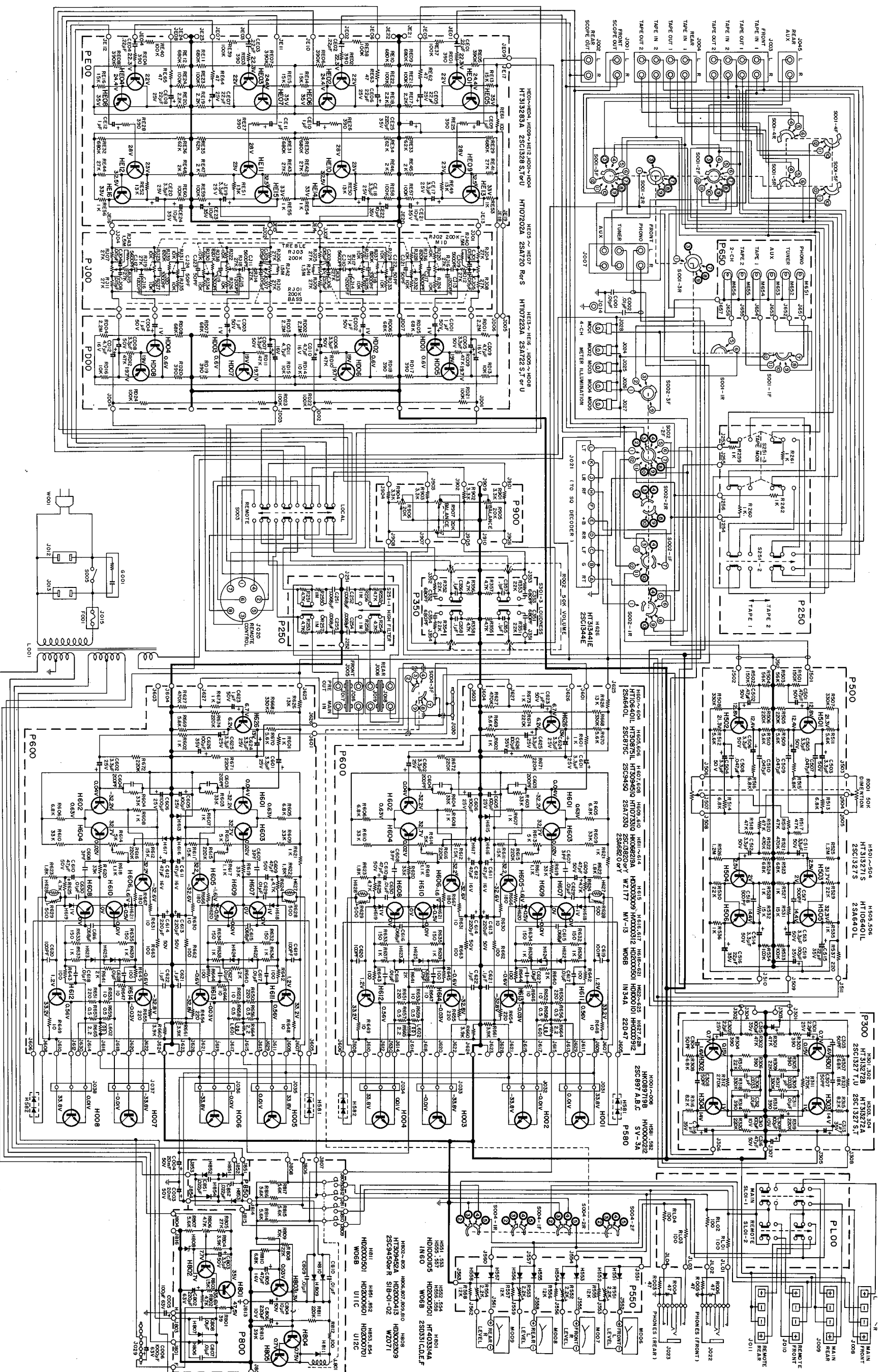


Figure 21. Schematic Diagram







REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
H802	HT309452A	Transistor, 2SC945 Q or R
H803	HT309452A	Transistor, 2SC945 Q or R
H804	HT309452A	Transistor, 2SC945 Q or R
H805	HT309452A	Transistor, 2SC945 Q or R
H806	HD2000413	Diode, SIB-01-02
H807	HD2000413	Diode, SIB-01-02
H808	HD3002309	Diode, WZ-071
H809	HD2000413	Diode, SIB-01-02
H810	HD2000413	Diode, SIB-01-02
H811	HD2000501	Diode, W06B
<b>MISCELLANEOUS</b>		
L801	LY4024003	Relay
J801 J816	YP1000099	Plug
0925	273026702	Heat-Sink
1111	51060308E	P.H.M. Screw x 2
1112	53110303E	Hexagon Nut
1113	54040302N	Spring Washer
2636	62031650W	Lug
C005	EA1070631	Electroly Cap., 100 $\mu$ F, +50%, -10%, 63V
P850	YD2855012 ZZ2855012	P.W. Board, Rectifier P.W. Board Ass'y
<b>CAPACITORS AND DIODE</b>		
C851	DF2722350	Film Cap., 0.022 $\mu$ F $\pm$ 20%, 400V
C852	DF2722350	Film Cap., 0.022 $\mu$ F $\pm$ 20%, 400V
H851	HD2000601	Diode, U11C
H852	HD2000601	Diode, U11C
H853	HD2000701	Diode, U12C
H854	HD2000701	Diode, U12C
<b>MISCELLANEOUS</b>		
J851 J856	YP1000099	Plug
0403	285516050	Bracket K
0408	281816003	Bracket
0409	281816004	Bracket
0419	285527401	Reflector
0420	285510102	Support x 2
0426	287105302	Cover x 4
0432	288310701	Sheet x 2
0503	51100306A	B.H.M. Screw x 6
0505	51102605A	B.H.M. Screw x 6
0507	51570306B	P.H. Tapt Screw x 8
0508	54050300R	T.L. Washer OR x 8
0515	51570306B	P.H. Tapt Screw x 2
0521	51042605A	F.H.M. Screw x 2
0522	51102605A	B.H.M. Screw x 2
0523	54042602N	Spring Washer x 2

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0525	51100406A	B.H.M. Screw x 4
0528	51100306A	B.H.M. Screw x 2
P350	YD2855011 ZZ2883111	P.W. Board, Loudness P.W. Board Ass'y
<b>RESISTORS</b>		
R351	RT0522314	22K $\Omega$ $\pm$ 5%, $\frac{1}{4}$ W
