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SERVICE MANUAL

marantz

model 2215

Stereophonic Receiver

marantz

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LIST OF ILLUSTRATIONS

INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model 2215 Stereophonic Receiver.

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 receiver.

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 be usually be obtained through local suppliers.

1. Service Notes

As can be seen form the circuit diagram the chassis of Model 2215 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. FM Front End & AM Tuner . . . . . mounted on P.C. Board, P100
2. FM IF Amplifier and Detector Unit . . . . . mounted on P.C. Board, P200
3. Muting Control and Meter Amplifier Unit . . . . . mounted on P.C. Board, P300
4. MPX Stereo Decoding Amplifier . . . . . mounted on P.C. Board, P400
5. Phono Amplifier . . . . . mounted on P.C. Board, P900
6. Tone Amplifier . . . . . mounted on P.C. Board, P500
7. Tone Control Volume Unit . . . . . mounted on P.C. Board, P650
8. Power Amplifier . . . . . mounted on P.C. Board, P700
9. Power Supply . . . . . mounted on P.C. Board, P800
10. Loudness, Muting, High and low Filter Switch Unit . . . . . mounted on P.C. Board, P600

2. AM Tuner

All components except Tuning capacitor and ferrite bar antenna are mounted on a printed circuit board P100.

The AM signals induced in a ferrite bar antenna are applided to the base of Mixer transistor H102 through a capacitor of C109, while the local oscillator voltage is injected to the emitter of H102 through the capacitor C157. Both AM signals and oscillating voltage are mixed at the base-emitter junction and converted into 455 KHz intermediate frequency. The resulting IF signal is applied to the first IF transformer F101 consisting of one ceramic filter and two tuned circuits.

The output of F101 is led to the transistor H103 which in turn apply its output to the transistor of next stage H104. The fully amplified IF output is then applied to the diode H107 to detect audible signal through the detector transformer L102. The detected audio signal is filtered and amplified and the final audio output is obtained from the collector of H105 and applied: one to the tape out jacks through monitor switch on the front panel and the other to the function rotary switch.

The DC component of the detected IF signal is used as a AGC voltage to control emitter current of H103 and H102 through the resistor R112 and R106 respectively. A part of IF signal output is also applied to the diode H108 through a capacitor C123 and rectified to obtain DC current for energizing the AM signal strength meter M001.

3. FM Tuner

The FM Tuner section of Model 2215 is divided into three functional blocks: FM front end, IF amplifier & Detector, Muting control and MPX stereo decoding circuit.

FM signals induced on a FM antenna are led to FM antenna coil L103. These signals are then applied to the FET RF amplifier which in turn applies its output to the next Transistor Mixer H111 through a high-Q tuned circuit. The Mixer convert its input signal into 10.7MHz intermediate frequency and amplifies it. The H110 is a local oscillator and its output is injected into the base of Mixer transistor, the injection voltage is about 100 to 200mV. The 10.7MHz front end IF output is led to the next IF amplifier unit through a coaxial cable.

The IF amplifier unit consists of five stages of IF amplifiers. Two pieces of ceramic filters are used to obtain high selectivity a pair of symmetrical diode limiter is also employed for the best limitting characteristics, improved capture ratio and good AM suppression.

A part of IF amplifier H202 is rectified by the diodes H206 and H207 and its DC output is fed back to the gate of FET RF amplifier to decrease the gain of it with increased input signal strength.

3-1 Muting and Auto-Stereo Switching Circuits

The muting circuit consisting of all solid-state electrical switching has been incorporated in the Model 2215.

The DC voltage obtained by rectifing a part of IF output signal from the H204 is applied to the base of H304 and turns on it, if the IF output is greater than predetermined level (muting threshold level). When the H304 is turned on, the H305 is turned off, thus allowing the emitter-collector resistance of the H305 increasing and the collector voltage rises about 8V. The increased collector voltage increases the base bias voltage and makes the switching transistor H306 turn on, thus decreasing the collector-emitter resistance to near zero ohm and allowing the power supply path to the IC closed.

When the input signal is lower than the predetermined level, the DC output obtained is small and can not turn on the H304, thus the H304 keeps its turn-off state and this makes H305 turn on, decreasing the collector voltage and turning off H306. Thus no power is supplied to the IC H205 and signals below the threshold level are muted out. The muting threshold level can be varied by adjusting the trimming resistor R306.

The DC voltage developed at the collector of H305 is also used to make the Auto-Stereo switching transistor H403 turn on and off.

3-2 MPX Stereo Decoding Circuit

Non-equalized audio signals are applied to the first amplifier H401 which servs as a tuned amplifier for the pilot signal in the composite signals and as a buffer amplifier for the rest audio signals. The amplified 19KHz pilot signal is led to the second 19KHz amplifier H402 and further amplified if switching transistor H403 is turned on by the controlling DC signal as descibed above. The 19KHz pilot signal is rectified by the doubler circuit consisting of H412 and H413 to obtain synchronized 38KHz signal to drive the H404. The H404 is the 38KHz tuned amplifier and supplies its output to the switching matrix circuit consisting of four diodes. The composite signals are applied to the center tap of switching transformer L402-2 and decoded into left and right channel signals, then both channel signals are led to the crosstalk cancelling amplifier which utilizes complementary confuguration with NPN and PNP transistors through de-emphasiss net works. Transistors H313 and H314 are buffer amplifiers and their outputs are led to the function switch.

3.3 Suggestion for Trouble Shooting of FM Tuner

3.3.1 Symptom: No FM Reception

First turn ON the power switch and try to tune FM stations. Rotate the fly-wheel tuning knob slowly and observe the FM tuning meter. If the meter deflect at several frequencies received, the circuits preceding the IF amplifier H204 may have no failure. When no reading is obtained in the meter, check FM local oscillator circuit, using a RF VTVM. The normal local oscillator voltage is one or two volts (rms) at the tuning capacitor, depending on the tuning capacitor position. If the local oscillator voltage is normal, next check all voltage distributions in the FM circuits and compare them with those shown in the circuit diagram. When the tuning meter deflects but no sound is obtained, check audio circuits, using a high sensitive oscilloscope.

3.3.2 Symptom: No Stereo Separation

First check the "MONO" switch is in normal out position. Connect a FM RF signal generator output modulated by a stereo modulator to the rear FM antenna terminals, and check the stereo beacon is turned on or not. If not turned on, check for 19 KHz pilot signal and 38 KHz switching signal, using an oscilloscope.

4. Phono and Pre-amplifier

Signals from the tuner and AUX jacks are applied to the selector switch. Signals from the PHONO jacks are applied to the phono-amplifier consisting of transistor H901, H903 and H905. The gain of the amplifier is 40 dB. The amplified and equalized phono-signals are, then, fed to other section of the selector switch which, in turn, applies output signals from the tuner, phono-amplifier and AUX jacks to the TAPE MONITOR switch and TAPE OUT jacks. The TAPE MONITOR switch applies the signals to the balance and volume controls.

The controlled signals are fed to the pre-amplifier consisting of H501, H503 and H505. Frequency response of the amplifier can be varied by BASS and TREBLE controls. The controlled output are then led to the main amplifier through high and low pass filter push-switches.

5. Main Amplifier

Transistor H701 is a pre-driver coupled to the transistor H703 through capacitor C711. Transistor H703 drives the inverter transistors H709 and H710 which, in turn, drive the power stage consisting of H001 and H002. Transistors H705 and H709 are current limitters and operate as power protecting 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 H710. In this way the currents flowing in the power stage (H001 and H002) are restricted within a safe value.

6. Audio Trouble Analysis

1. Excessive line consumption	a. Check for shorted rectifiers H007, H804, H805.
	b. Check for shorted transistors H001, H002. Check L002 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, H804, H805 or open L002.
3. High hum and noise level.	a. Check filter capacitors C006, C703, & C704.
4. Parastic oscillation	a. Check for defective capacitors, C705, C706, C713, C714, C723 & C724.
5. Improper clipping	a. Check for proper adjustment of R729 & R730.

7. 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 the Model 2215 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. 1.

(3) Change the jumper wires as illustrated in Fig. 2 for the required AC voltage and replace the fuse as instructed.

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

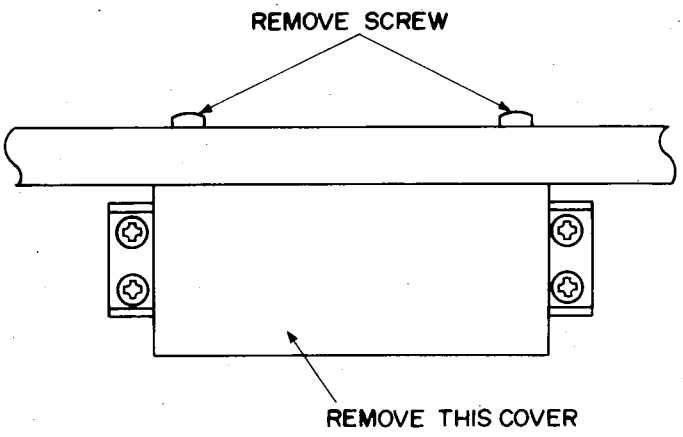
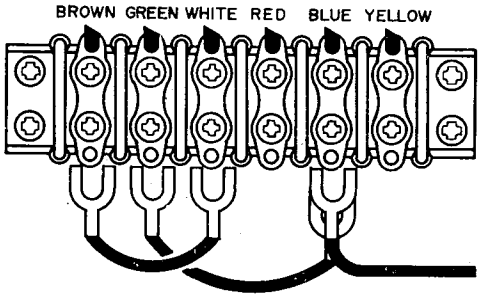
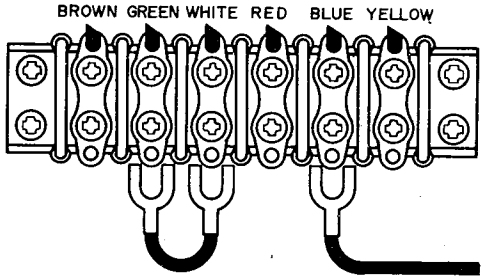


Figure 1. Remove the Terminal Cover

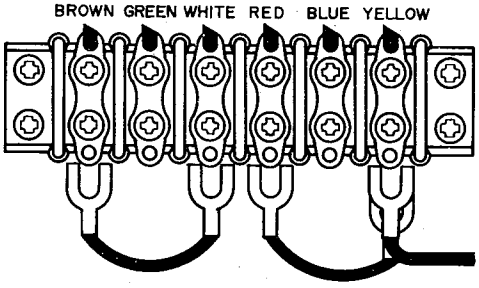
For 100 V Operation
(Use 2.5A Fuse)



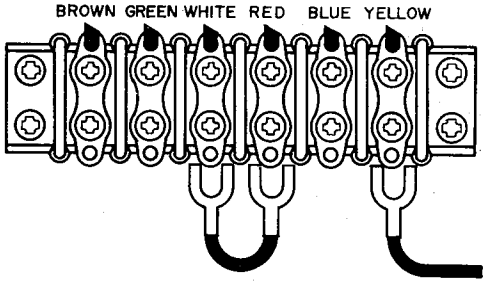
For 200V Operation
(Use 1.5A Fuse)



For 120 V Operation
(Use 2A Fuse)



For 220 V Operation
(Use 1A Fuse)



For 240V Operation
(Use 1A Fuse)

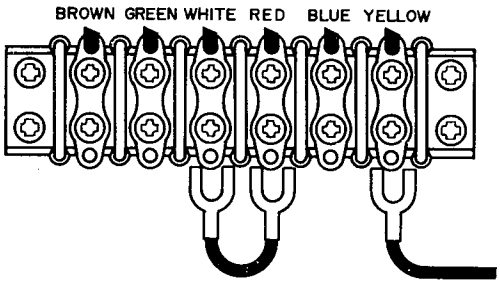


Figure 2. Voltage Conversion Chart

9. Test Equipment Required for Servicing

Table 1 lists the test equipment required for servicing the Model 2215 Receiver.

Item	Manufacturer and Model No.	Use
AM Signal Generator		Signal source for AM alignment
Test Loop		Used with AM Signal generator
FM Signal Generator	Less than 0.3% distortion	Signal source for FM alignment
Stereo Modulator	Less than 0.3% distortion	Stereo separation alignment and trouble shooting
Audio Oscillator	Weston Model CVO-100P, less than 0.02% residual distortion is required.	Sinewave and squarewave signal source.
Oscilloscope	High sensitivity with DC horizontal and vertical amplifiers.	Waveform analysis and Trouble Shooting, and ASO alignment.
VTVM	With AC, DC, RF range	Voltage measurements.
Circuit Tester		Trouble Shooting
AC Wattmeter	Simpson, Model 390	Monitors primary power to Amplifier.
AC Ammeter	Commercial Grade (1-10A)	Monitors amplifier output under short circuit condition.
Line Voltmeter	Commercial Grade (0-150VAC)	Monitors potential of primary power to amplifier
Variable Autotransformer (0-140VAC, 10 amps.)	Powerstat, Model 116B	Adjusts level of primary power to amplifier.
Shorting Plug	Use phono plug with 600 ohm across center pin and shell.	Shorts amplifier input to eliminate noise pickup.
Output Load (8 ohms, 0.5%, 100W)	Commercial Grade	Provides 8-ohm load for amplifier output termination.
Output Load (4 ohms, 0.5%, 100W)	Commercial Grade	Provides 4-ohm load for amplifier output termination.

9. AM Alignment Procedure

AM IF Alignment

1. Connect a sweep generator to the J102 and an alignment scope to the capacitor C125.
2. Rotate each core of IF transformer F101 and L102 for the maximum height and flat top symmetrical response.

