

SERVICE MANUAL

marantz

model 4230

Stereo 2 + Quadradial 4 Receiver

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INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model 4230 Stereo 2 + Quadradial 4 Receiver.

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 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 from the circuit diagram, the chassis of Model 4230 consists of 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 and AM Tuner mounted on P.W. Board, P100
2. Phono Amplifier mounted on P.W. Board, P400
3. Vari-Matrix Unit mounted on P.W. Board, P500
4. Dolby Unit mounted on P.W. Board, P600
5. Power Amplifier mounted on P.W. Board, P700
6. Power Supply mounted on P.W. Board, P800
7. FM De-emphasis Switch Unit mounted on P.W. Board, PC01
8. Buffer Amplifier mounted on P.W. Board, PD01
9. Tone Amplifier mounted on P.W. Board, PE01
10. Tone Control Unit mounted on P.W. Board, PF01
11. Balance Control Unit mounted on P.W. Board, PG01
12. 400Hz Oscillator and Meter Driver mounted on P.W. Board, PL01
13. Loudness, Hi Filter, Speaker and Power Switch Unit mounted on P.W. Board, PS01
14. Tape Monitor Switch Unit mounted on P.W. Board, PT01
15. Indicator Lamps mounted on P.W. Board, PY01
16. Dial Lamps mounted on P.W. Board, PZ01

2. AM TUNER

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

The AM signals induced in a ferrite bar antenna are applied to the base of converter transistor H113 through a capacitor of C171, while the local oscillator voltage is injected to the emitter of H113 through a capacitor C172. Both AM signals and oscillating voltage are mixed at the base-emitter junction and converted into 455KHz intermediate frequency. The resulting IF signal is applied to the first IF transformer L116 consisting of one ceramic filter and two tuned circuits.

The output of L116 is led to the transistor H104 which in turn apply its output to the transistor of next stage H105. The fully amplified IF output is then applied to the diode H123 to detect audible signal through the detector transformer L117. The detected audio signal is filtered and the final audio output is obtained from pin terminal J118 and applied to the audio amplifier section through the SELECTOR switch.

The DC component of the detected IF signal is used as a AGC voltage to control emitter current of H104 through the resistor R185. A part of IF signal output is also applied to the diode H124 through a capacitor C180 and rectified to obtain DC current for energizing the SIGNAL STRENGTH meter M004.

2.1 Suggestions for AM Tuner Trouble Shooting

Check for broken AM bar antenna, next try to tune station by rotating fly-wheel tuning knob

slowly and observe the SIGNAL STRENGTH meter whether it deflects or not. If the SIGNAL STRENGTH meter gives a deflection at several frequencies received, no failure may exist in the stages at least preceding final IF transformer L117. Next connect a oscilloscope to the pin terminal J118 and check for audio signals with the tuning meter deflected. If the SIGNAL STRENGTH meter does not deflect, check the local oscillator circuit. Normal oscillating voltage at the hot end of the oscillator tuning capacitor is about 2 or 3 volts, varying with tuning capacitor position. When measuring oscillating voltage use a RF VTVM, no circuit tester gives correct indication.

3. FM TUNER

All components are mounted on a printed circuit board P100.

FM signals induced by a FM antenna are led to FM antenna coil L101.

These signals are then applied to the FET RF amplifier which in turn applies its output to the next transistor mixer H102 through a high Q tuned circuit.

The mixer convert its input signal into 10.7MHz intermediate frequency and amplifies it at the same time. The H103 is a local oscillator and its output is injected into the base of mixer transistor, the injection voltage is about 40mV.

The 10.7MHz front end output is led to the next IF section. The IF section consists of five stage of IF amplifier and one stage of sub IF amplifier. Two pieces of ceramic filters are also used to obtain high selectivity, a pair of symmetrical diode limiters are also employed for the best limiting characteristics, improved capture ratio and good AM suppression. A part of IF amplifier H105 output is rectified by the diode H115, H116 and its DC output is fed back to the gate of FET RF amplifier to decrease the gain with increased 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 4230.

The DC voltage obtained by rectifying the sub IF output signal from the H109 is applied to the base of H110 and turns on it, if the sub IF output is greater than predetermined level (muting threshold level).

When H110 turns on, the muting switch transistor H111 turned on, thus decreasing the emitter collector resistance to near zero ohm and allowing emitter current path to the final IF amplifier H108.

When the input signal is lower than the predetermined level, the DC output obtained is small and can not turn on the H110, thus the H110 keeps its turn off state and this makes the switch transistor H111 keep turn off, then no emitter current is supplied to the H108 and signals below threshold level are muted out.

The muting threshold level can be varied by adjusting the trimming resistor R153.

The DC voltage obtained is also used to make the Auto-Stereo switching transistor H112 turn on and off, and used to energizing the SIGNAL STRENGTH meter M004.

3.2 MPX Stereo Decoding Circuit

A Non-equalized audio signal from the FM detector is applied through the phase adjuster network of C148 and R161 to input terminal pin ① on the MPX decoder IC H114. The MPX decoder IC consists of a stereo decoder and postamplifier for the output. The right and left channel signals decoded by the stereo decoder H114, appear at pin ⑩ (right channel) and pin ⑪ (left channel), respectively. These signals are passed through the low-pass filters and de-emphasis networks to eliminate undesirable residual switching signals and are then delivered to postamplifier input pin ⑤ (right channel) and pin ⑦ (left channel), respectively. The signals amplified in the postamplifiers to the required level (approximately 10dB) are delivered to pin ⑥ (right channel) and pin ⑧ (left channel), and are then passed through C169 and C168 to pin terminals J114 and J115, hence, through the SELECTOR switch to the audio amplifier section.