R352	RT0522314	22K $\Omega$ $\pm$ 5%, $\frac{1}{4}$ W
R353	RT0522314	22K $\Omega$ $\pm$ 5%, $\frac{1}{4}$ W
R354	RT0522314	22K $\Omega$ $\pm$ 5%, $\frac{1}{4}$ W
R355	RT0547214	4.7K $\Omega$ $\pm$ 5%, $\frac{1}{4}$ W
R356	RT0547214	4.7K $\Omega$ $\pm$ 5%, $\frac{1}{4}$ W
R357	RT0547214	4.7K $\Omega$ $\pm$ 5%, $\frac{1}{4}$ W
R358	RT0547214	4.7K $\Omega$ $\pm$ 5%, $\frac{1}{4}$ W
<b>CAPACITORS</b>		
C351	DK1668101	Ceramic, 680PF $\pm$ 10%
C352	DK1668101	Ceramic, 680PF $\pm$ 10%
C353	DK1668101	Ceramic, 680PF $\pm$ 10%
C354	DK1668101	Ceramic, 680PF $\pm$ 10%
C355	EM1040251	Electroly, 0.1 $\mu$ F $\pm$ 20%
C356	EM1040251	Electroly, 0.1 $\mu$ F $\pm$ 20%
C357	EM1040251	Electroly, 0.1 $\mu$ F $\pm$ 20%
C358	EM1040251	Electroly, 0.1 $\mu$ F $\pm$ 20%
<b>MISCELLANEOUS</b>		
J351 J355	YP1000099	Plug
PL01	YD2883004 ZZ2883004	P.W. Board, SP. Mode P.W. Board Ass'y
<b>RESISTORS</b>		
RL01	RJ1010102	100 $\Omega$ $\pm$ 10%, 2W
RL02	RJ1010102	100 $\Omega$ $\pm$ 10%, 2W
RL03	RJ1010102	100 $\Omega$ $\pm$ 10%, 2W
RL04	RJ1010102	100 $\Omega$ $\pm$ 10%, 2W
JL01	YP1000099	Plug
JL02	YP1000099	Plug
JL03	YP1000099	Plug
JL04	YP1000099	Plug
SL01	SP0403006	Push Switch
P250	YD2855002 ZZ2855002	P.W. Board, Hi Filter, Tape Monitor P.W. Board Ass'y
<b>RESISTORS</b>		
All resistors are $\pm$ 5% and $\frac{1}{4}$ W.		
R251	RT0547214	Resistor, 4.7K $\Omega$
R252	RT0547214	Resistor, 4.7K $\Omega$
R253	RT0547214	Resistor, 4.7K $\Omega$
R254	RT0547214	Resistor, 4.7K $\Omega$
R255	RT0510514	Resistor, 1M $\Omega$
R256	RT0510514	Resistor, 1M $\Omega$
R257	RT0510514	Resistor, 1M $\Omega$
R258	RT0510514	Resistor, 1M $\Omega$
R259	RT0510214	Resistor, 1K $\Omega$
R260	RT0510214	Resistor, 1K $\Omega$
R261	RT0510214	Resistor, 1K $\Omega$
R262	RT0510214	Resistor, 1K $\Omega$