AM Frequency Range and Tracking Alignment

1. Set AM signal generator to 525 KHz. Turn the tuning capacitor fully closed (place the tuning pointer at the low end.) and adjust the oscillator coil L101 for maximum audio output.
2. Set the signal generator to 1650 KHz. Place the tuning pointer in the high frequency end and adjust the trimming capacitor C155-2 for maximum audio output.
3. Repeat step 1 and 2 until no further adjustment is necessary.
4. Set the generator to 600 KHz and tune the receiver to the same frequency and adjust a slug core of AM ferrite rod antenna for maximum output.
5. Set the generator to 1400 KHz and tune the receiver to the same frequency and adjust the trimming capacitor C155-1 for maximum output.
6. Repeat the procedure 4 and 5 until no further adjustment is necessary.

Note: During tracking alignment reduce the signal generator output as necessary to avoid AGC action.

10. FM Alignment Procedure

1. Connect a FM signal generator to the FM antenna terminals and a oscilloscope and an audio distortion analyzer to the tape output jack on the rear panel.
2. Set the FM SG to 87.5 MHz and provide about 3 to 5μV. Place the tuning pointer at the low frequency end by rotating the tuning knob and adjust the core of oscillator coil L106 to obtain maximum audio output.
3. Set the FM SG to 108.5 MHz and provide about 3 to 5μV. Rotate the tuning knob and place the tuning pointer at the high frequency end and adjust the trimming capacitor C152 for maximum output.
4. Repeat the step 2 and 3 until no further adjustment is necessary.
5. Set the FM SG to 90 MHz and tune the receiver to the same frequency. Decrease signal generator output until the audio output level decreases with the decreasing generator output. Adjust the RF coil L104 and antenna coil L103 and IF transformer L105 for minimum audio distortion.
6. Set the FM SG to 106 MHz and tune the receiver to the same frequency. Decrease the signal generator output until the audio output level decreases with the decreasing generator output. Adjust the trimming capacitor C155-3 and C155-4 for minimum distortion.
7. Repeat the step 5 and 6 until no further adjustment is necessary.
8. Connect a DC VTVM with 1 V range selected across the capacitor C277 and adjust the secondary core (black) of discriminator transformer L201 so that no voltage reading is obtained on the VTVM at no signal. Next set the FM SG to 98 MHz and increase the output level 1 KμV, then tune the receiver to the same frequency so that no deflection is obtained on the VTVM. Adjust primary core (pink) of L201 for minimum distortion.

11. Stereo Separation Alignment

1. Set the FM SG to provide 1 KμV at 98 MHz. Tune the receiver to the same frequency so that the VTVM connected to the C227 will give no readings.
2. Modulate the FM SG with 67 KHz audio frequency. Connect a oscilloscope to the R413. Adjust the core of L403 for minimum height of the 67 KHz signal on the scope.
3. Modulate the FM SG output with stereo composite signal consisting of subchannel signal only (of course a pilot signal must be included.). Adjust the core of L410 for maximum audio output, then modulate the signal generator output with a stereo composite signal consisting of L channel signal only and again adjust the core of L401 for maximum audio output.
4. Adjust the trimming resistor R428 for maximum and same separation in both channels.

12. Muting Threshold Adjustment

1. Set the FM SG output to provide 12.5μV (IHF) at 98 MHz and tune receiver to the same frequency. Adjust the trimming resistor R306 for the threshold level of 12.5μV. (During this adjustment turn the MUTING push-switch "on".)

13. Audio 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 a 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 start clipping. Adjust the trimming resistor R723 for equal and symmetrical clipping. For the other channel adjust the R724.

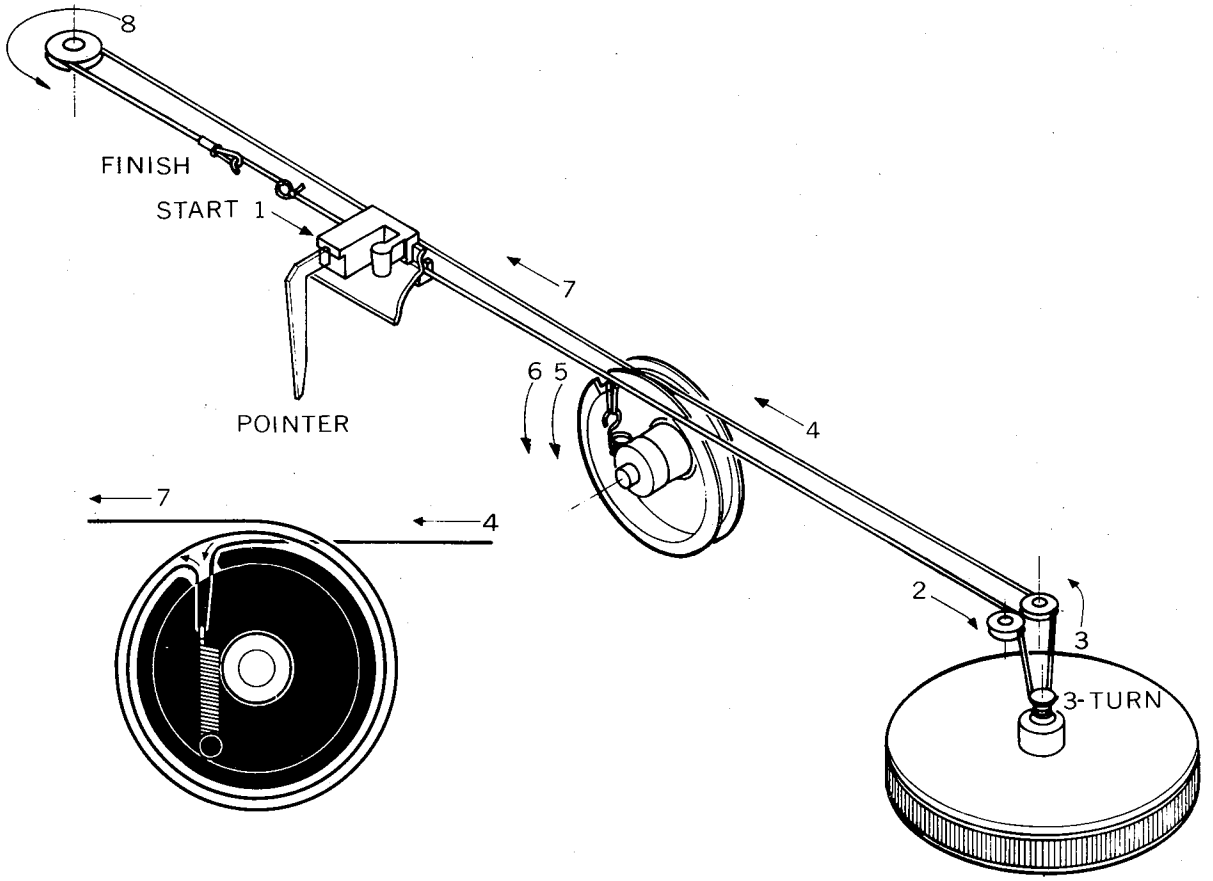


Figure 3. Dial Stringing

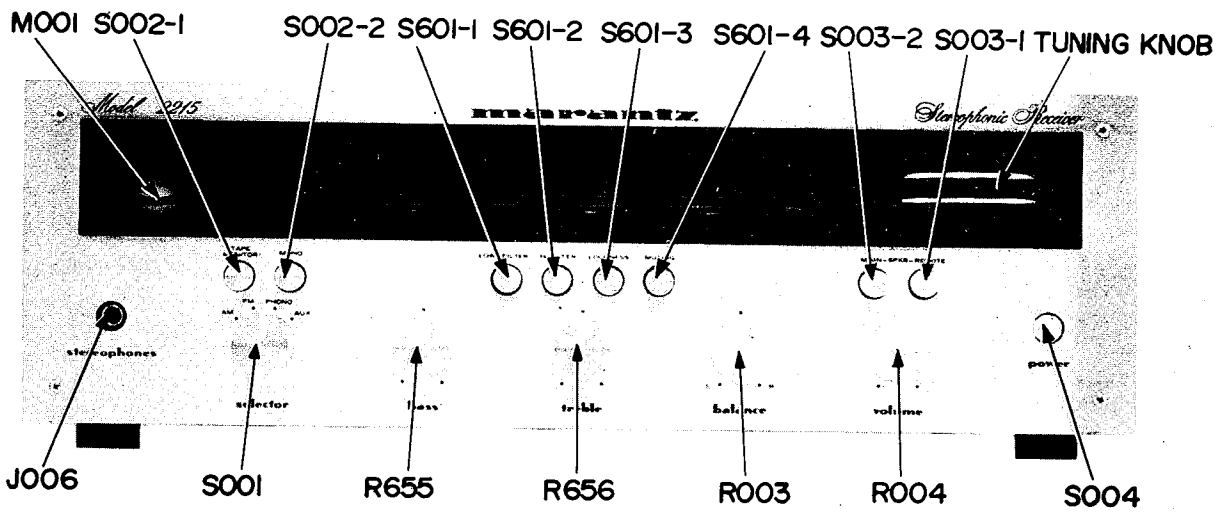


Figure 4. Front Panel Adjustment and Component Locations

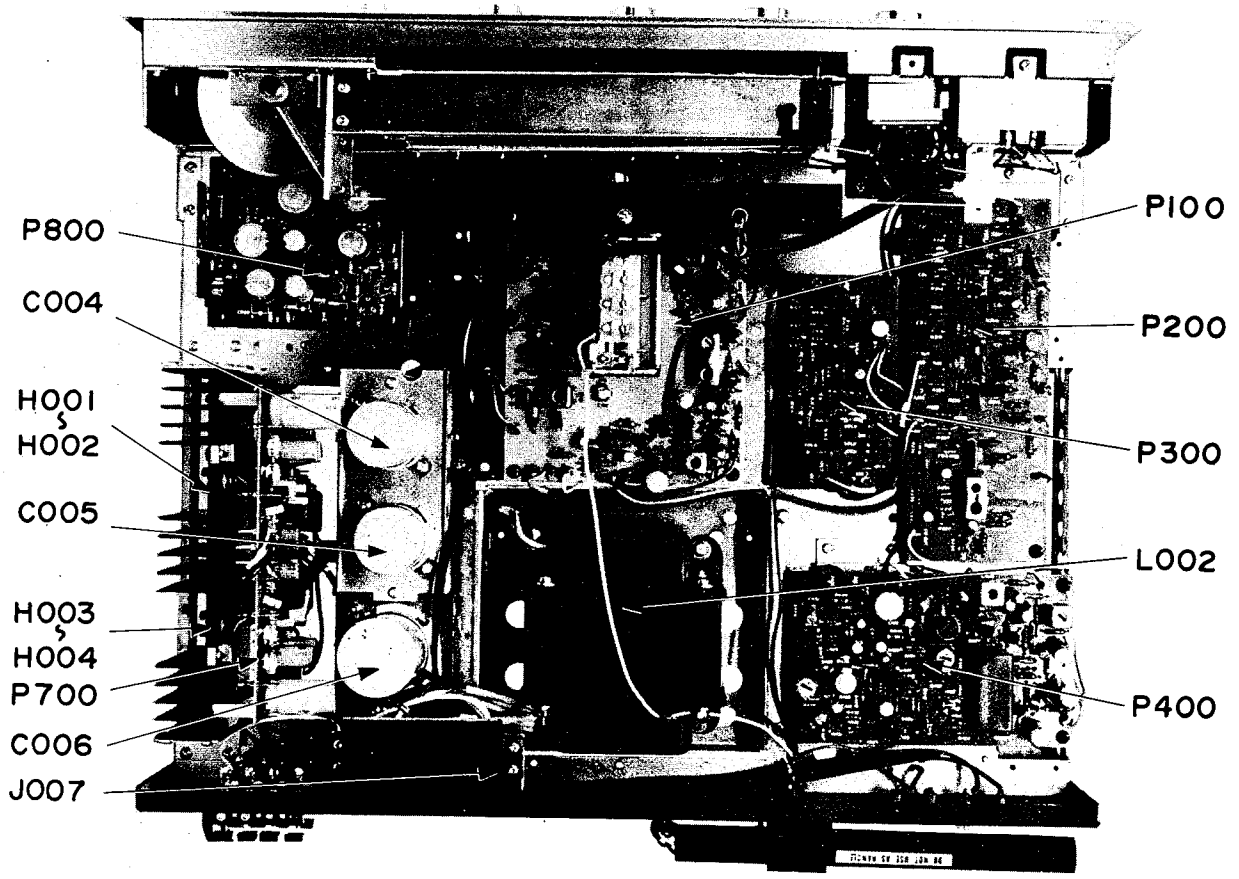


Figure 5. Main Chassis Component Locations (Top View)