Pin ⑮ on the MPX IC H114 is connected through R163 to the collector of the autostereo switch transistor H112, which turns on or off according to the incoming FM signal strength, thereby automatically switching between the stereophonic and monaural operations. The H112 turns on or off in accordance with whether the FM signal strength is more or less than approximately $25\mu V$.

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 SIGNAL STRENGTH meter. If the SIGNAL STRENGTH meter deflects at several frequencies received, the tuner circuits preceding the discriminator circuit 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. When SIGNAL STRENGTH meter deflects but no sound is obtained, check audio circuits, using high sensitive oscilloscope.

3.3.2 Symptom: No Stereo Separation

Connect an 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 PHONO jacks are applied to the phono-amplifier mounted on P400. The amplified and RIAA equalized phono signals and signals from the tuner section, CD-4/AUX and TAPE MONITOR IN jacks are applied to the SELECTOR switch which, in turn, leads the selected signals to the TAPE MON. switch and TAPE MONITOR OUT jacks. Applied to the other section of the TAPE MON. switch are signals from the TAPE MONITOR IN jacks. The TAPE MON. switch selects the signals from the SELECTOR switch or those from the TAPE MONITOR IN jacks and the selected signals go to the DOLBY and MODE switches. Signals are then mode processed by the MODE switch and its associated circuit and applied to the tone control amplifier through the buffer amplifier and BALANCE and VOLUME controls. The bass and treble controlled signals from the tone control amplifier pass through the hi filter before they reach the main amplifier.

4.1 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, each pair of input signals right-front (RF) and right-rear (RR), and left-front (LF) and left-rear (LR) are mixed together. The resultant signals (RF + RR) and (LF + LR) are delivered to the pairs of RF and RR, and LF and LR channels, respectively.

In the DISCRETE position, each channel signal is separately routed to the corresponding channel.

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
Minimum (FCCW)	LF + RF	RF + LF
Center	LF	RF
Maximum (FCW)	LF - RF	RF - LF

When the DIMENSION control is set to the minimum position the LR and RR channel signals become monophonic, to the center are stereophonic, and to the maximum are out of phase, thus providing vanished sound image positioning.

In the SQ DECODER position, signal sources encoded by the CBS SQ system are ideally decoded into 4-channel signals. Required for this operation is incorporation of the SQ Adaptor, Model SQA-1, into the Model 4230.

4.2 Balance Control

Signals from the buffer amplifiers are fed into the balance control circuit, in which the signals are controlled by three balancers: 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 channel is driven.

The balance control circuit is provided with the REMOTE CONTROL switch which makes the Model RC-4 Remote Control Box operative when set to the "REMOTE" position. In the "REMOTE" position the BALANCE and VOLUME controls on the Model 4230 become ineffective since signals are led to the Model RC-4. Balance and volume can be adjusted by the Model RC-4. Balanced and volume controlled signals are led to the tone control amplifier.

5. DOLBY UNIT

The Dolby unit built in Model 4230, which is a switchable processor, is inserted in each of both FRONT R and L channels. The attached "DOLBY PROCESSING CHART" will facilitate you to well understand the operation of the Dolby circuit.

An input signal coming to J601 is amplified by H601, and its output signal is led to the filter which cuts off the tape bias. The signal passed through the filter is further amplified and comes to the mixing circuit of resistors R623 and R625 and to the phase inverting circuit of H607 and H609. The output signal is fed out from J607.

In the recording mode of operation, the signal is fed out from J605 preceding the mixing circuit and applied at J611. The signal is then discriminated in the frequency and level by the dynamic filter consisting of H611, H613, H615 and H617, and is fed back to the mixing circuit.

In the playback mode of operation, a part of the output signal (at J607) is fed to J611 and discriminated in the frequency and level by the dynamic filter consisting of H611, H613, H615 and H617 and fed back to the mixing circuit.

6. 400Hz TONE

The 400Hz tone signal which is a 580mV, 400Hz sine wave is available at the FRONT and REAR TAPE MONITOR OUT terminals at any position of the DOLBY switch (with the exception of the RECORD II position) and the SELECTOR switch.

The output signal of the 400Hz oscillator consisting of HL01 and HL02 is fed to JL02 and JL03 through the emitter follower HL03. The output levels at JL02 and JL03 are adjusted to 580mV and approximately 25mV, respectively.

The signal fed from the Dolby P.W. Board (P600) comes to JL04 and is rectified through HL06. The rectified output at JL06 is led to the meter M004.

7. DOLBY SWITCH

This switch sets the Dolby noise-reduction circuit for record or playback and also switches the Meter Mode from AM or FM SIGNAL STRENGTH to DOLBY CAL LEVEL, or vice-versa.

With the DOLBY Switch placed in "OFF" position, the Meter will be used as a SIGNAL-STRENGTH meter; in all other positions as a DOLBY CAL LEVEL meter.

7.1 Dolby FM

This position is used for listening to Dolbyized FM broadcasts. The Dolby FM level has been pre-adjusted at the factory.

7.2 Play

This position is used to play back a Dolbyized source (except FM).

7.3 Off

With this position, the Dolby circuit is by-passed and the input signals are directly applied to both TAPE MONITOR OUT jacks and amplifiers.

7.4 Record I

For making a Dolbyized recording from an in-coming "flat" (non-Dolbyized) signal. When the MONITOR switch is in the SOURCE (out) position, the "flat" signal will be heard. When the MONITOR switch is in the TAPE (in) position, the Dolbyized signal from the tape will be heard.

7.5 Record II

For making a "flat" (non-Dolbyized) recording from an in-coming Dolbyized signal. Regardless of the position of the MONITOR switch, a "flat" signal will be heard.

8. RECORD LEVEL (L) (R)

These knobs control the record level of the signals to be recorded through the Dolby unit. Adjust the knobs so that the Level Meter pointers of the tape recorder do not exceed the 0VU level.