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
<b>CAPACITORS</b>		
C251	DF1682201	Film, 0.0082 $\mu$ F $\pm$ 10%
C252	DF1682201	Film, 0.0082 $\mu$ F $\pm$ 10%
C253	DF1682201	Film, 0.0082 $\mu$ F $\pm$ 10%
C254	DF1682201	Film, 0.0082 $\mu$ F $\pm$ 10%
<b>MISCELLANEOUS</b>		
J251 }	YP1000099	Plug
J256		
S251	SP0403006	Pushswitch
P650	YD2855008 ZZ2883108	P.W. Board, Function Indicator P.W. Board Ass'y
<b>MISCELLANEOUS</b>		
M651 }	IN1006301	Lamp, 6.3V, 40mA
M656		
J651 }	YP1000094	Plug
J657		
PJ01	YD2883003 ZZ2883003	P.W. Board, Tone Volume P.W. Board Ass'y
<b>RESISTORS</b>		
All resistors are $\pm$ 5% and $\frac{1}{4}$ W, unless otherwise indicated.		
RJ01	RU0204001	Variable, 200K $\Omega$ (B)
RJ02	RU0204001	Variable, 200K $\Omega$ (B)
RJ03	RU0204001	Variable, 200K $\Omega$ (B)
RJ04	RT0527314	27K $\Omega$
RJ05	RT0527314	27K $\Omega$
RJ06	RT0527314	27K $\Omega$
RJ07	RT0527314	27K $\Omega$
RJ08	RT0527314	27K $\Omega$
RJ09	RT0527314	27K $\Omega$
RJ10	RT0527314	27K $\Omega$
RJ11	RT0527314	27K $\Omega$
RJ12	RT0527314	27K $\Omega$
RJ13	RT0527314	27K $\Omega$
RJ14	RT0527314	27K $\Omega$
RJ15	RT0527314	27K $\Omega$
RJ16	RT0527314	27K $\Omega$
RJ17	RT0527314	27K $\Omega$
RJ18	RT0527314	27K $\Omega$
RJ19	RT0527314	27K $\Omega$
RJ20	RT0510314	10K $\Omega$
RJ21	RT0510314	10K $\Omega$
RJ22	RT0510314	10K $\Omega$
RJ23	RT0510314	10K $\Omega$
RJ24	RT0510314	10K $\Omega$
RJ25	RT0510314	10K $\Omega$
RJ26	RT0510314	10K $\Omega$
RJ27	RT0510314	10K $\Omega$
RJ28	RT0568214	6.8K $\Omega$
RJ29	RT0568214	6.8K $\Omega$
RJ30	RT0568214	6.8K $\Omega$
RJ31	RT0568214	6.8K $\Omega$
RJ32	RT0510314	10K $\Omega$
RJ33	RT0510314	10K $\Omega$