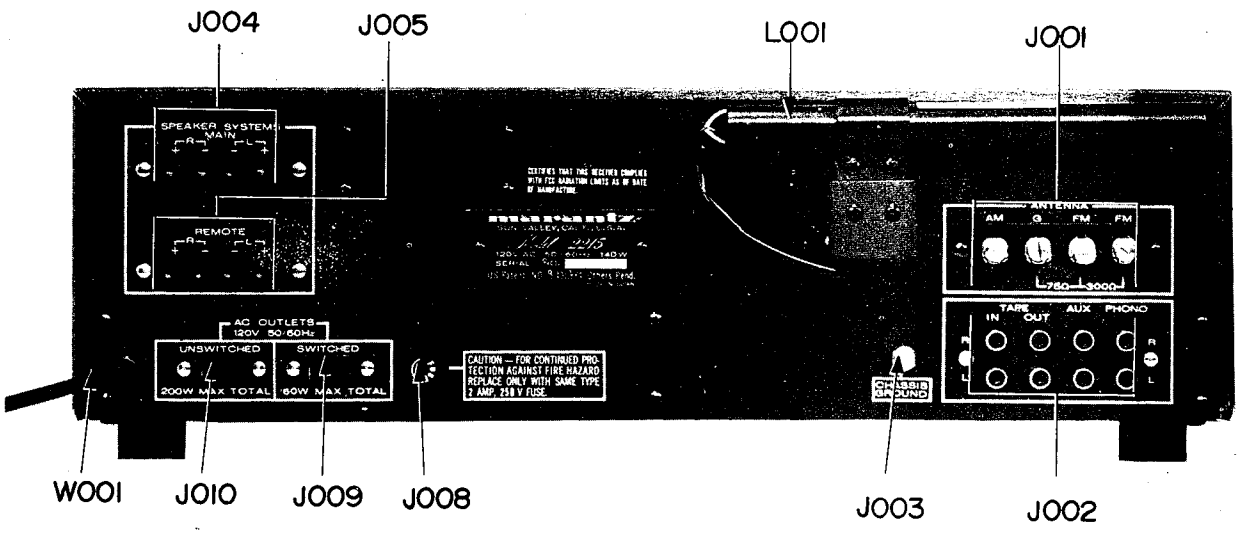


Figure 6. Rear Panel Adjustment and Component Locations

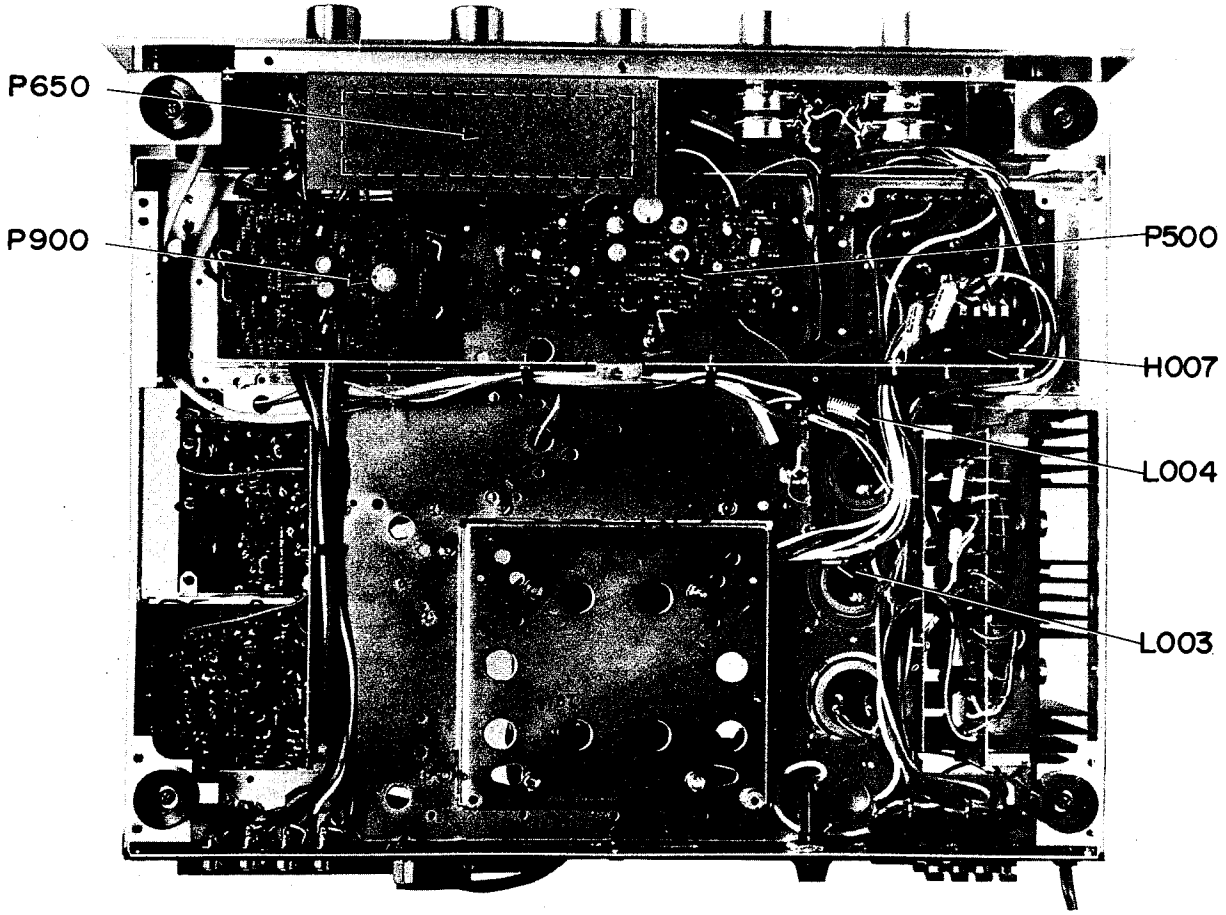


Figure 7. Main Chassis Component Locations (Bottom View)

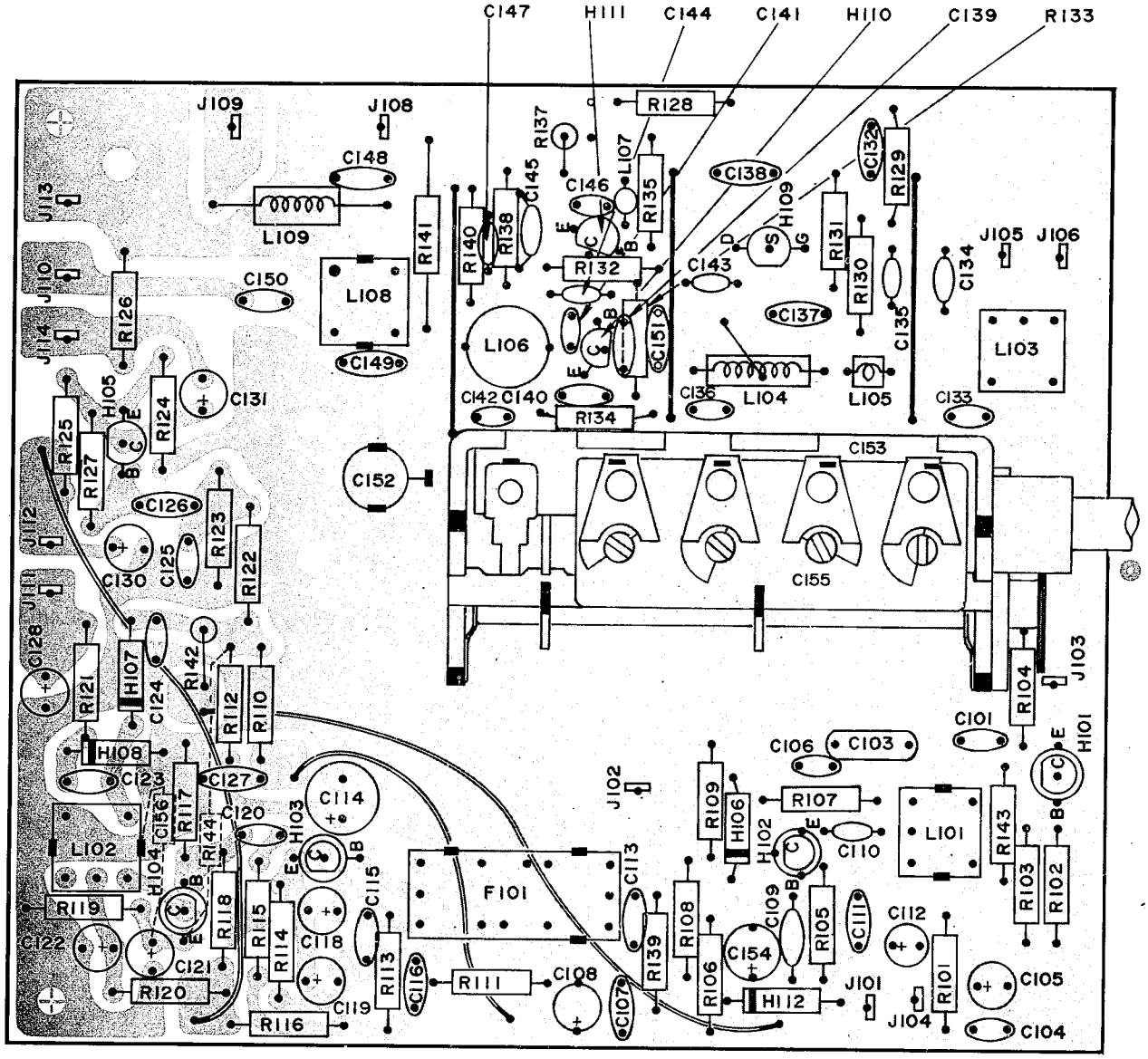


Figure 8. FM Front End and AM Tuner Assembly P100 Component Locations

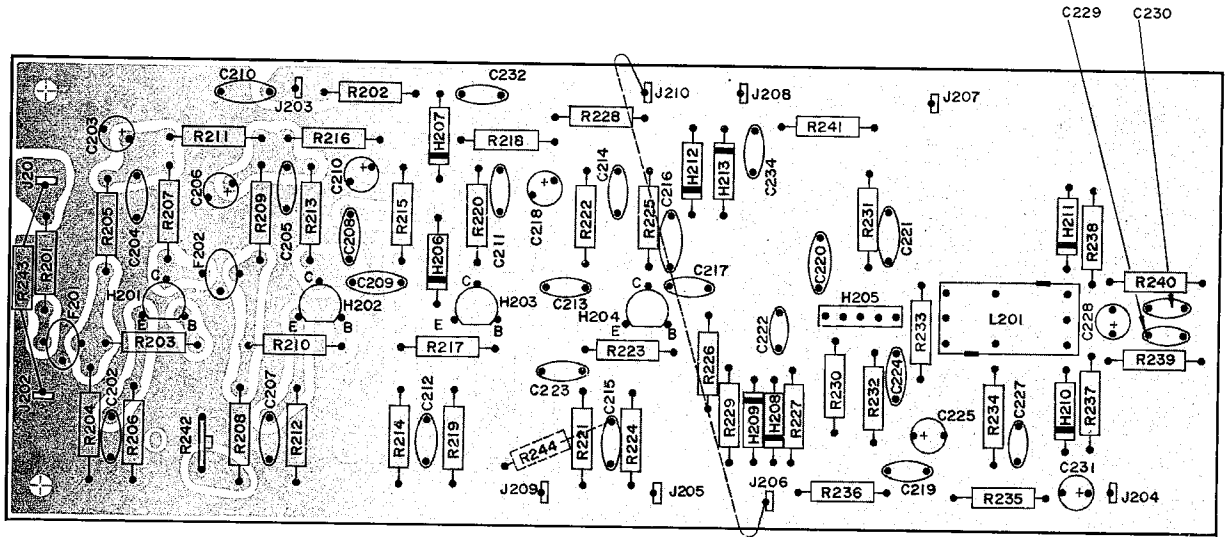


Figure 9. FM IF Amplifier and Detector Unit Assembly P200 Component Locations

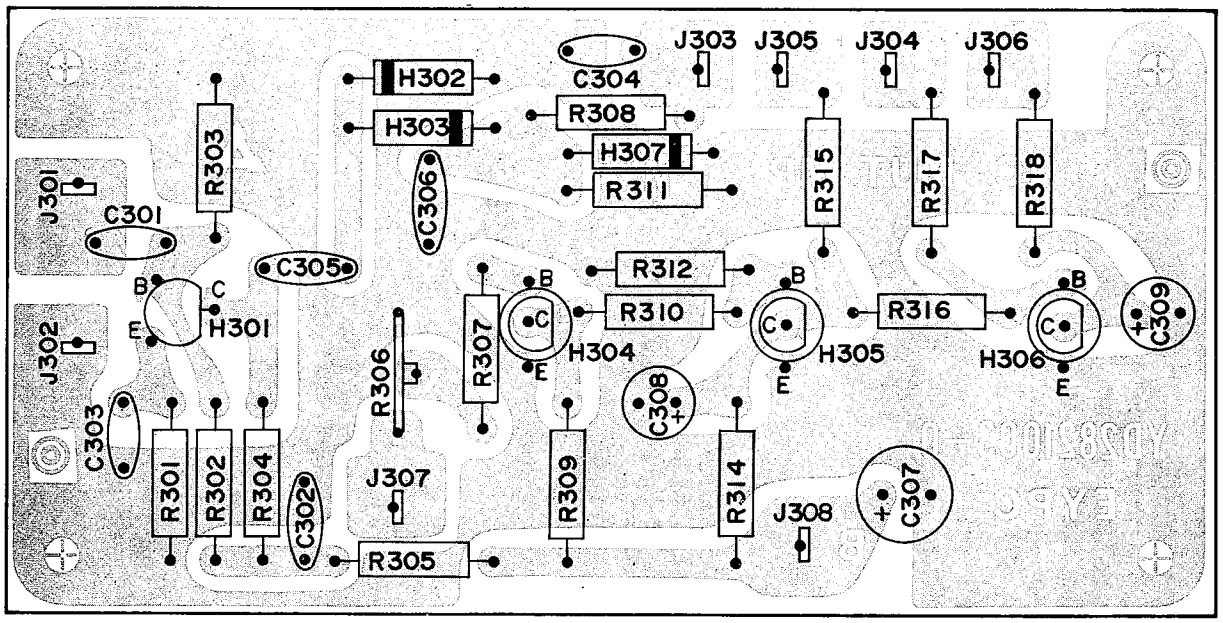


Figure 10. Muting Control and Meter Amplifier Unit Assembly P300 Component Locations