9. PLAY CAL. (L) (R)

These knobs adjust the playback outputs from a tape deck to the proper Dolby level.

10. DOLBY FM PRESET LEVEL CONTROLS

These factory-adjusted controls govern FM output level to the Dolby circuit. These controls are for the use of a qualified technician only.

11. 400Hz TONE SWITCH

This is used for calibration of the record input level of the tape deck. When the switch is depressed, the built-in oscillator operates and a sine wave signal output of 580mV will be applied to the four TAPE MONITOR OUT jacks.

12. FM DE-EMPHASIS SWITCH

At present both normal and Dolbyized FM broadcast programs are being transmitted with pre-emphasis time constant of 75 microsecond.

However if the Dolbyized FM broadcasting is approved by F.C.C., this pre-emphasis time constant for Dolbyized FM broadcast will be changed to 25 microsecond. The FM DE-EMPHASIS switch provided on the rear of Model 4230 is used for switching the time constants. After the permission of Dolbyized FM broadcasting, set the switch to 25 μ S position. This automatically change the time constant to 75 μ S while the DOLBY switch is placed in other than DOLBY FM positions (namely normal FM broadcast position), thus, the de-emphasis time constant for each normal and Dolbyized FM reception will be correctly set.

13. MAIN AMPLIFIER

Transistor H702 is the pre-driver coupled to the transistor H704 through capacitor C712. The transistor H704 drives the inverter transistors H710 and H712 which, in turn, drive the power stage consisting of H001 and H003. Transistors H706 and H708 are current limiter operating as a power transistor protection circuit.

Excessive current flow in the power output stage is detected by the resistors R759 and R761 and the resultant variation is applied to the transistors H706 and H708 and make them turned on. This decreases the base biasing current for H710 and H712. In this way the current flow in the power output stage (H001 and H003) is restricted within a safe predetermined value.

14. 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 12Wx4 position, this unit operates as a 12W 4 channel amplifier. With the switch placed in the 35Wx2 position, the unit operate as a 35W 2 channel amplifier, in this case, the power output is obtained only from FRONT SPK terminals.

The transistor H701 convert the phase of 1 channel amplifier and 3 channel amplifier.

15. POWER SUPPLY UNIT

The power supply unit consisting of transistors H801, H802 and H803, which operates as an automatic voltage regulator provides +35V DC to all of the amplifiers except main amplifiers and +14V DC to the tuner section.

16. AUDIO TROUBLE ANALYSIS

1. Excessive line consumption
 - a. Check for shorted rectifiers H007.
 - b. Check for shorted transistors H001 through H004. Check L001 for short.
2. No line consumption or zero bias.
 - a. Check line cord, fuse, shorted H005 and H006, H718 & H719.
 - b. Check for open rectifiers H007, or open L001.
3. Excessive hum and noise level
 - a. Check filter capacitors C003, C707, & C708.
 - b. Check for shorted transistor H801 and H802.
4. Parastic oscillation
 - a. Check for defective capacitors, C710, C711, C714, C715, C728 & C729.
5. Improper clipping
 - a. Check for proper adjustment of R727 & R728.

17. TEST EQUIPMENT REQUIRED FOR SERVICING

Table 1 lists the test equipment required for servicing the Model 4230 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.

Table 1. Test Equipment Required for Servicing

18. AM ALIGNMENT PROCEDURE

18.1 AM IF Alignment

1. Connect a sweep generator to J107 and an alignment scope to the test point (B).
2. Rotate each core of IF transformer L116 and L117 for maximum height and flat top symmetrical response.

18.2 AM Frequency Range and Tracking Alignment

1. Set AM signal generator to 525KHz. Turn the tuning capacitor fully closed (place the tuning pointer at the low end.) and adjust the oscillator coil L115 for maximum audio output.

2. Set the signal generator to 1650KHz. Place the tuning pointer in the high frequency end and adjust the oscillator trimmer on the oscillator tuning capacitor (CA-2) for maximum audio output.
 3. Repeat the step 1 and 2 until no further adjustment is necessary.
 4. Set the generator to 600KHz 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 1400KHz and tune the receiver to the same frequency and adjust the trimming capacitors of antenna (CA-1) for maximum output.
 6. Repeat the step 4 and 5 until no further adjustment is necessary.
- Note: During tracking alignment reduce the signal generator output as necessary to avoid AGC action.

19. FM ALIGNMENT PROCEDURE

1. Connect an FM signal generator to the FM ANTENNA terminals and a oscilloscope and an audio distortion analyzer to the TAPE MONITOR OUT jacks on the rear panel.
2. Set the FM SG to 87.5MHz and provide about 3 to 5 μ V. Place the tuning pointer at the low frequency end by rotating the tuning knob and adjust the core of oscillator coil L103 to obtain maximum audio output.
3. Set the FM SG to 108.5MHz and provide about 3 to 5 μ V output. Rotate the tuning knob and place the tuning pointer at the high frequency end and adjust the trimming capacitor C187 for maximum output.
4. Repeat the step 2 and 3 until no further adjustment is necessary.
5. Set the FM SG to 90MHz 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 antenna coil L101, RF coil L102 and IF transformer L105 for minimum audio distortion.
6. Set the FM SG to 106MHz and tune the receiver to the same frequency. Adjust the trimming capacitor CF-1, CF-2 for minimum distortion.
7. Repeat the step 5 and 6 until no further adjustment is necessary.
8. Connect a DC VTVM with 1 volt range selected to the test point \textcircled{E} (J120) and adjust the secondary core (upper) of discriminator transformer L107 so that no voltage reading is obtained on the VTVM at no signal.
Next set the FM SG to 98MHz and increase the output level to 1K μ V, then tune the receiver to the same frequency so that no deflection is obtained on the VTVM.
Adjust primary core (bottom) of L107 for minimum distortion, and adjust the L108 for the maximum deflection of FM SIGNAL STRENGTH meter M004.