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
RJ34	RT0510314	10K $\Omega$
RJ35	RT0510314	10K $\Omega$
RJ36	RT0562414	620K $\Omega$
RJ37	RT0562414	620K $\Omega$
RJ38	RT0562414	620K $\Omega$
RJ39	RT0562414	620K $\Omega$
RJ40	RT0510514	1M $\Omega$
RJ41	RT0510514	1M $\Omega$
RJ42	RT0510514	1M $\Omega$
RJ43	RT0510514	1M $\Omega$
<b>CAPACITORS</b>		
CJ01	DF1615305	Film, 0.015 $\mu$ F $\pm$ 10%, 50V
CJ02	DF1615305	Film, 0.015 $\mu$ F $\pm$ 10%, 50V
CJ03	DF1615305	Film, 0.015 $\mu$ F $\pm$ 10%, 50V
CJ04	DF1615305	Film, 0.015 $\mu$ F $\pm$ 10%, 50V
CJ05	DF1615305	Film, 0.015 $\mu$ F $\pm$ 10%, 50V
CJ06	DF1615305	Film, 0.015 $\mu$ F $\pm$ 10%, 50V
CJ07	DF1615305	Film, 0.015 $\mu$ F $\pm$ 10%, 50V
CJ08	DF1615305	Film, 0.015 $\mu$ F $\pm$ 10%, 50V
CJ09	DF1656205	Film, 5600PF $\pm$ 10%, 50V
CJ10	DF1656205	Film, 5600PF $\pm$ 10%, 50V
CJ11	DF1656205	Film, 5600PF $\pm$ 10%, 50V
CJ12	DF1656205	Film, 5600PF $\pm$ 10%, 50V
CJ13	DF1612205	Film, 1200PF $\pm$ 10%, 50V
CJ14	DF1612205	Film, 1200PF $\pm$ 10%, 50V
CJ15	DF1612205	Film, 1200PF $\pm$ 10%, 50V
CJ16	DF1612205	Film, 1200PF $\pm$ 10%, 50V
CJ17	DF1633205	Film, 3300PF $\pm$ 10%, 50V
CJ18	DF1633205	Film, 3300PF $\pm$ 10%, 50V
CJ19	DF1633205	Film, 3300PF $\pm$ 10%, 50V
CJ20	DF1633205	Film, 3300PF $\pm$ 10%, 50V
CJ21	DD1650001	Film, 50PF $\pm$ 10%, 50V
CJ22	DD1650001	Film, 50PF $\pm$ 10%, 50V
CJ23	DD1650001	Film, 50PF $\pm$ 10%, 50V
CJ24	DD1650001	Film, 50PF $\pm$ 10%, 50V
PD01	YD2883002 ZZ2883002	P.W. Board, Tone Amp. P.W. Board Ass'y
<b>RESISTORS</b>		
All resistors are $\pm$ 5% and $\frac{1}{4}$ W, unless otherwise indicated.		
RD01	RN1022514	2.2M $\Omega$ $\pm$ 10%, $\frac{1}{4}$ W
RD02	RN1022514	2.2M $\Omega$ $\pm$ 10%, $\frac{1}{4}$ W
RD03	RN1022514	2.2M $\Omega$ $\pm$ 10%, $\frac{1}{4}$ W
RD04	RN1022514	2.2M $\Omega$ $\pm$ 10%, $\frac{1}{4}$ W
RD05	RT0568314	68K $\Omega$
RD06	RT0568314	68K $\Omega$
RD07	RT0568314	68K $\Omega$
RD08	RT0568314	68K $\Omega$
RD09	RT0547314	47K $\Omega$
RD10	RT0547314	47K $\Omega$
RD11	RT0547314	47K $\Omega$
RD12	RT0547314	47K $\Omega$
RD13	RT0510314	10K $\Omega$
RD14	RT0510314	10K $\Omega$
RD15	RT0510314	10K $\Omega$
RD16	RT0510314	10K $\Omega$
RD17	RT0539114	390 $\Omega$
RD18	RT0539114	390 $\Omega$
RD19	RT0539114	390 $\Omega$
RD20	RT0539114	390 $\Omega$