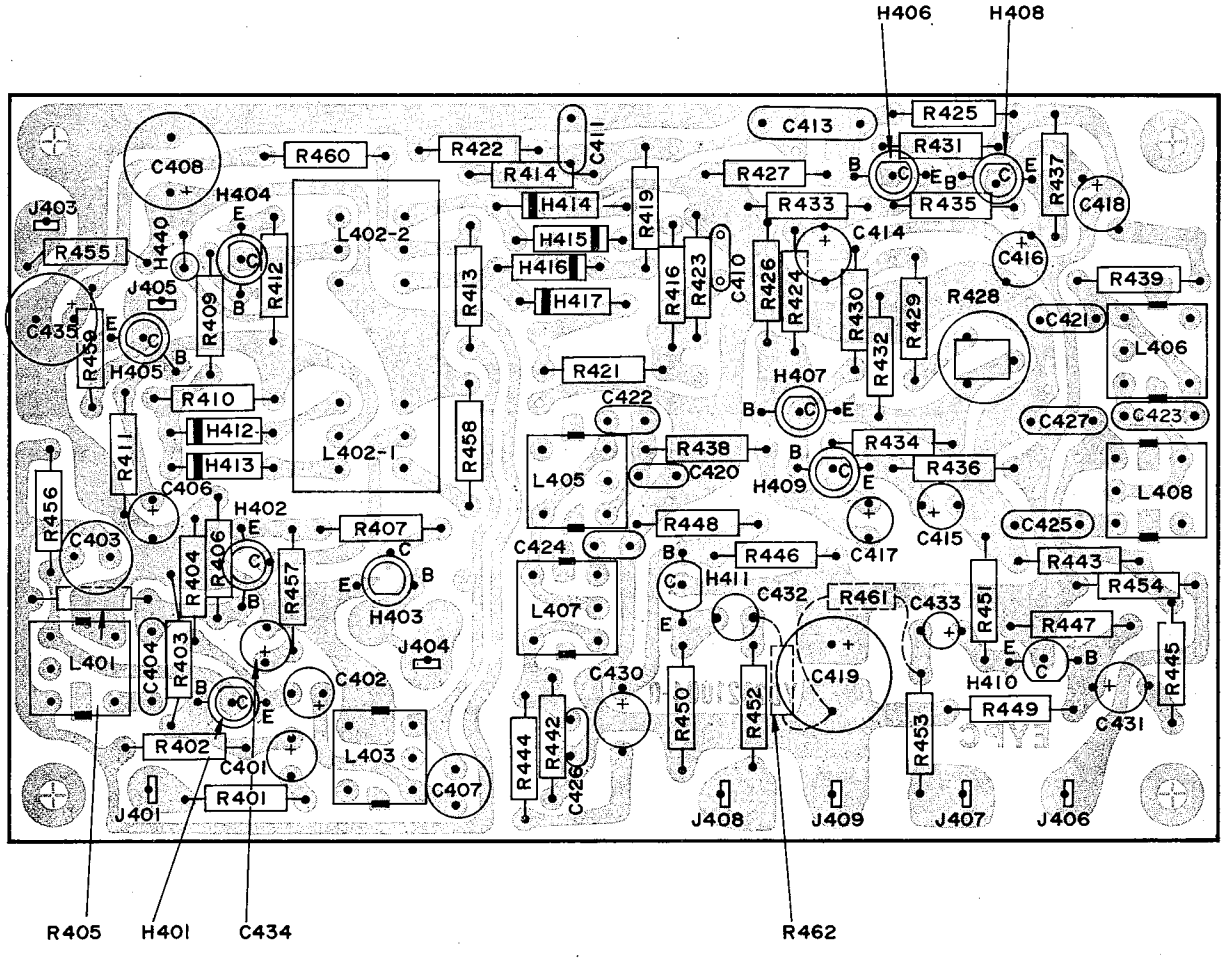


Figure 11. MPX Stereo Decoding Amplifier P400 Component Locations

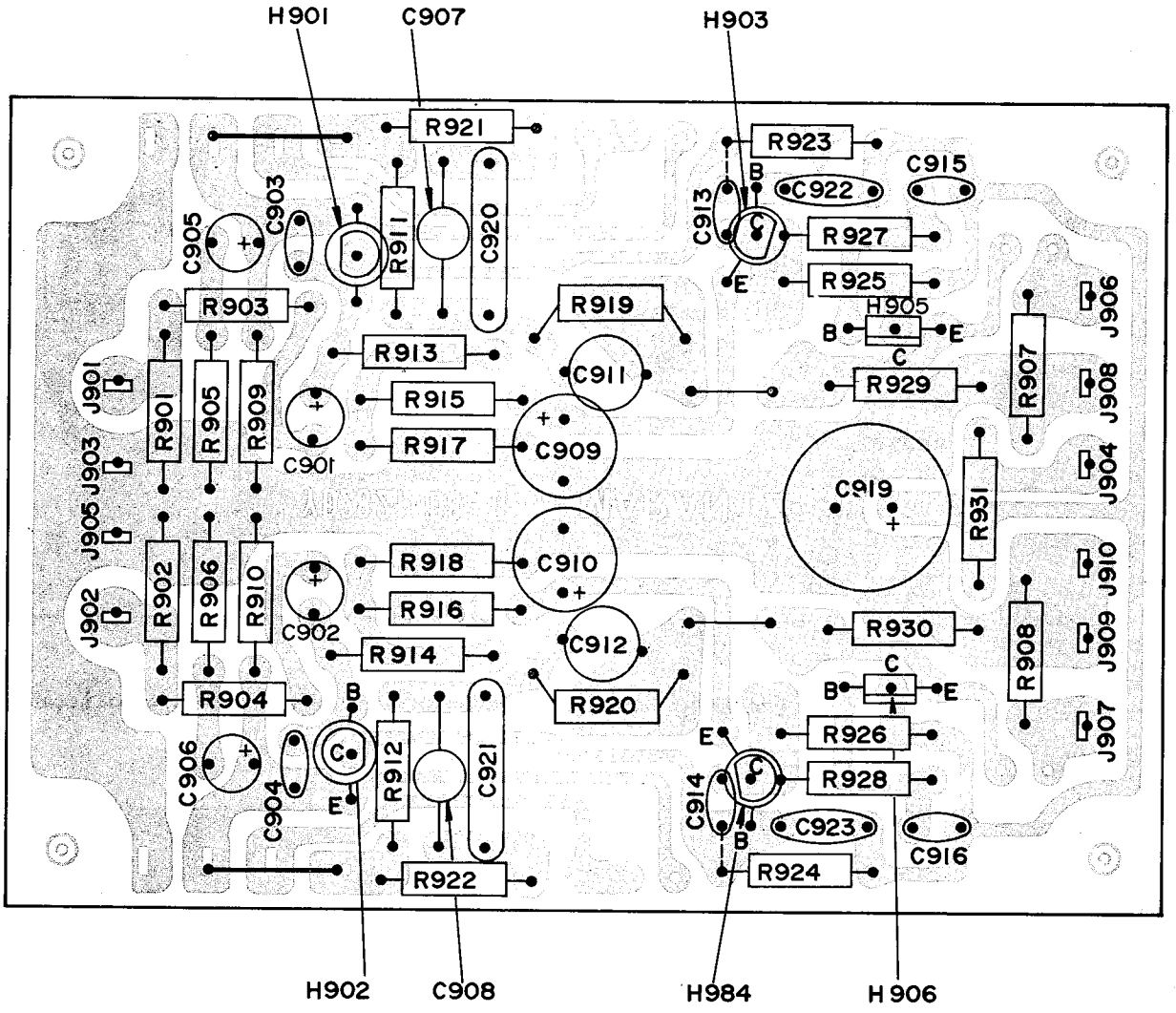


Figure 12. Phono Amplifier Assembly P900 Component Locations

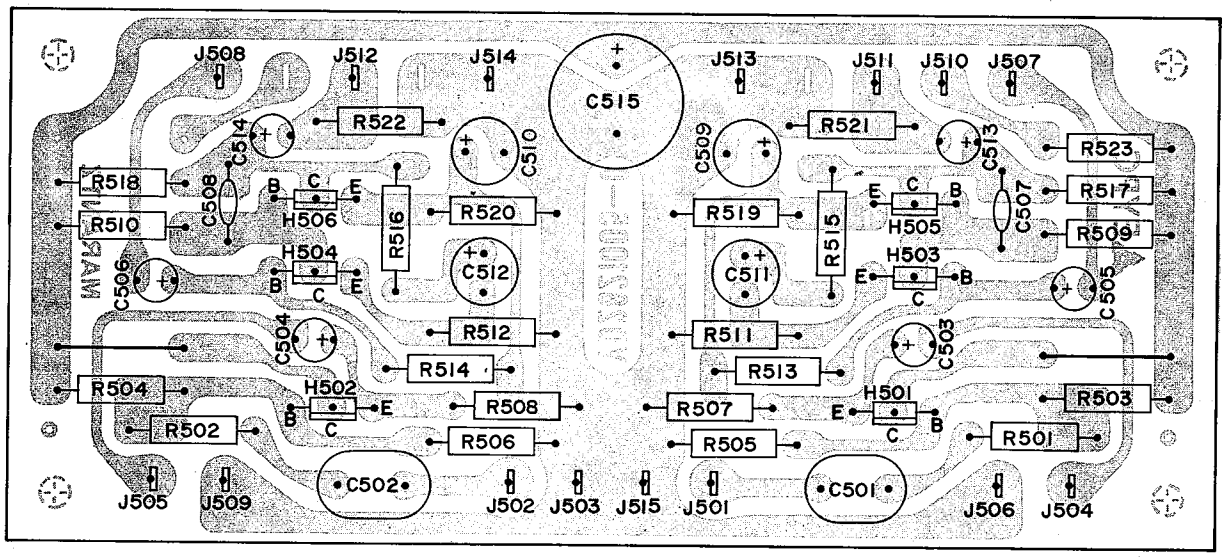


Figure 13. Tone Amplifier Assembly P500 Component Locations

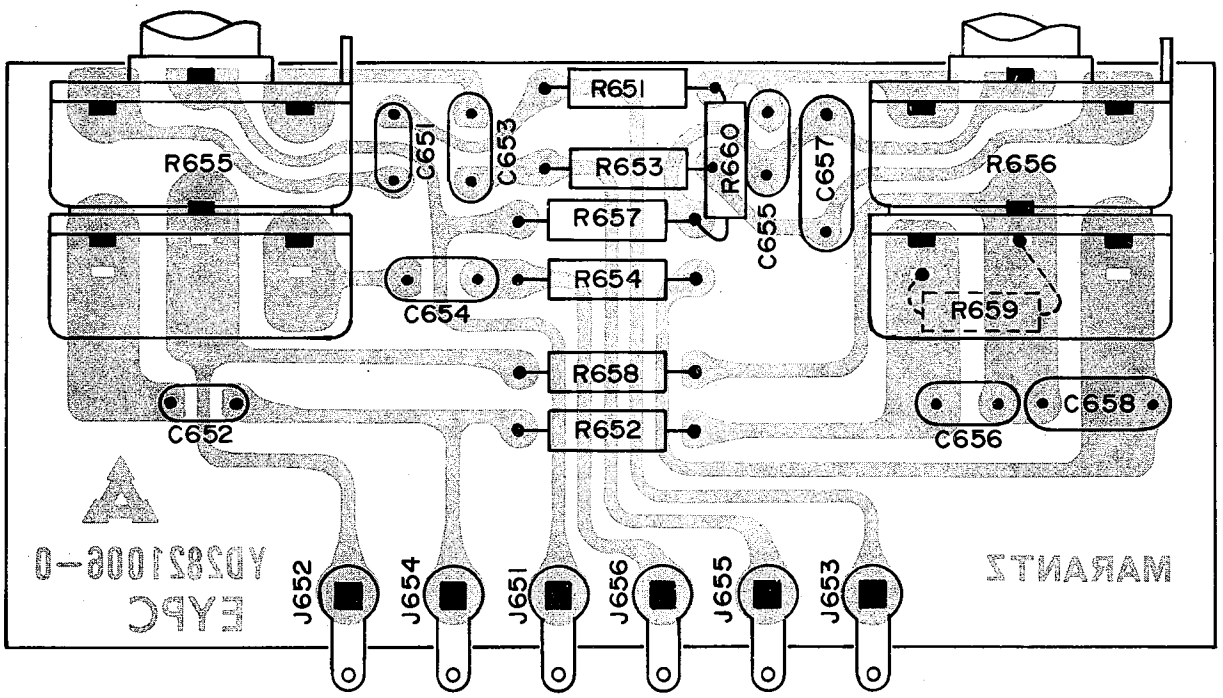


Figure 14. Tone Control Volume Unit Assembly P650 Component Locations

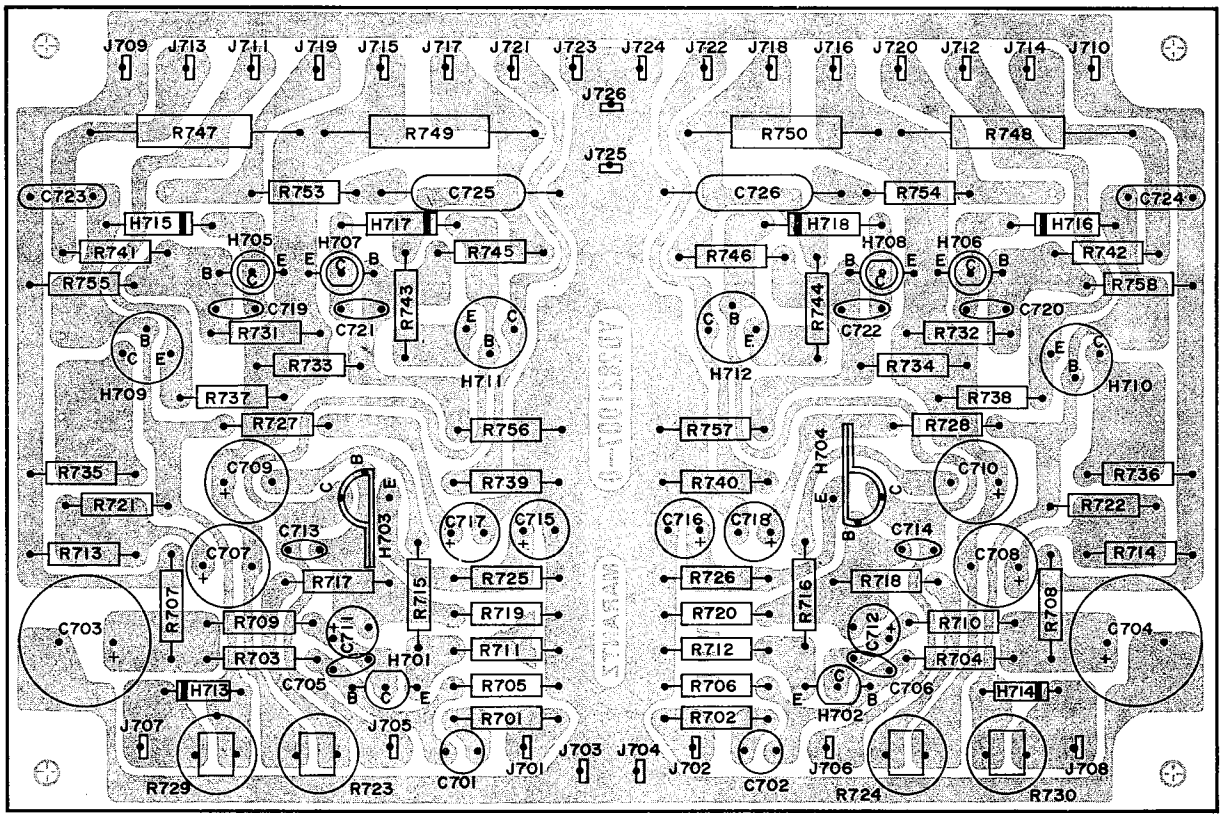


Figure 15. Power Amplifier Assembly P700 Component Locations

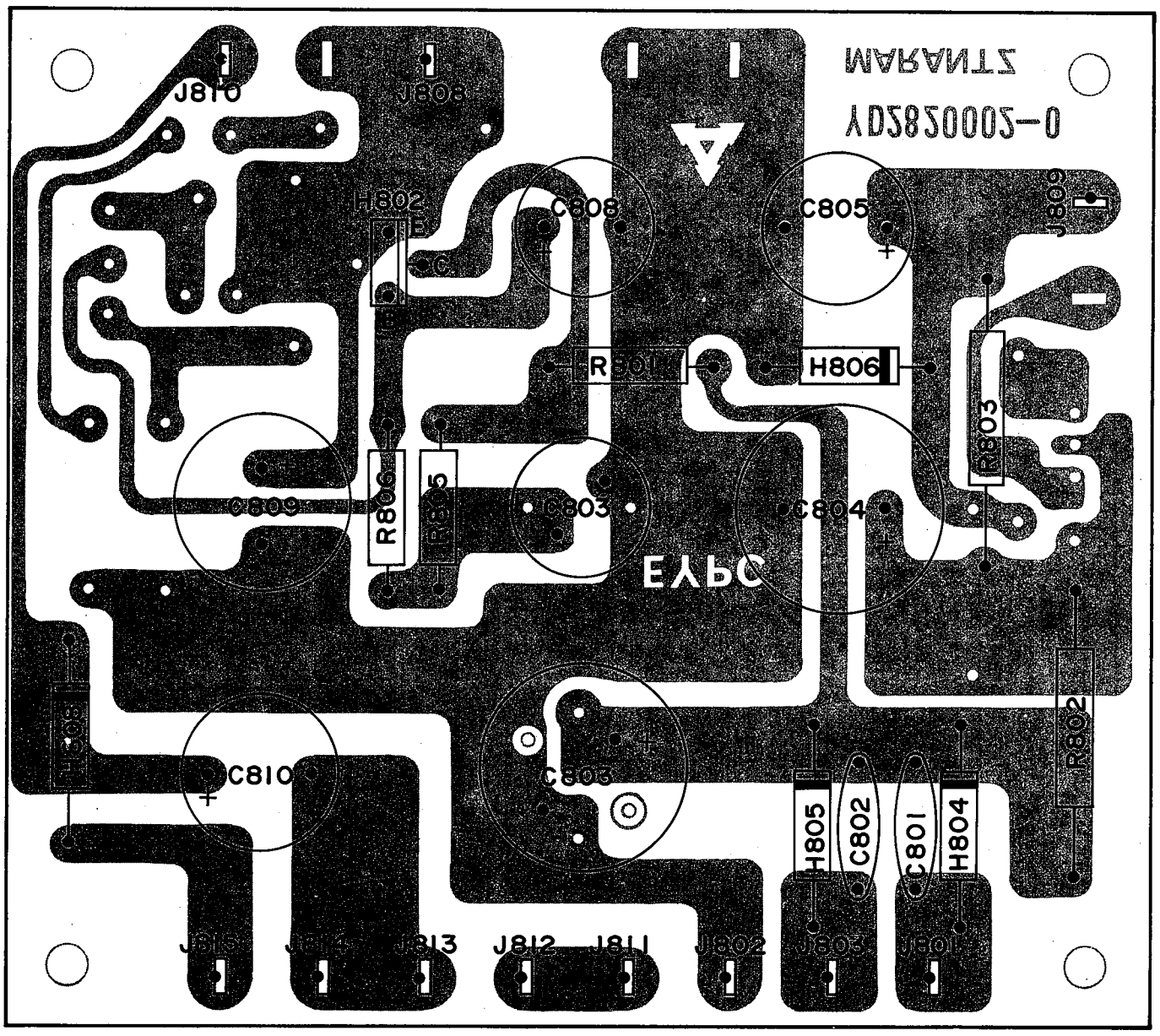


Figure 16. Power Supply Assembly P800 Component Locations

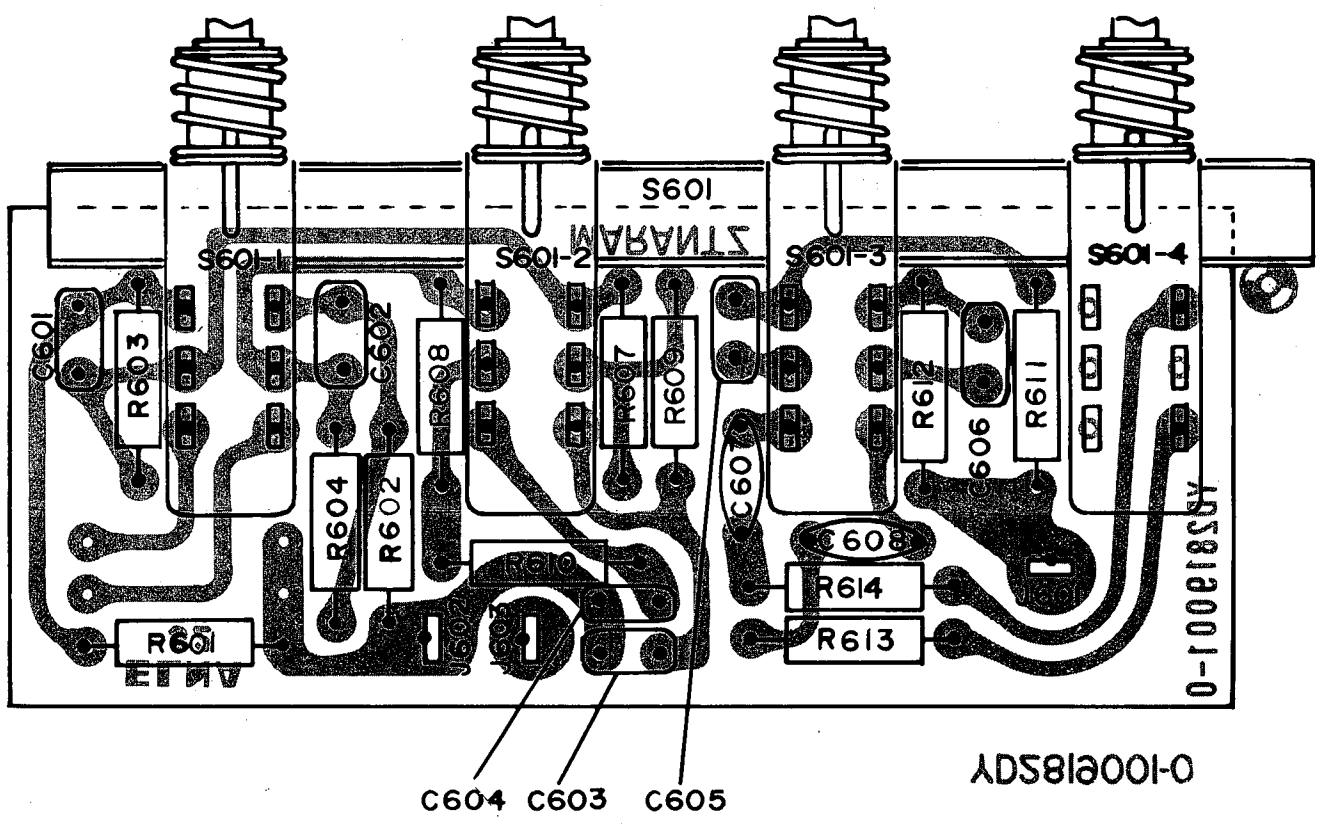
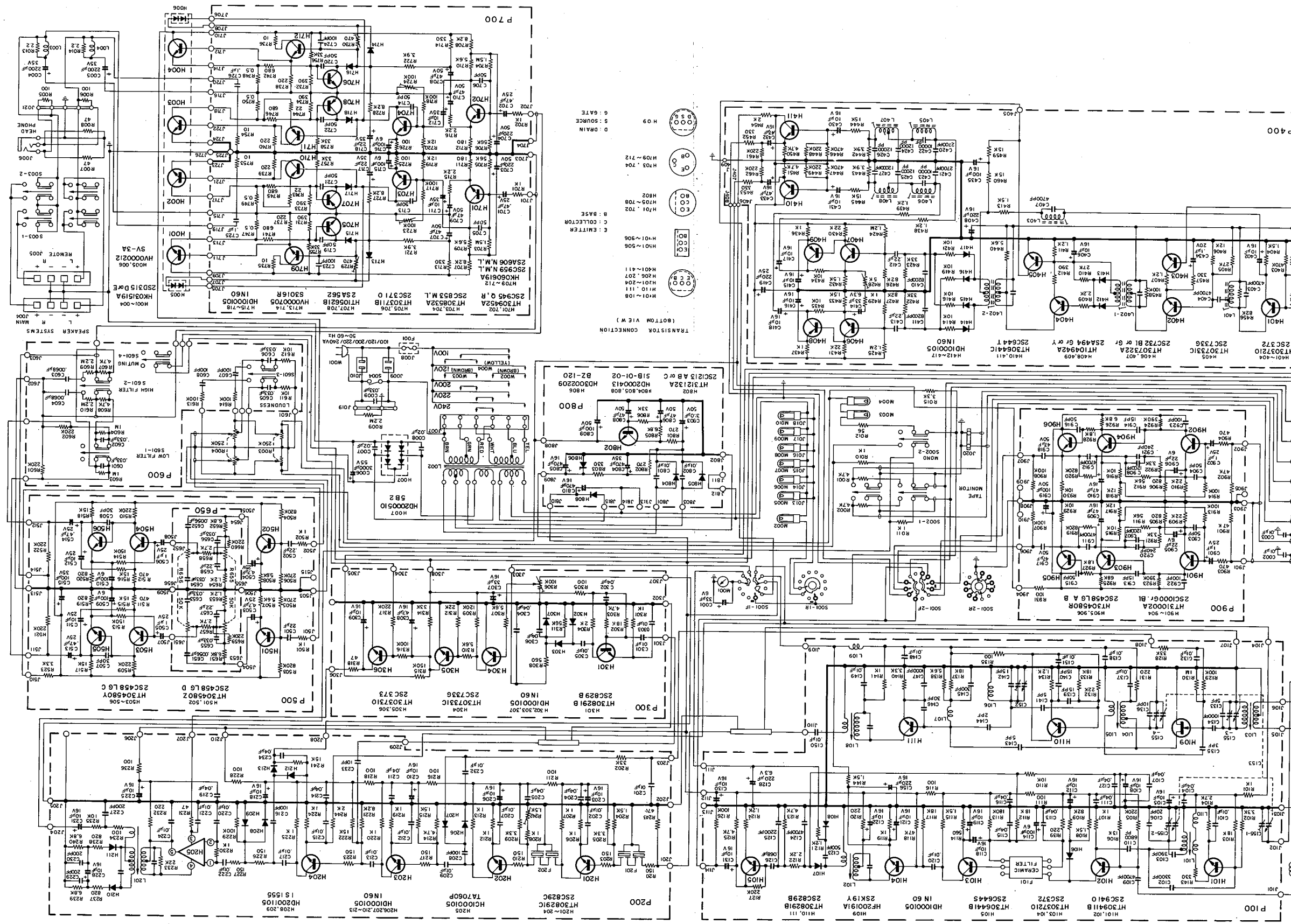


Figure 17. Loudness, Muting, High and Low Filter Switch Unit Assembly P600 Component Locations

Figure 18. Schematic Diagram



marantz®

SERVICE BULLETIN

model number 2215	bulletin number M-2215-A
for serial numbers All	
subject: LOW HEADPHONE OUTPUT	
engineering approval /s/ D. Hadley 12/7/71	date 10-21-71

You may receive customer complaints regarding low headphone output in the Model 2215, particularly when low efficiency headphones are used. The output may be raised to almost any desired level, by reducing the value of R005 and R006 from 100 ohms to the value producing the desired level.

We suggest that the resistor value not be reduced beyond 33 ohms as the signal to noise ratio will become unsatisfactory.

The mentioned modification is recommended and should be performed ONLY if the customer complaint fits specifically to the case above.