19.1 Stereo Separation Alignment

1. Set the FM SG to provide 1K μ V at 98MHz.
Tune the receiver to the same frequency perfectly (so that the VTVM connected to the test point \textcircled{E} gives no reading).
2. Modulate the FM SG with stereo composite signal consisting of subchannel signal only (of course a pilot signal must be included).
Adjust the core of L110 for maximum audio output, then, modulate the FM SG with a stereo composite signal consisting of L or R channel only, and adjust the trimming resistor R 161 for maximum and equal separation in both channels.

19.2 Muting Circuit Alignment

1. Set the FM SG output to provide 25 μ V (IHF) at 98MHz and tune the receiver to the same frequency.
Adjust the trimming resistor R153 for the threshold level of 25 μ V (during this adjustment turn the FM MUTING pushswitch "on").

20. AUDIO ADJUSTMENT

1. Connect a VTVM to J717 (+) and J711 (-) and adjust the trimming resistor R737 until the VTVM reads 15mV DC. For the other channel connect the VTVM to J718 (+) and J712 (-) and adjust the R738 for the same reading.
2. Connect an oscilloscope across the SPEAKER terminals. Apply an audio signal of 1KHz to the CD-4/AUX jacks and increase the audio signal until the audio output on the scope begins to start clipping. Adjust the trimming resistor R727 for equal and symmetrical clipping. For the other channel adjust the R728.

21. AUTOMATIC VOLTAGE REGULATOR ADJUSTMENT

Connect a VTVM to J801 (+) and J811 (-) and adjust R801 until the VTVM reads 35.0V under no signal condition.

22. DOLBY ALIGNMENT PROCEDURE

Prior to the adjustment, turn the PLAY CAL and REC LEVEL controls all the way to the right and the SELECTOR switch to the CD-4/AUX position. Use the CD-4/AUX and TAPE MONITOR OUT jacks for the signal input and output.

1.
 - 1) Set the DOLBY switch to the RECORD I position.
 - 2) Adjust the semi-fixed resistor R653 for maximum source voltage of the field-effect transistor H611.
 - 3) Connect J620 and J613 to the ground.
 - 4) Apply a 5KHz sine wave so as to obtain 17.5mV at J605.
 - 5) Record the output level at the TAPE MONITOR OUT jack with the above signal applied.
 - 6) Adjust the semi-fixed resistor R659 so that the output level at the TAPE MONITOR OUT jack may increase 10 ± 0.25 dB when J620 is disconnected from the ground.
 - 7) Record the above output level.
 - 8) Adjust the semi-fixed resistor R653 so that the output level may decrease 2 ± 0.25 dB when J613 is disconnected from the ground.
 - 9) Connect J613 to the ground again, and assure the level increase in the step (6) above. Disconnect J613.
2.
 - 1) Set the DOLBY switch to the RECORD II position.
 - 2) Connect J620 and J613 to the ground.
 - 3) Apply a 5KHz sine wave so as to obtain a 44mV at J605.
 - 4) Check to insure that the level at the TAPE MONITOR OUT jack decreases 10 ± 0.5 dB when J620 is disconnected from the ground.
 - 5) Disconnect J620 and J613 from the ground.
 - 6) Check to insure that the output voltage at the TAPE MONITOR OUT jack is 17.5mV (± 0.5 dB).
3. For the level adjustment, set the DOLBY switch and SELECTOR switch to the RECORD I and CD-4/AUX positions, respectively, and use the TAPE MONITOR OUT jack for the signal output. By setting the 400Hz TONE pushswitch "in", the 400Hz sine wave is fed out. Adjust the semi-fixed resistor RL11 for 580mV of the sine wave output voltage in both R and L channels. Then, set the DOLBY switch to the RECORD II position, and apply the 400Hz signal for 580mV of the output voltage. Adjust the semi-fixed resistors RL28 and RL29 so that the DOLBY LEVEL meter may point the Dolby level. Change over the METER switch, and perform this adjustment for both R and L channels.

Next, adjust the semi-fixed resistor RL12 for 580mV output level when the DOLBY switch is set to the OFF position. Check the 400Hz output signal level after the adjustment of the level setting semi-fixed resistors RL11 and RL12. The output level must be precisely 580mV since it is a reference level of the Dolby circuit.

23. ALIGNMENT PROCEDURES OF DOLBY FM PRESET LEVEL CONTROLS

Connect an FM signal generator to the FM antenna. Set the signal generator for 400Hz 50% modulation.

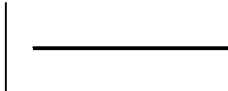
Set the FM signal generator to 98MHz and the DOLBY switch to the OFF position. Turn the Tuning knob on Model 4230 until it tunes to the 98MHz signal from the FM signal generator.

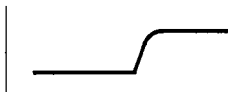
Then, set the DOLBY switch to the DOLBY FM position, and adjust the FM preset level controls RC05 and RC06 so that the DOLBY LEVEL meter may point the Dolby level. Change over the METER switch, and perform this adjustment for both R and L channels.

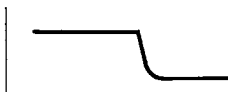
24. EXPLANATION OF THE DOLBY PROCESSING CHART

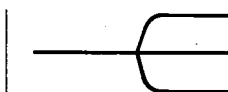
This chart shows the condition of the signals available at the speakers (SPKRS) and at the TAPE MONITOR OUT terminals as a function of different control settings.