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
RD21	RT0510414	100K $\Omega$
RD22	RT0510414	100K $\Omega$
RD23	RT0510414	100K $\Omega$
RD24	RT0510414	100K $\Omega$
<b>CAPACITORS</b>		
CD01	EV1050256	Electroly, 1 $\mu$ F +50%, -20%, 25V
CD02	EV1050256	Electroly, 1 $\mu$ F +50%, -20%, 25V
CD03	EV1050256	Electroly, 1 $\mu$ F +50%, -20%, 25V
CD04	EV1050256	Electroly, 1 $\mu$ F +50%, -20%, 25V
CD05	EV3350356	Electroly, 3.3 $\mu$ F +50%, -20%, 35V
CD06	EV3350356	Electroly, 3.3 $\mu$ F +50%, -20%, 35V
CD07	EV3350356	Electroly, 3.3 $\mu$ F +50%, -20%, 35V
CD08	EV3350356	Electroly, 3.3 $\mu$ F +50%, -20%, 35V
CD09	EQ4750161	Electroly, 4.7 $\mu$ F $\pm$ 30%, 16V
CD10	EQ4750161	Electroly, 4.7 $\mu$ F $\pm$ 30%, 16V
CD11	EQ4750161	Electroly, 4.7 $\mu$ F $\pm$ 30%, 16V
CD12	EQ4750161	Electroly, 4.7 $\mu$ F $\pm$ 30%, 16V
<b>SEMICONDUCTORS</b>		
HD01	HT313283A	Transistor, 2SC1328 S, T or U
HD02	HT313283A	Transistor, 2SC1328 S, T or U
HD03	HT313283A	Transistor, 2SC1328 S, T or U
HD04	HT313283A	Transistor, 2SC1328 S, T or U
HD05	HT107223A	Transistor, 2SA722 S, T or U
HD06	HT107223A	Transistor, 2SA722 S, T or U
HD07	HT107223A	Transistor, 2SA722 S, T or U
HD08	HT107223A	Transistor, 2SA722 S, T or U
<b>MISCELLANEOUS</b>		
0531	51102605A	B.H.M. Screw
0429	288310401	Retainer
P900	YD2855010 ZZ2855010	P.W. Board, Balance Control P.W. Board Ass'y
<b>RESISTORS</b>		
R901	RT0533214	3.3K $\Omega$ $\pm$ 5%, $\frac{1}{4}$ W
R902	RT0533214	3.3K $\Omega$ $\pm$ 5%, $\frac{1}{4}$ W
R903	RT0533214	3.3K $\Omega$ $\pm$ 5%, $\frac{1}{4}$ W
R904	RT0533214	3.3K $\Omega$ $\pm$ 5%, $\frac{1}{4}$ W
R905	RX0203012	Variable, 20K $\Omega$ (G)
R906	RX0203012	Variable, 20K $\Omega$ (G)
R907	RS0203004	Variable, 20K $\Omega$ (G)
<b>MISCELLANEOUS</b>		
J901 } J910	YP1000099	Plug
R002 R001	RG0503002 RM0503050	Variable, 50K $\Omega$ , Volume Variable, 50K $\Omega$ (B), Dimension
S002	SR0905004	Rotary Switch, Mode
J021 0911	YJ0700006 285110450	Jack, SQ Decoder Retainer K
1020 1021	51100312S 59030805P	B.H.M. Screw x 2 Washer x 2
S001	SR1205004	Rotary Switch, Selector
J022	YJ0100084	Jack, Headphone (Front)
R005 R006	RJ1047001 RJ1047001	Resistor, 47 $\Omega$ $\pm$ 10%, 1W Resistor, 47 $\Omega$ $\pm$ 10%, 1W