M2-005

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
A	282140140	Frame Assembly
0102	282106301	Escutcheon
0202	281840101	Frame
0204	281815801	Window
0215	273125901	Bush x 3
0219	282105302	Cover
0226	281825905	Bush x 9
B	282116040	Front Bracket Assembly
0311	281816001	Bracket
0206	281811801	Spacer
C	282116041	Rear Bracket Assembly
0313	282116002	Bracket
0902	55060305F	T.R. Rivet x 6
0905	55060365F	T.R. Rivet x 4
J009	YJ0400018	Jack, AC outlet
J010	YJ0400018	Jack, AC outlet
J004	YT0304002	Terminal, Push type 4P, SPK
J005	YT0304002	Terminal, Push type 4P, SPK
J002	YT0208002	Terminal, 8P
0104	281815401	Knob x 8
0106	281815402	Knob
0108	281815403	Knob x 5
0117	281825701	Lid
0118	281825702	Lid
0121	257706302	Escutcheon
0122	257706303	Escutcheon
0123	257727301	Fly Wheel
0126	282126501	Indicator
0131	281912002	Insulator
0208	281810701	Sheet
0210	281810301	Pointer
0211	281810302	Pointer
0212	281805301	Cover
0217	275905701	Leg x 4
0221	282130201	Dial
0302	282110550	Chassis K
0313	282116002	Bracket
0315	281816003	Bracket
0316	281816004	Bracket
0317	281816051	Bracket K
0321	281805501	Collar x 3
0326	282127401	Reflector
0327	281927401	Reflector
0329	281827101	Holder
0331	281927101	Holder
0333	281927102	Holder
0401	281805101	Guide
0403	281816005	Bracket
0406	281810650	Bearing K
0410	257811202	Shaft

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0412	281826250	Pulley K
0417	281826251	Pulley K
0422	257912001	Insulator
0425	141511801	Spacer
0426	257710602	Bearing
0431	281905350	Cover K
0501	257816052	Bracket K
0506	145525901	Bush x 2
0510	281816006	Bracket
0516	282126701	Heat Sink
0518	281810104	Support x 4
0520	282016007	Bracket x 2
0524	257711806	Spacer x 4
0530	282026702	Heat Sink x 2
0601	281800450	Table K
0612	282110901	Shield x 3
0616	282112001	Insulator
0621	257905502	Collar x 4
0629	282126901	Protector
0630	282126902	Protector
0631	281810104	Support x 4
0632	282116001	Bracket
0633	282110101	Support x 2
0634	282116003	Bracket
0701	281915901	Drum
0703	71101569M	Spring
0706	282010701	Sheet
0711	120225801	Hook
0716	273025901	Bush x 4
0718	138200503	Clamper x 15
0722	72081602A	String x 120
0723	54010089R	Washer
0725	257711803	Spacer x 4
0729	282111801	Spacer
0732	282100501	Clamper
0734	281927103	Holder
0802	51570305B	P.H. Tapt Screw x 8
0804	51570306B	P.H. Tapt Screw x 6
0806	51570312B	P.H. Tapt Screw x 3
0807	54050300R	T.L. Washer OR x 2
0808	51100306E	B.H.M. Screw x 2
0809	51040306A	F.H.M. Screw x 2
0810	51640412D	Set Screw C.P
0811	54040402A	Spring Washer
0812	53110403E	Hexagon Nut
0814	51570408B	P.H. Tapt Screw x 6
0815	51570306B	P.H. Tapt Screw x 4
0816	51570306B	P.H. Tapt Screw x 6
0818	51042606S	F.H.M. Screw x 5
0820	51570306B	P.H. Tapt Screw x 3
0821	51570306B	P.H. Tapt Screw x 3
0822	51570306B	P.H. Tapt Screw

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0824	51570306B	P.H. Tapt Screw x 2
0825	51570306B	P.H. Tapt Screw x 4
0831	53110603A	Hexagon Nut
0832	54040602A	Spring Washer
0833	54020601E	Flat Washer P
0835	53110303E	Hexagon Nut
0902	51100308S	B.H.M. Screw x 6
0903	53110303E	Hexagon Nut x 6
0904	51100306S	B.H.M. Screw x 2
0905	55060307F	T.R. Rivet x 4
0906	54050300R	T.L. Washer OR x 4
0909	51100306S	B.H.M. Screw x 6
0910	51100306S	B.H.M. Screw x 3
0911	51100306S	B.H.M. Screw x 2
0912	51100306S	B.H.M. Screw x 2
0913	51100306S	B.H.M. Screw x 2
0914	51570312B	P.H. Tapt Screw x 4
0919	51100310S	B.H.M. Screw x 2
0920	54050300R	T.L. Washer OR x 2
0921	53110303E	Hexagon Nut x 2
0923	54050400R	T.L. Washer OR
0926	51122608E	T.H.M. Screw x 4
0928	51100406S	B.H.M. Screw x 10
0930	51100406S	B.H.M. Screw x 4
0931	54020401S	Flat Washer P x 4
0933	51570410B	P.H. Tapt Screw x 4
0934	54040402N	Spring Washer x 4
0935	54020401E	Flat Washer P x 4
1002	51570305B	P.H. Tapt Screw x 8
1003	51570306B	P.H. Tapt Screw x 4
1013	51100306S	B.H.M. Screw x 4
1015	51100308S	B.H.M. Screw x 2
1026	51570408B	P.H. Tapt Screw x 4
1027	53110403A	Hexagon Nut x 4
1028	54020401A	Flat Washer P x 4
1031	51570408B	P.H. Tapt Screw x 4
1032	53110401A	Hexagon Nut x 4
1033	54020401A	Flat Washer P x 8
1034	62031650W	Lug x 5
1035	54050300R	T.L. Washer OR x 10
1102	51100306S	B.H.M. Screw x 4
1103	51100306S	B.H.M. Screw x 4
1104	51100306S	B.H.M. Screw x 4
1105	51100306S	B.H.M. Screw x 4
1106	51100306S	B.H.M. Screw x 5
1108	51100306S	B.H.M. Screw x 4
1110	51100306S	B.H.M. Screw x 4
1112	53110403A	Hexagon Nut x 4
1113	54040402A	Spring Washer x 4
1121	51570306B	P.H. Tapt Screw x 6
1122	51570306B	P.H. Tapt Screw x 2
1127	51570312B	P.H. Tapt Screw x 2

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
1129	51570306B	P.H. Tapt Screw x 10
1130	51570306B	P.H. Tapt Screw x 10
1202	51650304D	Set Screw H.P. x 2
1204	53110403E	Hexagon Nut
1206	54060300R	T.L. Washer IR x 5
1212	56382540G	Eyelet
1216	51100310S	B.H.M. Screw x 2
1217	53110303E	Hexagon Nut x 2
1218	54050300R	T.L. Washer OR x 2

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
P100	YD2821001	P.C. Board
	(ZZ2821001)	P.C. Board Assembly
		RESISTORS
R101	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R102	RT1033214	Carbon, 3.3KΩ, ±10%, 1/4W
R103	RT1018314	Carbon, 18KΩ, ±10%, 1/4W
R104	RT1022214	Carbon, 2.7KΩ, ±10%, 1/4W
R105	RT1022414	Carbon, 220KΩ, ±10%, 1/4W
R106	RT1013314	Carbon, 13KΩ, ±10%, 1/4W
R107	RT1022214	Carbon, 2.2KΩ, ±10%, 1/4W
R108	RT1015214	Carbon, 1.5KΩ, ±10%, 1/4W
R109	RT1082314	Carbon, 82KΩ, ±10%, 1/4W
R110	RT1010314	Carbon, 10KΩ, ±10%, 1/4W
R111	RT1010114	Carbon, 100Ω, ±10%, 1/4W
R112	RT1018314	Carbon, 18KΩ, ±10%, 1/4W
R113	RT1018414	Carbon, 180KΩ, ±10%, 1/4W
R114	RT1056114	Carbon, 560Ω, ±10%, 1/4W
R115	RT1015214	Carbon, 1.5KΩ, ±10%, 1/4W
R116	RT1010114	Carbon, 100Ω, ±10%, 1/4W
R117	RT1018314	Carbon, 18KΩ, ±10%, 1/4W
R118	RT1047314	Carbon, 47KΩ, ±10%, 1/4W
R119	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R120	RT1022114	Carbon, 220Ω, ±10%, 1/4W
R121	RT1012214	Carbon, 1.2KΩ, ±10%, 1/4W
R122	RT1022214	Carbon, 2.2KΩ, ±10%, 1/4W
R123	RT1047214	Carbon, 4.7KΩ, ±10%, 1/4W
R124	RT1018214	Carbon, 1.8KΩ, ±10%, 1/4W
R125	RT1047214	Carbon, 4.7KΩ, ±10%, 1/4W
R126	RT1010414	Carbon, 100KΩ, ±10%, 1/4W
R127	RT1022414	Carbon, 220KΩ, ±10%, 1/4W
R128	RT1033314	Carbon, 33KΩ, ±10%, 1/4W
R129	RT1010414	Carbon, 100KΩ, ±10%, 1/4W
R130	RT1010514	Carbon, 1MΩ, ±10%, 1/4W
R131	RT1022114	Carbon, 220Ω, ±10%, 1/4W
R132	RT1022314	Carbon, 22KΩ, ±10%, 1/4W
R133	RT1018314	Carbon, 18KΩ, ±10%, 1/4W
R134	RT1012214	Carbon, 1.2KΩ, ±10%, 1/4W
R135	RT1010114	Carbon, 100Ω, ±10%, 1/4W
R137	RT1018314	Carbon, 18KΩ, ±10%, 1/4W
R138	RT1056214	Carbon, 5.6KΩ, ±10%, 1/4W
R139	RT1022114	Carbon, 220Ω, ±10%, 1/4W
R140	RT1033214	Carbon, 3.3KΩ, ±10%, 1/4W
R141	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R142	RT1013314	Carbon, 13KΩ, ±10%, 1/4W
R143	RT1033114	Carbon, 330Ω, ±10%, 1/4W
R144	RT1015214	Carbon, 1.5KΩ, ±10%, 1/4W
		CAPACITORS
C101	DF1710301	Mylar, 0.01μF, ±20%
C102	DF1633201	Mylar, 3300pF, ±10%
C103	DF6536150	Mylar, 360pF, ±5%
C104	DF1740301	Mylar, 0.04μF, ±20%

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
C105	EA1060169	Elect., 10μF, 16V
C106	DD1620004	Ceramic, 20pF, ±10%,
C107	DF1740301	Mylar, 0.04μF, ±20%
C108	EA1060169	Elect., 10μF, 16V
C109	DF1747201	Mylar, 4700pF, ±20%
C110	DF1668201	Mylar, 6800pF, ±10%
C111	DF1740301	Mylar, 0.04μF, ±20%
C112	EA1060169	Elect., 10μF, 16V
C113	DF1740301	Mylar, 0.04μF, ±20%
C114	EA1070109	Elect., 100μF, 10V
C115	DF1740301	Mylar, 0.04μF, ±20%
C116	DF1740301	Mylar, 0.04μF, ±20%
C118-C119	EA1060169	Elect., 10μF, 16V
C120	DF1710301	Mylar, 0.01μF, ±20%
C121-C122	EA1060169	Elect., 10μF, 16V
C123	DD1650101	Ceramic, 500pF, ±10%
C124	DF1747201	Mylar, 4700pF, ±20%
C125	DF1722201	Mylar, 2200pF, ±20%
C126	DF1768301	Mylar, 0.068μF, ±20%
C127	DF1740301	Mylar, 0.04μF, ±20%
C128	EA2270069	Elect., 220μF, 6V
C130-C131	EA1060169	Elect., 10μF, 16V
C132	DK1710301	Ceramic, 0.01μF, ±20%
C133	DD1205001	Ceramic, 5pF, ±1pF
C134	DK1710201	Ceramic, 1000pF, ±20%
C135	DD1203001	Ceramic, 3pF, ±1pF
C136	DD1210001	Ceramic, 10pF, ±1pF
C137-C138	DK1710301	Ceramic, 0.01μF, ±20%
C139-C140	DD1615003	Ceramic, 15pF, ±10%,
C141	DD1105002	Ceramic, 5pF, ±0.5pF,
C142	DD1615005	Ceramic, 15pF, ±10%,
C143	DD1205001	Ceramic, 5pF, ±1pF
C144	DD1102004	Ceramic, 2pF, ±0.5pF,
C145	DD1530101	Ceramic, 300pF, ±5%
C146	DD1630001	Ceramic, 30pF, ±10%
C147	DK1710201	Ceramic, 1000pF, ±20%
C148-C151	DK1710301	Ceramic, 0.01μF, ±20%
C152	CT1100001	Trimmer, 1.5-11.5pF
C153	CA3200015	Variable, FM3 Gang, AM2 Gang
C154	EA3360109	Elect., 33μF, 10V
C155	CT4130001	Trimmer, 2-15pF
C156	EA2270169	Elect., 220μF, 16V
		TRANSFORMERS
L101	LO1001034	AM OSC Coil
L102	LI1001048	AM IFT
L103	LA1004606	FM Ant. Coil
L104	LK1050505	FM RF Coil
L105	LL2350505	FM Choke Coil
L106	LO1203601	FM OSC Coil
L107	LC1681001	FM Choke Coil
L108	LI1001601	FM IFT