To understand the chart refer to the symbols below:

- 

— Represents a signal which has not been applied to either Record or Playback Dolby circuits. The relative amplitudes of all audio frequencies remain unaltered at all levels.
- 

— Represents a signal which has been processed by the Dolby Record circuit. The relative amplitude of the high frequencies is increased at low signal levels.
- 

— Represents a signal which has been processed by the Dolby Playback circuit. The relative amplitude of the high frequencies is decreased at low signal levels.
- 

— Represents a signal which has been processed by both the Record and the Playback Dolby circuits.

These circuits are complementary. Therefore, relative amplitudes of all audio frequencies are restored to their original values.

SIGNAL	DOLBY SW	DOLBY FM						PLAY						OFF						RECORD						
		TAP MON		SIGNAL AT		SOURCE		TAPE		SOURCE		TAPE		SOURCE		TAPE		SOURCE		TAPE		SOURCE		TAPE		
		SPKRS	TAPE OUT	SPKRS	TAPE OUT	SPKRS	TAPE OUT	SPKRS	TAPE OUT	SPKRS	TAPE OUT	SPKRS	TAPE OUT	SPKRS	TAPE OUT	SPKRS	TAPE OUT	SPKRS	TAPE OUT	SPKRS	TAPE OUT	SPKRS	TAPE OUT	SPKRS	TAPE OUT	
NORMAL FM																										
75 μS FM WITH DOLBY																										
DOLBY FM (25 μS W/DOLBY)																										
OTHER SOURCE																										

NOTE: * DE-EMPHASIS SWITCH IN THE 75 μS POSITION.
 ** DE-EMPHASIS SWITCH IN THE 25 μS POSITION.

Table 2. Dolby Processing Chart

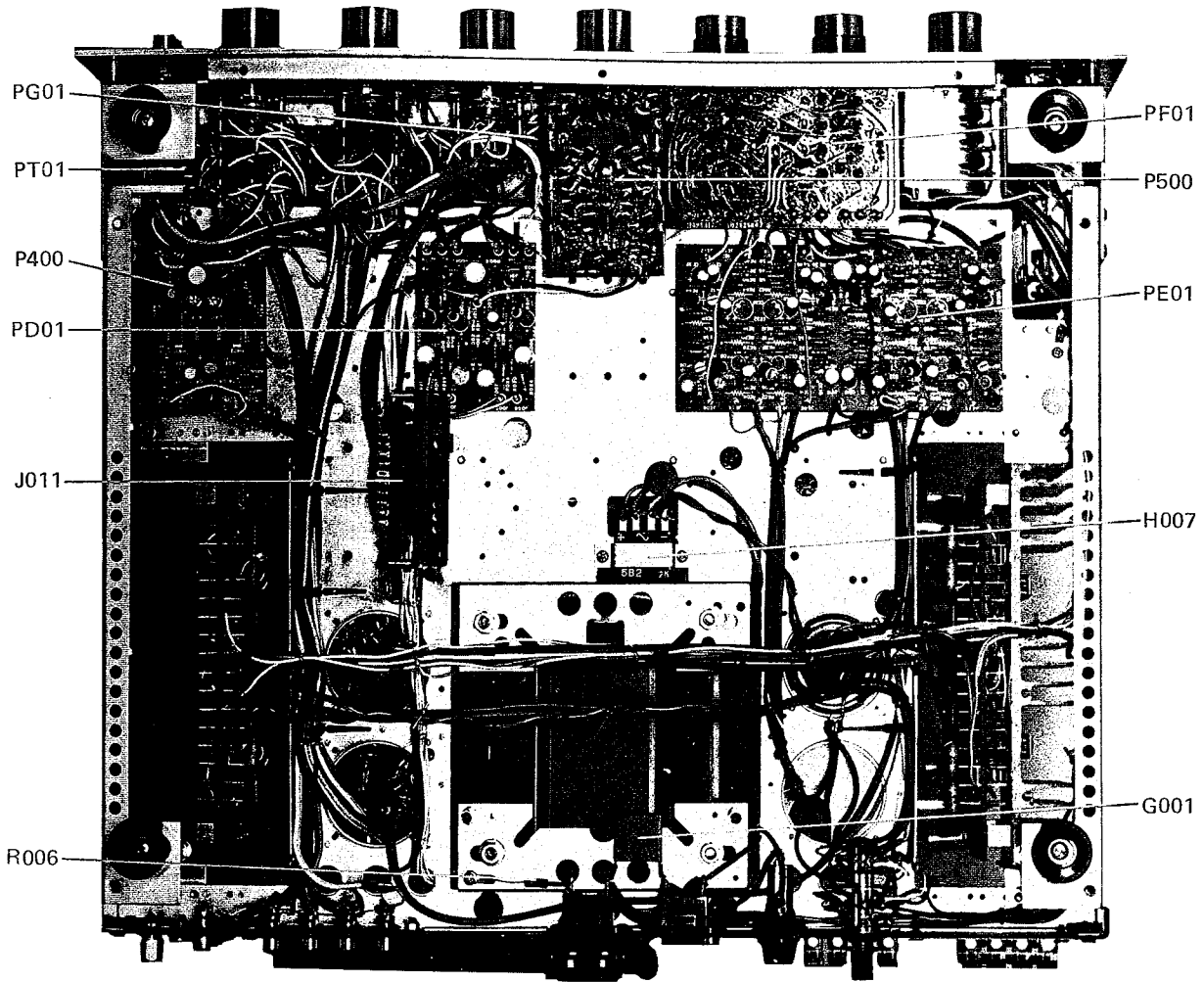


Figure 1. Main Chassis Component Locations (Bottom View)