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
J023	YJ0100084	Jack, Headphone (Rear)
R003 R004	RJ1047001 RJ1047001	Resistor, 47 $\Omega$ $\pm$ 10%, 1W Resistor, 47 $\Omega$ $\pm$ 10%, 1W
J024 } J027	YJ0800019	Jack, Lamp
0411 0412	285427401 285427101	Reflector x 4 Holder x 4
0510 0511 0512	51100306A 54050300R 51570306B	B.H.M. Screw x 4 T.L. Washer OR x 4 P.H. Tapt Screw x 4
M002 } M005	IN1008007	Lamp. Meter Illumi.
J028	YJ0800019	Jack, Quad Indicator
0414 0415	285327402 285327102	Reflector Holder
0517 0518 1126 M001	51100306A 51570306B 62031650W IN1008007	B.H.M. Screw P.H. Tapt Screw Lug, Earth Lamp, Quad Indicator
0422 0423 0425	285510901 285512002 280312001	Shield Insulator Insulator
M006 M007 M008 M009	IM1104205 IM1104206 IM1104205 IM1104206	DC Meter, FL DC Meter, FR DC Meter, RL DC Meter, RR
S005	SP0201010	Pushswitch, Power
G001	BF1040001	Printed Compo.
C007	DF1722380	Film Cap., 0.0022 $\mu$ F $\pm$ 20%, 450VAC
S003	SS0802007	Slide Switch
J044	YL0105003	Terminal, 5P
0616 J020 0723 0724	285116007 YJ1100012 51100306S 53110303E	Bracket Jack B.H.M. Screw x 2 Hexagon Nut x 2
D 0603 J001 J002 J003 J004 J005 J006 J007 J008	288316040 288316001 YT0202007 YT0202007 YT0208002 YT0208002 YT0204003 YT0204003 YT0206003 YT0304005	Bracket Ass'y Bracket Terminal, Scope (2P) Terminal, Scope (2P) Terminal, Tape (8P) Terminal, Tape (8P) Terminal, Pre Out, Main In Terminal, Pre Out, Main In Terminal, Phono, Tuner, Aux Terminal, Spk.
J009 J010 J011	YT0304005 YT0304005 YT0304005	Terminal, Spk. Terminal, Spk. Terminal, Spk.

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
J012	YJ0400018	Jack, AC Outlet
J013	YJ0400018	Jack, AC Outlet
J014	YT0101003	Terminal, Ground
J016	YP1000097	Plug, Pre Out, Main In
J017	YP1000097	Plug, Pre Out, Main In
J018	YP1000097	Plug, Pre Out, Main In
J019	YP1000097	Plug, Pre Out, Main In
0703	51100308S	B.H.M. Screw x 8
0704	53110303E	Hexagon Nut x 8
0707	51100308S	B.H.M. Screw x 16
0708	53110303E	Hexagon Nut x 16
0711	55060365S	T.R. Rivet x 4
0717	62041760W	Lug
0719	54050400R	T.L. Washer OR
0610	145525903	Bush
J015	YJ0800012	Socket, Fuse Holder
C001	DK1710301	Ceramic Cap., 0.001 $\mu$ F $\pm$ 20%, 50V
C002	DK1710301	Ceramic Cap., 0.001 $\mu$ F $\pm$ 20%, 50V
F001	FS1050004	Fuse, 5A
W001	YC0240010	AC Cord, For CANADA
A	288306340	Front Panel Ass'y
0103	288306301	Escutcheon
0104	285540101	Frame
0105	288315801	Window
0106	281825905	Bush x 7
0107	273125901	Bush x 2
0108	285025901	Bush x 3
0109	285505301	Cover
0431	288330201	Dial
J029	YL0107008	Terminal, 7P (SE-1)
C006	ED1080631	Electroly Cap., 1000 $\mu$ F +50%,-10%, 63V
B	281815440	Knob Ass'y
0118	281815404	Knob x 3
0119	71400149Q	Spring x 3
C	281815441	Knob Ass'y
0121	281815405	Knob x 3
0122	71400159Q	Spring x 3
0930	288316002	Bracket
0928	138200503	Clamper x 16
S004	SR0602010	Rotary Switch, Amp Mode
0231	951022101	Label, For CANADA
0232	288326508	Indicator, For CANADA
W002	YW2883001	Wire Material
W003	YX2883001	Wire Material
0134	275905701	Leg x 4