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
L109	LC1752001	FM Choke Coil, 7.5μH
L110	LC1223001	Choke Coil
		SEMICONDUCTORS
H101-H102	HT309411B	Transistor, 2SC941 (O)
H103-H104	HT3037210	Transistor, 2SC372
H105	HT306441B	Transistor, 2SC644 (S)
H106-H108	HD1000105	Diode, 1N60
H109	HF200191A	FET, 2SK19Y
H110-H111	HT308291B	Transistor, 2SC829 B
H112	HD1000105	Diode, 1N60
		MISCELLANEOUS
F101	LI1028002	AM Ceramic Filter
J101-J114	YP1000094	Plug
W007	YW2821002	Wire Material
P200	YD2821002	P.C. Board
	(ZZ2821002)	P.C. Board Assembly
		RESISTORS
R201	RT1015114	Carbon, 150Ω, ±10%, 1/4W
R202	RT1033314	Carbon, 33KΩ, ±10%, 1/4W
R203	RT1015114	Carbon, 150Ω, ±10%, 1/4W
R204	RT1015214	Carbon, 1.5KΩ, ±10%, 1/4W
R205	RT1033214	Carbon, 3.3KΩ, ±10%, 1/4W
R206-R208	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R209	RT1033214	Carbon, 3.3KΩ, ±10%, 1/4W
R210	RT1015114	Carbon, 150Ω, ±10%, 1/4W
R211	RT1010114	Carbon, 100Ω, ±10%, 1/4W
R212-R213	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R214	RT1047214	Carbon, 4.7KΩ, ±10%, 1/4W
R215	RT1015314	Carbon, 15KΩ, ±10%, 1/4W
R216	RT1010114	Carbon, 100Ω, ±10%, 1/4W
R217	RT1015114	Carbon, 150Ω, ±10%, 1/4W
R218	RT1010114	Carbon, 100Ω, ±10%, 1/4W
R219-R220	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R221	RT1082214	Carbon, 8.2KΩ, ±10%, 1/4W
R222	RT1015314	Carbon, 15KΩ, ±10%, 1/4W
R223	RT1015114	Carbon, 150Ω, ±10%, 1/4W
R224-R225	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R226-R227	RT1015114	Carbon, 150Ω, ±10%, 1/4W
R228	RT1010114	Carbon, 100Ω, ±10%, 1/4W
R229	RT1010414	Carbon, 100KΩ, ±10%, 1/4W
R230	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R231	RT1047014	Carbon, 47Ω, ±10%, 1/4W
R232	RT1022114	Carbon, 220Ω, ±10%, 1/4W
R233	RT1022314	Carbon, 22KΩ, ±10%, 1/4W
R234	RT1010114	Carbon, 100Ω, ±10%, 1/4W
R235	RT1010314	Carbon, 10KΩ, ±10%, 1/4W
R236	RT1010114	Carbon, 100Ω, ±10%, 1/4W
R237-R238	RT1082114	Carbon, 820Ω, ±10%, 1/4W
R239-R240	RT1068214	Carbon, 6.8KΩ, ±10%, 1/4W

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R241	RT1015314	Carbon, 15KΩ, ±10%, 1/4W
R242	RA0152004	Trimmer, 1.5KΩ, (B)
R243	RT1047114	Carbon, 470Ω, ±10%, 1/4W
R244	RT1020214	Carbon, 2KΩ, ±10%, 1/4W
		CAPACITORS
C201-C202	DK1710301	Ceramic, 0.01μF, ±20%
C203	EA1060169	Elect., 10μF, 16V
C204-C205	DK1840302	Ceramic, 0.04μF, +80%, −20%
C206	EA1060169	Elect., 10μF, 16V
C207	DK1710301	Ceramic, 0.01μF, ±20%
C208	DD1510101	Ceramic, 100pF, ±5%
C209	DK1710301	Ceramic, 0.01μF, ±20%
C210	EA1060169	Elect., 10μF, 16V
C211	DK1840302	Ceramic, 0.04μF, +80%, −20%
C212-C213	DK1710301	Ceramic, 0.01μF, ±20%
C214	DK1840302	Ceramic, 0.04μF, +80%, −20%
C215	DK1710301	Ceramic, 0.01μF, ±20%
C216	DD1510101	Ceramic, 100pF, ±5%
C217	DK1710301	Ceramic, 0.01μF, ±20%
C218	EA1060169	Elect., 10μF, 16V
C219	DK1840302	Ceramic, 0.04μF, +80%, −20%
C220-C222	DK1710301	Ceramic, 0.01μF, ±20%
C224	DK1710301	Ceramic, 0.01μF, ±20%
C225	EA1060169	Elect., 10μF, 16V
C227	DD1620101	Ceramic, 200pF, ±10%
C228	EA1060169	Elect., 10μF, 16V
C229-C230	DD1620101	Ceramic, 200pF, ±10%
C231	EA1060169	Elect., 10μF, 16V
C232	DK1710301	Ceramic, 0.01μF, ±20%
C233	DD1210001	Ceramic, 10pF, ±1pF
C234	DK1840302	Ceramic, 0.04μF, +80%, −20%
		MISCELLANEOUS
F201-F202	FF1107001	Caramic, SFC 10.7MA
L201	LI1018801	IFT, FM Det.
		SEMICONDUCTORS
H201-H204	HT308291C	Transistor, 2SC 829 (C)
H205	HC1000105	IC, TA7060P
H206-H207	HD1000105	Diode, 1N60
H208-H209	HD2001105	Diode, 1S1555
H210-H213	HD1000105	Diode, 1N60
		MISCELLANEOUS
J201-J210	YP1000094	Plug
P300	YD2821003	P.C. Board
	(ZZ2821003)	P.C. Board Assembly
		RESISTORS
R301	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R302	RT1018314	Carbon, 18KΩ, ±10%, 1/4W
R303	RT1047214	Carbon, 4.7KΩ, ±10%, 1/4W
R304	RT1020214	Carbon, 2KΩ, ±10%, 1/4W

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R305	RT1010114	Carbon, 100Ω, ±10%, 1/4W
R306	RA0104014	Trimmer, 100KΩ, B
R307	RT1056214	Carbon, 5.6KΩ, ±10%, 1/4W
R308	RT1056114	Carbon, 560Ω, ±10%, 1/4W
R309	RT1012414	Carbon, 120KΩ, ±10%, 1/4W
R310	RT1056214	Carbon, 5.6KΩ, ±10%, 1/4W
R311	RT1056314	Carbon, 56KΩ, ±10%, 1/4W
R312	RT1022314	Carbon, 22KΩ, ±10%, 1/4W
R314	RT1033314	Carbon, 33KΩ, ±10%, 1/4W
R315	RT1015414	Carbon, 150KΩ, ±10%, 1/4W
R316	RT1010414	Carbon, 100KΩ, ±10%, 1/4W
R317	RT1022414	Carbon, 220KΩ, ±10%, 1/4W
R318	RT1047014	Carbon, 47Ω, ±10%, 1/4W
		MISCELLANEOUS
J301-J308	YP1000094	Plug
		CAPACITORS
C301	DK1710301	Ceramic, 0.01μF, ±20%
C302	DK1840302	Ceramic, 0.04μF, +80%, −20%
C303	DK1710301	Ceramic, 0.01μF, ±20%
C304	DK1840302	Ceramic, 0.04μF, +80%, −20%
C305	DK1710301	Ceramic, 0.01μF, ±20%
C306	DK1840301	Ceramic, 0.04μF, +80%, −20%
C307	EA3360259	Elect., 33μF, 25V
C308	EA4750359	Elect., 4.7μF, 35V
C309	EA1060169	Elect., 10μF, 16V
		SEMICONDUCTORS
H301	HT308291B	Transistor, 2SC829 (B)
H302-H303	HD1000105	Diode, 1N60
H304	HT307331C	Transistor, 2SC733 G
H305-H306	HT3037310	Transistor, 2SC373
H307	HD1000105	Diode, 1N60
P400	YD2821004	P.C. Board
	(ZZ2821004)	P.C. Board Assembly
		RESISTORS
R401	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R402-R403	RT1047414	Carbon, 470KΩ, ±10%, 1/4W
R404	RT1015214	Carbon, 1.5KΩ, ±10%, 1/4W
R405	RT1027314	Carbon, 27KΩ, ±10%, 1/4W
R406	RT1012314	Carbon, 12KΩ, ±10%, 1/4W
R407	RT1012214	Carbon, 1.2KΩ, ±10%, 1/4W
R409	RT1022214	Carbon, 2.2KΩ, ±10%, 1/4W
R410	RT1027314	Carbon, 27KΩ, ±10%, 1/4W
R411	RT1012214	Carbon, 1.2KΩ, ±10%, 1/4W
R412	RT1039114	Carbon, 390Ω, ±10%, 1/4W
R413	RT1015214	Carbon, 1.5KΩ, ±10%, 1/4W
R414	RT0510314	Carbon, 10KΩ, ±5%, 1/4W
R416	RT0510314	Carbon, 10KΩ, ±10%, 1/4W
R419	RT0510314	Carbon, 10KΩ, ±10%, 1/4W
R421	RT0510314	Carbon, 10KΩ, ±10%, 1/4W
R422-R423	RT0533314	Carbon, 33KΩ, ±10%, 1/4W

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R424-R425	RT0512514	Carbon, 1.2MΩ, ±10%, 1/4W
R426-R427	RT0582314	Carbon, 82KΩ, ±10%, 1/4W
R428	RA0502013	Trimmer, 5KΩ, B
R429	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R430	RT0522314	Carbon, 22KΩ, ±5%, 1/4W
R431	RT0522314	Carbon, 22KΩ, ±5%, 1/4W
R432-R433	RT0515214	Carbon, 1.5KΩ, ±5%, 1/4W
R434-R435	RT0510314	Carbon, 10KΩ, ±5%, 1/4W
R436-R437	RT0510214	Carbon, 1KΩ, ±5%, 1/4W
R438-R439	RT0512214	Carbon, 1.2KΩ, ±5%, 1/4W
R440-R441	RT1056214	Carbon, 5.6KΩ, ±5%, 1/4W
R442-R443	RT0539214	Carbon, 3.9KΩ, ±5%, 1/4W
R444-R445	RT0515314	Carbon, 15KΩ, ±5%, 1/4W
R446-R447	RT1047414	Carbon, 470KΩ, ±10%, 1/4W
R448-R449	RT1022414	Carbon, 220KΩ, ±10%, 1/4W
R450-R451	RT1047214	Carbon, 4.7KΩ, ±10%, 1/4W
R452-R453	RT1033114	Carbon, 330Ω, ±10%, 1/4W
R454	RT1012214	Carbon, 1.2KΩ, ±10%, 1/4W
R455	RT1022114	Carbon, 220Ω, ±10%, 1/4W
R456	RT1082314	Carbon, 82KΩ, ±10%, 1/4W
R457	RT1033114	Carbon, 330Ω, ±10%, 1/4W
R458	RT1010414	Carbon, 100KΩ, ±10%, 1/4W
R459-R460	RT1015314	Carbon, 15KΩ, ±10%, 1/4W
R461-R462	RT1022414	Carbon, 220KΩ, ±10%, 1/4W
		CAPACITORS
C401-C402	EA1060169	Elect., 10μF, 16V
C403	DF5547203	Mylar, 4700pF, ±5%
C404	DF1647201	Mylar, 4700pF, ±10%
C406	EA1060169	Elect., 10μF, 16V
C407	DF5547201	Mylar, 4700pF, ±5%
C408	EA2270169	Elect., 220μF, 16V
C410-C411	DF1582201	Mylar, 8200pF, ±5%
C412-C413	DF1722401	Mylar, 0.22μF, ±20%
C414	EA3360109	Elect., 33μF, 10V
C415-C418	EA1060169	Elect., 10μF, 16V
C419	EA2270359	Elect., 220μF, 35V
C420-C421	DF1627201	Mylar, 2700pF, ±10%
C422-C423	DF1610301	Mylar, 10000pF, ±10%
C424-C427	DF1612301	Mylar, 12000pF, ±10%
C430-C431	EA1060169	Elect., 10μF, 16V
C432-C433	EV4740251	Elect., 0.47μF, 25V
C434	EM1040201	Elect., 0.1μF, 20V
C435	EA1070169	Elect., 10μF, 16V
		TRANSFORMERS
L401	LS1001007	M.P.X Coil, 19KHz Amp.
L402	LS1503002	M.P.X Coil, 19KHz, 38KHz Block
L403	LS1001505	M.P.X Coil, 67KHz Trap.
L405-L406	LS1029002	M.P.X Coil, L.P. Filter
L407-L408	LS1029003	M.P.X Coil, L.P. Filter
		SEMICONDUCTORS
H401-H404	HT3037210	Transistor, 2SC372

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
H405	HT307331C	Transistor, 2SC733 G
H406-H407	HT307322A	Transistor, 2SC732 Blu or Grn
H408-H409	HT104942A	Transistor, 2SA494 Gr or Y
H410-H411	HT306441C	Transistor, 2SC644 T
H412-H417	HD1000105	Diode, 1N60
		MISELLANEOUS
J401-J409	YP1000094	Plug
P900	YD2821008	P.C. Board
	(ZZ2821008)	P.C. Board Assembly
		RESISTORS
R901-R902	RT0547314	Carbon, 47KΩ, ±5%, 1/4W
R903-R904	RT1047114	Carbon, 470Ω, ±10%, 1/4W
R905-R906	RT0582114	Carbon, 820Ω, ±5%, 1/4W
R907-R908	RT0510414	Carbon, 100KΩ, ±5%, 1/4W
R909-R910	RT0522314	Carbon, 22KΩ, ±5%, 1/4W
R911-R912	RT0556314	Carbon, 56KΩ, ±5%, 1/4W
R913-R914	GT0510412	Carbon, 100KΩ, ±5%, 1/4W
R915-R916	RT0510314	Carbon, 10KΩ, ±5%, 1/4W
R917-R918	RT0512314	Carbon, 12KΩ, ±5%, 1/4W
R919-R920	GT0582412	Carbon, 820KΩ, ±5%, 1/2W
R921-R922	RT1033214	Carbon, 3.3KΩ, ±10%, 1/4W
R923-R924	GT0539412	Carbon, 390KΩ, ±5%, 1/2W
R925-R926	GT0568312	Carbon, 68KΩ, ±5%, 1/2W
R927-R928	RT1018214	Carbon, 1.8KΩ, ±10%, 1/4W
R929-R930	RT0510314	Carbon, 10KΩ, ±5%, 1/4W
R931	RT1010114	Carbon, 100Ω, ±10%, 1/4W
		CAPACITORS
C901-C902	EV1050251	Elect., 1μF, 25V, +40%, −20%
C903-C904	DD1650001	Ceramic, 50pF, 50V, ±10%
C905-C906	EV2260061	Elect., 22μF, 6V
C907-C908	DF5412201	Mylar, 1200pF, 50V, ±2%
C909-C910	EA4760169	Elect., 47μF, 16V,
C911-C912	DF5547201	Mylar, 4700pF, 25V, ±5%
C913-C914	DD1615001	Ceramic, 15pF, 50V, ±10%
C915-C916	DD1650001	Ceramic, 50pF, 50V, ±10%
C917-C918	DF1747401	Mylar, 47μF, 50V, ±20%
C919	EA1070509	Elect., 100μF, 50V,
C920-C921	DF6524150	Mylar, 240pF, 125V, 25%
C922-C923	DD1610101	Ceramic, 100pF, 50V, ±10%
		SEMICONDUCTORS
H901-H904	HT310002A	Transistor, 2SC1000, GR, BL
H905-H906	HT304580R	Transistor, 2SC 458LGA (B)
		MISCELLANEOUS
J901-J910	YP1000091	Plug
P500	YD2821005	P.C. Board
	(ZZ2821005)	P.C. Board Assembly
		RESISTORS