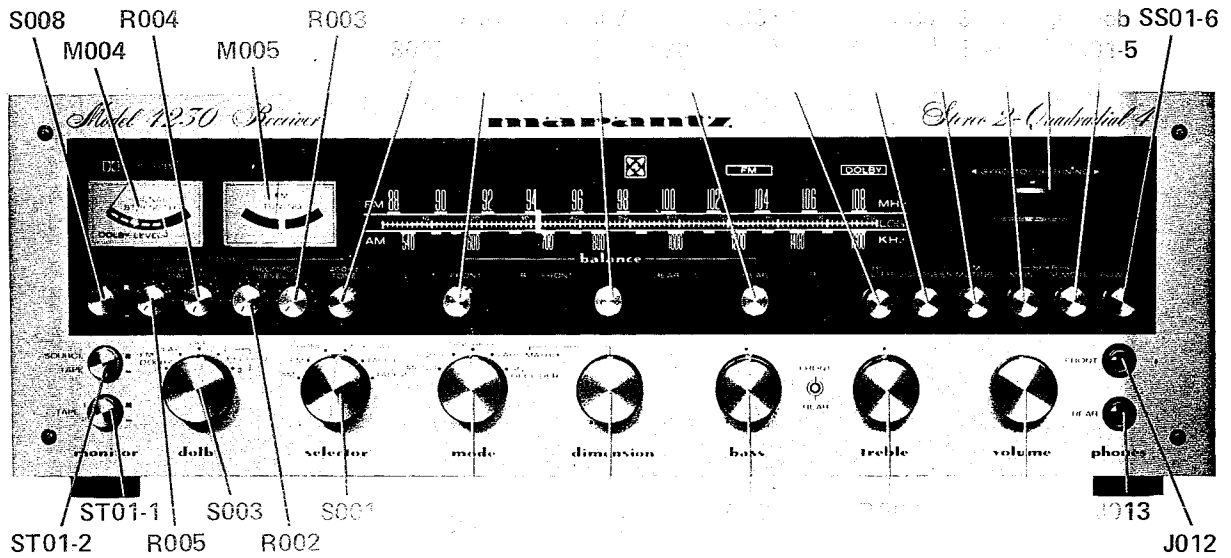


Figure 2. Front Panel Adjustment and Component Locations

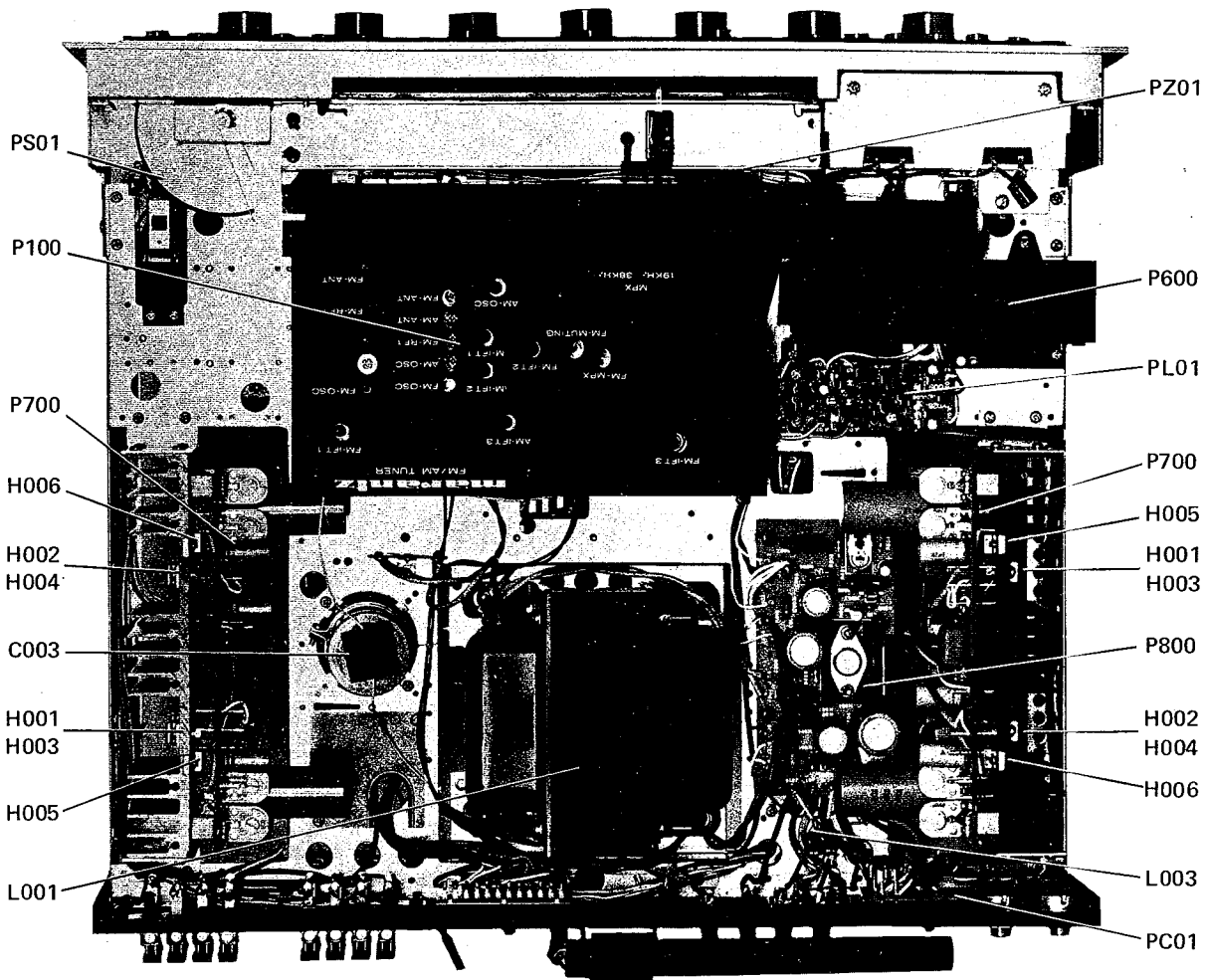


Figure 3. Main Chassis Component Locations (Top View)