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0313	51490410S	B.H.M. Screw x 4
0617	281805501	Collar x 2
0725	51100312S	B.H.M. Screw x 2
0726	53110303E	Hexagon Nut x 2
0729	51100304S	B.H.M. Screw x 2
0903	288310550	Chassis K
0918	285110101	Support x 2
0920	288310901	Shield
0923	285510103	Support x 2
0927	282100501	Clamper
6436	138200503	Clamper
L001	TS6140305	Power Transf.
C003	EC2090501	Electroly Cap., 20mF, +50%,-10%, 50V
C004	EC2090501	Electroly Cap., 20mF, +50%,-10%, 50V
1003	51570306B	P.H. Tapt Screw x 10
1004	51100306S	B.H.M. Screw x 6
1007	51570306B	P.H. Tapt Screw x 8
1011	51100512A	B.H.M. Screw x 4
1012	53110501A	Hexagon Nut x 4
1013	54040502A	Spring Washer x 4
1014	54020501A	Flat Washer P x 4
1016	53110303E	Hexagon Nut x 2
1017	54040302N	Spring Washer x 2
1019	51100306S	B.H.M. Screw x 2
1022	54040402N	Spring Washer x 2
1026	51100306S	B.H.M. Screw x 4
1027	51100306S	B.H.M. Screw x 4
1028	51100306S	B.H.M. Screw x 4
1029	51100306S	B.H.M. Screw x 4
1030	51100306S	B.H.M. Screw x 4
1031	51100306S	B.H.M. Screw x 2
1103	51570408B	P.H. Tapt Screw x 4
1104	54020401E	Flat Washer P x 4
1106	51570408B	P.H. Tapt Screw x 2
1108	51570306B	P.H. Tapt Screw x 2
1109	51570306B	P.H. Tapt Screw
1123	51570306B	P.H. Tapt Screw x 7
1124	51570306B	P.H. Tapt Screw x 10
1125	54050300R	T.L. Washer OR x 10
6536	62031650W	Lug x 3
0112	281815401	Knob x 6
0113	281815402	Knob
0114	285015401	Knob x 3
0115	281815403	Knob x 4
0116	288615402	Knob
0124	285525701	Lid
0125	257711803	Spacer x 4
0127	285525750	Lid K
0131	285712001	Insulator
0132	285512001	Insulator x 2
0133	288312001	Insulator
0202	288326501	Indicator
0203	288326502	Indicator, For CANADA
0211	257886101	Label



REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0212	257886102	Label
0213	257886103	Label
0219	282186101	Label, LL24902, For CANADA
0220	282186102	Label, Fuse Caution
0224	951110101	Label, UL
0225	245786104	Label, CSA, For CANADA
0730	51100306S	B.H.M. Screw x 2
0417	285500701	Strip
0434	282711801	Spacer x 2
0303	52017039J	H. Head Bolt x 4
0305	51100406S	B.H.M. Screw x 9
0309	51480406S	B.H.M. Screw x 4
0320	288306450	Case K, For CANADA
0322	288600301	Punched Plate
0323	288205701	Leg x 4
0324	52010420A	H. Head Bolt x 4
0325	54080400R	T.L. Washer RR x 4
1202	288385101	Instructions
1209	288385601	Schematic Diagram
1210	288385602	Schematic Diagram, For CANADA
1217	281885104	Instructions
1218	281885108	Instructions
1220	288385107	Instructions
1223	257785450	Guarantee Card K
1302	288380101	Packing Case
1303	288380111	Packing Case
1305	288380102	Packing Case, For CANADA
1306	288380112	Packing Case, For CANADA
1308	285580301	Partitioner
1309	285580302	Partitioner
1310	285580303	Partitioner x 2, For CANADA
1312	901403540	Polyethylen Bag
1313	901433538	Polyethylen Bag, For CANADA
1314	901302501	Polyethylen Bag
1317	102980401	Sleeve
1319	273182101	Silicagel x 2
1322	952281501	Serial NO Card x 4
1323	952301512	Serial NO Card x 4 For CANADA
0130	285125703	Lid
0135	51216059E	Screw x 4
0221	285386101	Label
0131	285125703	Lid
0135	51216059E	Screw x 4
0221	285386101	Label