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R501-R502	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R503-R504	RN1082414	Carbon, 820KΩ, ±10%, 1/4W
R505-R506	RN1027414	Carbon, 270KΩ, ±10%, 1/4W
R507-R508	RT0556214	Carbon, 5.6KΩ, ±5%, 1/4W
R509-R510	RN1022414	Carbon, 220KΩ, ±10%, 1/4W
R511-R512	RT0536114	Carbon, 360Ω, ±5%, 1/4W
R513-R514	RN1015414	Carbon, 150KΩ, ±10%, 1/4W
R515-R516	RT0513314	Carbon, 13KΩ, ±10%, 1/4W
R517-R518	RT1015314	Carbon, 15KΩ, ±10%, 1/4W
R519-R520	RT1082114	Carbon, 820Ω, ±10%, 1/4W
R521-R522	RT1022414	Carbon, 220KΩ, ±10%, 1/4W
R523	RT1033214	Carbon, 3.3KΩ, ±10%, 1/4W
		CAPACITORS
C501-C502	DF1722402	Mylar, 0.22μF, ±20%
C503-C504	EA4750359	Elect., 4.7μF, 35V
C505-C506	EV1050252	Elect., 1μF, 25V
C507-C508	DD1630001	Ceramic, 30pF
C509-C510	EA1070109	Elect., 100μF, 10V
C511-C512	EA1060359	Elect., 10μF, 35V
C513-C514	EV4740251	Elect., 0.47μF, 25V
C515	EA1070359	Elect., 10μF, 35V
		SEMICONDUCTORS
H501-H502	HT304580Z	Transistor, 2SC458LG (D)
H503-H506	HT304580Y	Transistor, 2SC458LG (C)
		MISCELLANEOUS
J501-J515	YP1000091	Plug
P600	YD2819001	P.C. Board
	(ZZ2819001)	P.C. Board Assembly
		RESISTORS
R601-R602	RT1022414	Carbon, 220KΩ, ±10%, 1/4W
R603-R604	RT1010514	Carbon, 1MΩ, ±10%, 1/4W
R607-R608	RT0547214	Carbon, 4.7KΩ, ±5%, 1/4W
R609-R610	RT1022514	Carbon, 2.2MΩ, ±10%, 1/4W
R611-R612	RT0510314	Carbon, 10KΩ, ±5%, 1/4W
R613-R614	RT1010414	Carbon, 100KΩ, ±10%, 1/4W
		CAPACITORS
C601-C602	DF1733301	Mylar, 0.033μF, ±20%, 50V
C603-C604	DF1668201	Mylar, 0.0068μF, ±10%, 50V
C605-C606	DF1733301	Mylar 0.033μF, ±20%, 50V
C607-C608	DD1510101	Ceramic, 100pF, ±5%, 50V
		MISCELLANEOUS
S601	SP0204003	Push Switch Loudness, Muting
J601-J603	YP1000094	Plug
P650	YD2821006	P.C. Board
	(ZZ2821006)	P.C. Board Assembly
		RESISTORS
R651-R652	RT1068214	Carbon, 6.8KΩ, ±10%, 1/4W

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R653-R654	RT1012214	Carbon, 1.2KΩ, ±10%, 1/4W
R655-R656	RM0503038	Variable, 50KΩ, A
R657-R658	RT1027214	Carbon, 2.7KΩ, ±10%, 1/4W
R659-R660	RT1022414	Carbon, 220KΩ, ±10%, 1/4W
		CAPACITORS
C651-C652	DF1756201	Mylar, 0.0056μF, ±20%, 50V
C653-C656	DF1733301	Mylar, 0.033μF, ±20%, 50V
C657-C658	DF1722402	Mylar, 0.22μF, ±20%, 50V
		MISCELLANEOUS
J651-J656	57219520W	Plug. Eyelet
P700	YD2821007	P.C. Board
	(ZZ2821007	P.C. Board Assembly
		RESISTORS
R701-R702	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R703-R704	RN1015514	Carbon, 1.5MΩ, ±10%, 1/4W
R705-R706	RN1056314	Carbon, 56KΩ, ±10%, 1/4W
R707-R708	RC1082212	Solid, 8.2KΩ, ±10%, 1/2W
R709-R710	RT1056214	Carbon, 5.6KΩ, ±10%, 1/4W
R711-R712	GT0518112	Carbon, 180Ω, ±5%, 1/2W
R713-R714	RC1033112	Solid, 330Ω, ±10%, 1/2W
R715-R716	GT0522212	Carbon, 2.2KΩ, ±5%, 1/2W
R717-R718	RN1010414	Carbon, 100KΩ, ±10%, 1/4W
R719-R720	RT1012314	Carbon, 12KΩ, ±10%, 1/4W
R721-R722	RC1039212	Solid, 3.9KΩ, ±10%, 1/4W
R723-R724	RA0104012	Trimmer, 470Ω, B
R725-R726	RC1010112	Solid, 100Ω, ±10%, 1/2W
R727-R728	RC1082212	Solid, 8.2KΩ, ±10%, 1/2W
R729-R730	RA0501005	Trimmer, 100KΩ, B
R731-R733	RC1039112	Solid, 390Ω, ±10%, 1/2W
R734	RC1039112	Solid, 390Ω, ±10%, 1/2W
R735-R736	RC1010012	Solid, 10Ω, ±10%, 1/2W
R737-R740	RC1022112	Solid, 220Ω, ±10%, 1/2W
R741-R742	RC1068112	Solid, 680Ω, ±10%, 1/2W
R743-R744	RC1022012	Solid, 22Ω, ±10%, 1/2W
R745-R746	RC1068112	Solid, 680Ω, ±10%, 1/2W
R747-R750	GW1050202	Wire Wound, 0.5Ω, 2W
R753-R754	RC1010012	Solid, 10Ω, ±10%, 1/2W
R755-R758	RC1033312	Solid, 33KΩ, ±10%, 1/2W
		CAPACITORS
C701-C702	EV4740251	Elect., 0.47μF, 25V
C703-C704	EA2270509	Elect., 220μF, 50V
C705-C706	DD1650001	Ceramic, 50pF, 50V, ±10%
C707-C710	EA4760509	Elect., 47μF, 50V
C711-C712	EA1060359	Elect., 10μF, 35V
C713-C714	DD1650001	Ceramic, 50pF, ±10%
C715-C716	EA1070109	Elect., 10μF, 10V
C717-C718	EA2260359	Elect., 22μF, 35V
C719-C722	DD1650001	Ceramic, 50pF, ±10%
C723-C724	DF3610152	Mylar, 100pF, ±10%
C725-C726	DF1710452	Mylar, 0.1μF, 200V, ±20%

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
		SEMICONDUCTORS
H701-H702	HT309452A	Transistor, 2SC945 (Q, R)
H703-H704	HT308532A	Transistor, 2SC853 (M, L)
H705-H706	HT303711B	Transistor, 2SC371 (O)
H707-H708	HT105621B	Transistor, 2SA562 (O)
H709-H712	HK060619A	Transistor, 2SC959 , 2SA606 (N,M, L)
H713-H714	HV0000705	Varistor, S3016R
H715-H718	HD1000105	Diode, 1N60
		MISCELLANEOUS
J701-J726	YP1000091	Plug
P800	YD2821009	P.C. Board
	(ZZ2821009)	P.C. Board Assembly
		RESISTORS
R801	RC1027112	Solid, 270Ω, ±10%, 1/2W
R802	GT0527101	Carbon, 270Ω, ±5%, 1W
R803	GT0533101	Carbon, 330Ω, ±5%, 1W
R805	RC1068212	Solid, 6.8KΩ, ±10%, 1/2W
R806	RC1033312	Solid, 33KΩ, ±10%, 1/2W
		CAPACITORS
C802	DK1810351	Ceramic, 0.01μF, 500V, +100%,−10%
C803	EA3370509	Elect., 330μF, 50V
C804	EA4770359	Elect., 470μF, 35V
C805	EA4770169	Elect., 470μF, 16V
C806	EA4760509	Elect., 47μF, 50V
C808	EA4760509	Elect., 47μF, 50V
C809	EA1070509	Elect., 100μF, 50V
C810	EA4770169	Elect., 470μF, 16V
		SEMICONDUCTORS
H802	HT312132A	2SC1213A B or C
H804-H805	HD2000413	Diode, SIB-01-02
H806	HD3002209	Diode, BZ-120
H808	HD2000413	Diode, SIB-01-02
		MISCELLANEOUS
J801-J803	YP1000091	Plug
J808-J815	YP1000091	Plug
		RESISTORS
R001-R002	RT1047214	Carbon, 4.7KΩ, ±10%, 1/4W
R003	RM0254020	Variable, 250KΩ, MN
R004	RM0254021	Variable, 250KΩ, A
R005-R006	RJ1010101	Variable, 100Ω, ±10%, 1W
R007-R008	RC1047012	Solid, 47Ω, ±10%, 1/2W
R009	GT0522501	Carbon, 2.2MΩ, ±5%, 1W
R010-R011	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R012	RC1056012	Solid, 56Ω, ±10%, 1/2W
R013-R014	RC1002212	Solid, 2.2Ω, ±10%, 1/2W
R015	RT1033214	Carbon, 3.3KΩ, ±10%, 1/4W
		CAPACITORS
C001	EA3360109	Elect., 33μF, 10V
C002-C003	DK1710301	Ceramic, 0.01μF, 50V

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
C004-C005	EC2280352	Ceramic, 2200μF, 35V
C006	EC3080552	Ceramic, 3000μF, 55V
C007-C008	DO0720350	Oil Paper, 0.02μF, ±20% 600V,
C009	DO0733380	Oil Paper, 0.033μF, ±20%, 800VAC
		TRANSFORMERS
L001	LF1120024	AM Ant. Coil
L002	TS1850201	Power Transf.
L003-L004	LL2291512	Choke Coil
L005	LC1302001	Choke Coil
L006	LC1682001	Choke Coil
		SEMICONDUCTORS
H001-H002	HK031519A	Transistor, 2SD315 (DE) Pair
H003-H004	HK031519A	Transistor, 2SD315 (DE) Pair
H005-H006	HV0000212	Varistor, SU-3A
H007	HD2000510	Diode, 5B2
		MISCELLANEOUS
M001	IM1104203	AM/FM Signal Meter
M002	IN1008018	Lamp, 8V 0.06A Dial Pointor
M003-M004	IN1006301	Lamp, 6.3V 0.04A Stereo
M005-M010	IN1008007	8V, 0.24A, Dial Illumination Lamp
S001	SR0704001	Function Switch
S002	SP0402003	Tape Monitor Switch
S003	SP0402004	Main, Remote Switch
S004	SP0201010	Push Switch AC ON OFF
J001	YT0104011	Terminal for AM, FM Ant.
J003	YT0101003	Ground Terminal
J006	YJ0100065	Headphone Jack
J007	YL0106004	Terminal
J008	YJ0800012	Fuse Holder Socket
J013-J018	YJ0800013	Dial Illumination Jack
J019	YL0104001	Terminal
J020	YL0102003	Terminal
J021	YL0105001	Terminal
F001	FS1020004	Fuse, UL, 2A
W001	YC0240010	AC Cord
W002-W004	YB0027001	Connective Cord
W005	YW2821001	Wire Material
W006	YX2821001	Wire Material

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SPECIFICATIONS

Audio Circuits:

Rated continuous (RMS) power output
per channel, both channels operating simultaneously, ... 15 Watts at 4 and 8 ohms
10 Watts at 16 ohms
Comparable Total Music Power (IHF) ..... 45 Watts at 8 ohms
High-level hum and noise (ref. 15 Watts at 8 ohms) ..... −77dB
Phono hum and noise ..... 1.5 μV equivalent input
Dynamic range (phono input to tape recording output) 96dB
I.M. Distortion(SMPTE), at rated power 0.9%
Distortion decreases as output is lowered
Total Harmonic Distortion, at rated power ..... o.9% Maximum
Distortion decreases as output is lowered
Power Bandwidth (IHF) for 0.9% THD ..... 15 Hz to 50,000 Hz
Damping Factor (ref. 8 ohms) ..... Greater than 45
Frequency Response
Through phono 1.0dB
Input Sensitivity (for 15 Watts at 8 ohms)
High-level ..... 180 mV
Phono (1,000 Hz) ..... (1,000 Hz) 1.8mV
Input Impedance
High-level ..... 100,000 ohms
Phono ..... 47,000 ohms
Channel Separation 20 Hz to 20,000 Hz ..... 35 dB Minimum

FM Sections:

IHF Usable Sensitivity ..... 3.0 μV
Selectivity ..... 50 dB
Noise Quieting ..... −60 dB at 1.000 μV
Total Harmonic Distortion, 400 Hz, 100% Mod ..... 0.4% Maximum
Frequency Response (ref. 75 μ sec. de-emphasis) ..... ±1dB 50 Hz to 15KHz
Stereo Separation ..... 1,000 Hz 40 dB
Sub Carrier (38 KHz) Suppression ..... 60 dB

General:

Power Requirements ..... 100/120/200/220/240V AC
50 to 60 Hz
At rated output, both channels operating ..... 110 Watts
Idling Power (Volume Control at zero) 29Watts

Dimensions
Panel Width ..... 17 $^{21}/_{64}$ Inches
Panel Height ..... 5 $^{25}/_{64}$ Inches
Depth ..... 14 Inches
Weight
Unit alone 24.6lbs
Packed for shipment 34.6lbs

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

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