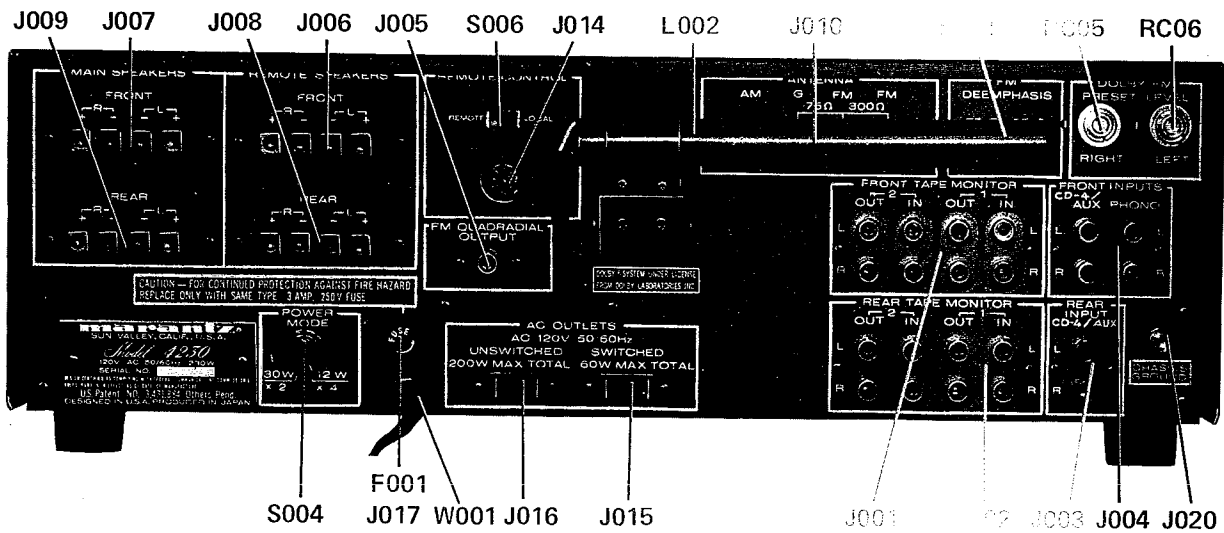


Figure 4. Rear Panel Adjustment and Component Locations

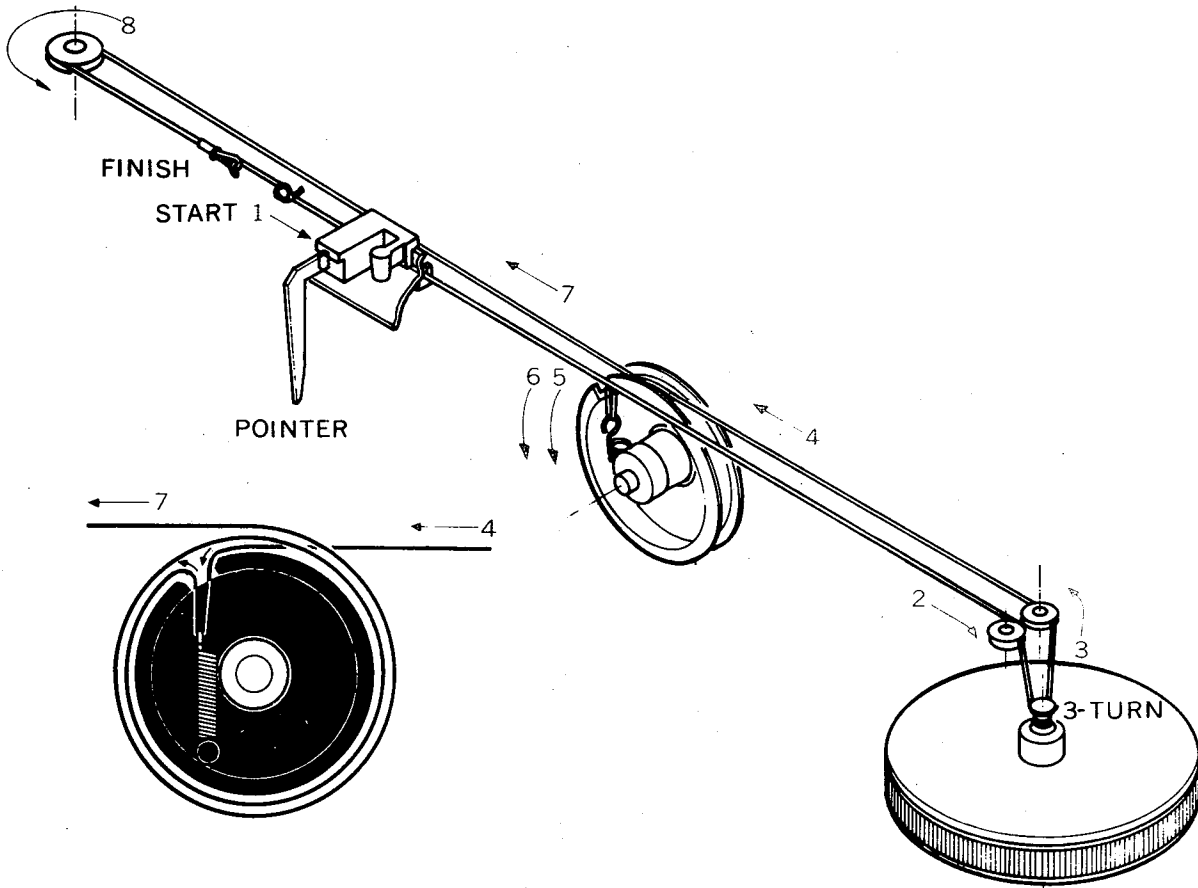


Figure 5. Dial Stringing