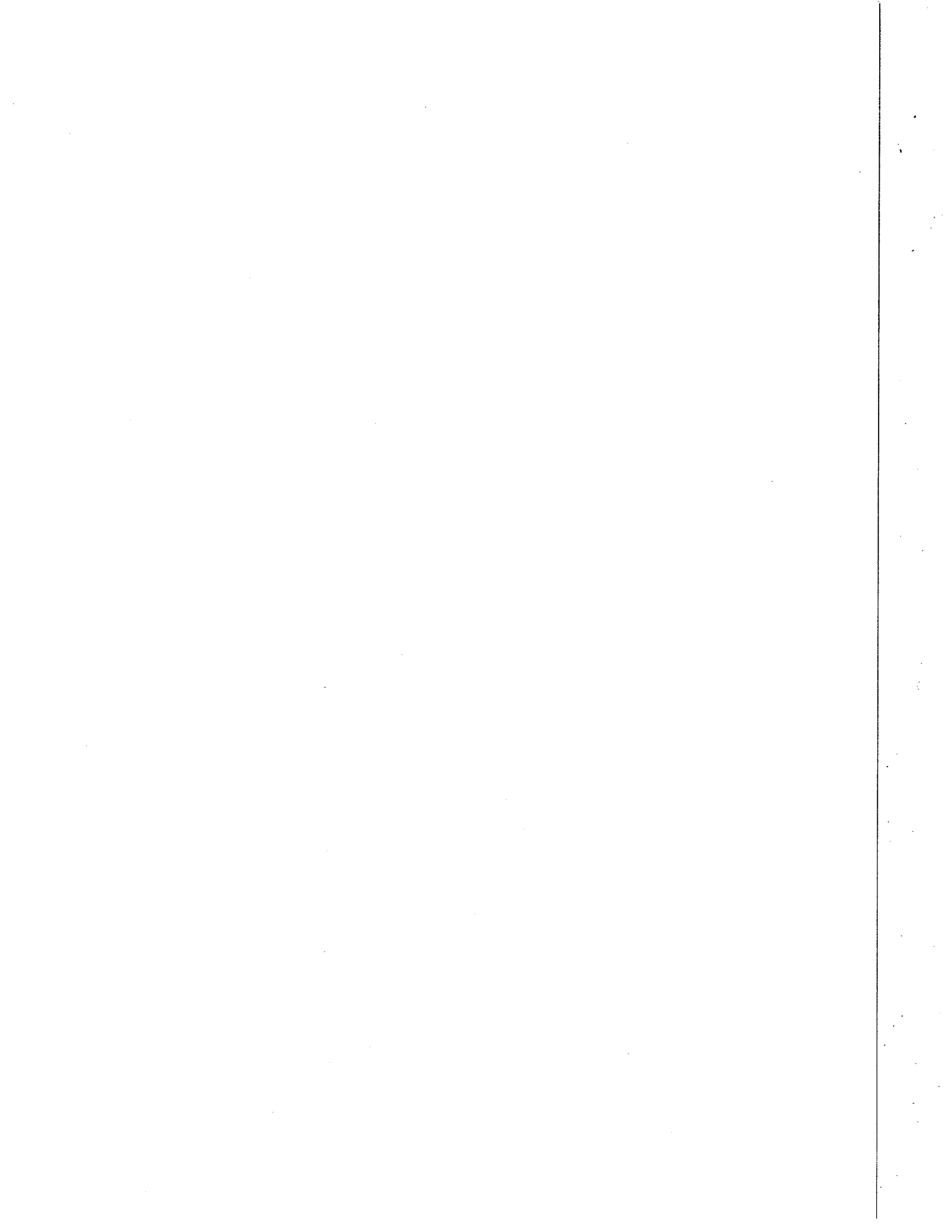
**TECHNICAL SPECIFICATIONS**

Input Impedance-Low level input .....	Phono 47 Kohm
-High level input .....	100 Kohm
Input Sensitivity-Phono .....	2.0mV for 25W output
-High level .....	150mV for 25W output
Frequency Response .....	1.0dB, 20Hz to 20KHz at 1W output
Intermodulation Distortion .....	Less than 0.3% at rated power output (S.M.P.T.E.)
Total Harmonic Distortion .....	Less than 0.3% at rated power output 20Hz to 20KHz with all channels driven
Damping Factor .....	Greater than 40 into 8 ohm load
Total Noise-From magnetic phono input to power amp output .....	Less than 2.8 $\mu$ V equivalent input at rated output into 8 ohm load
Volume Tracking .....	Within 3dB
Rated Continuous (RMS) Output per channel, all channels operating simultaneously .....	25Wx4 at 8 ohms 70Wx2 at 8 ohms
Comparable Total Music Power .....	150W at 8 ohms

**GENERAL**

Power Requirements .....	120V AC 50 to 60Hz
Power Consumption-at rated power output, all channels .....	400 watts
-idling (no signals) .....	25 watts
Dimensions-Panel Width .....	15-3/8 inches
-Panel Height .....	5-3/4 inches
-Depth .....	14-3/8 inches
Weight-Unit alone .....	33 lbs
-Packed for shipment .....	40.7 lbs

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





**marantz**

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