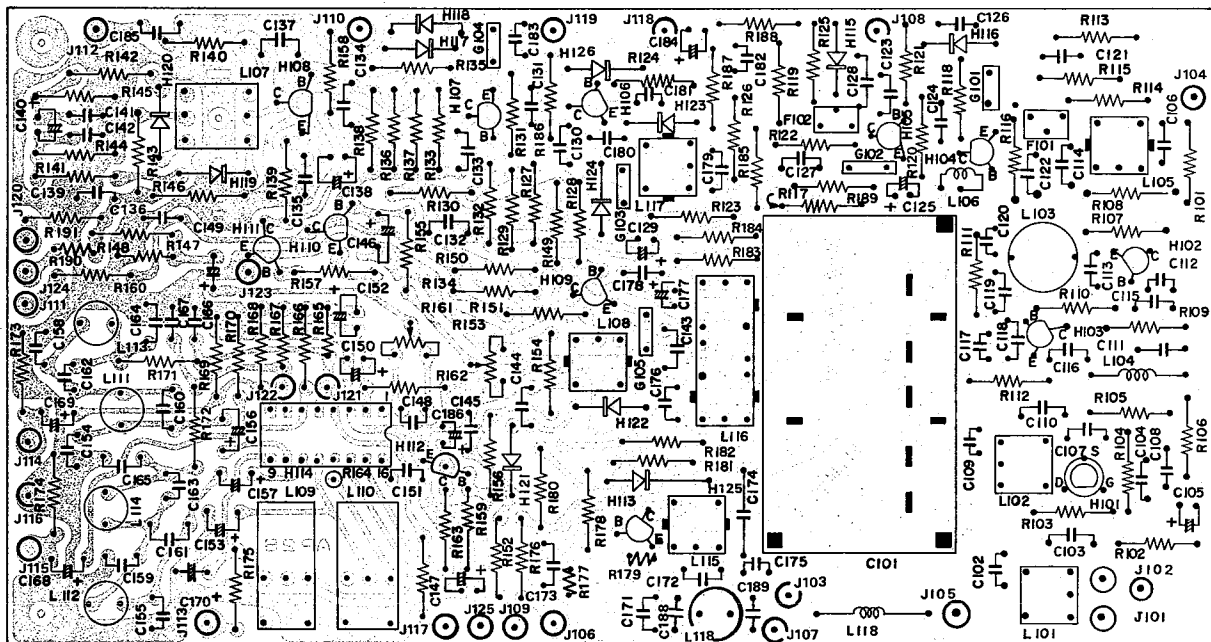


Figure 6. FM and AM Tuner Assembly P100 Component Locations

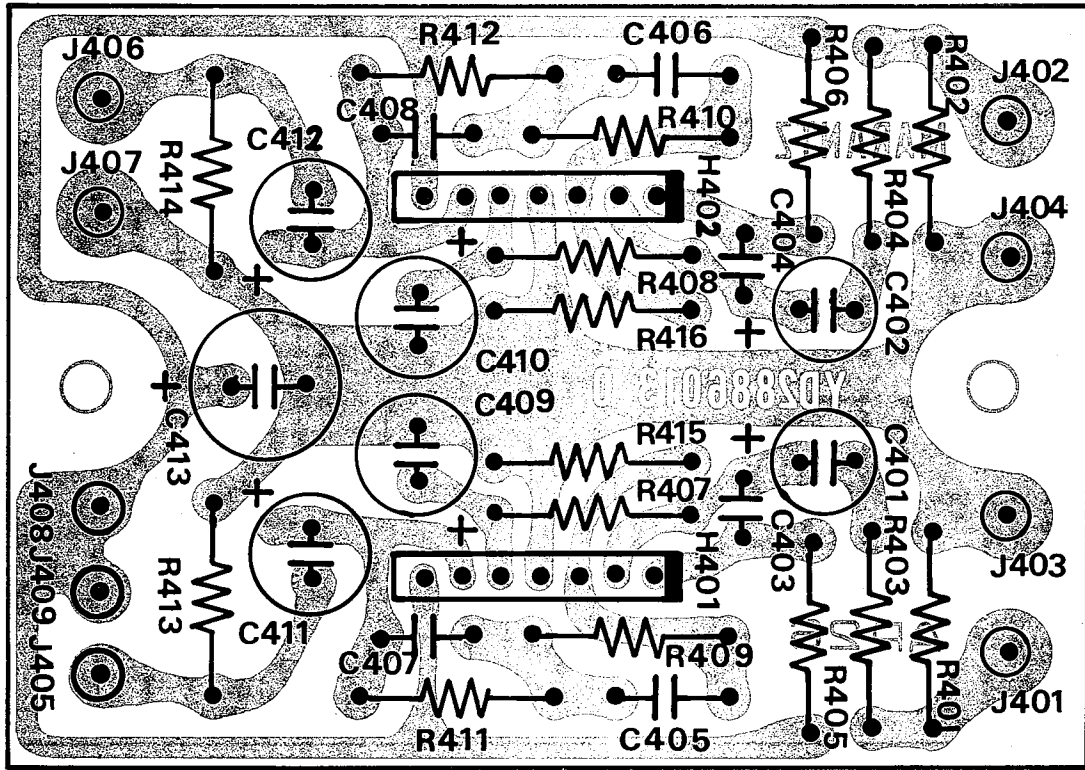


Figure 7. Phono Amplifier Assembly P400 Component Locations

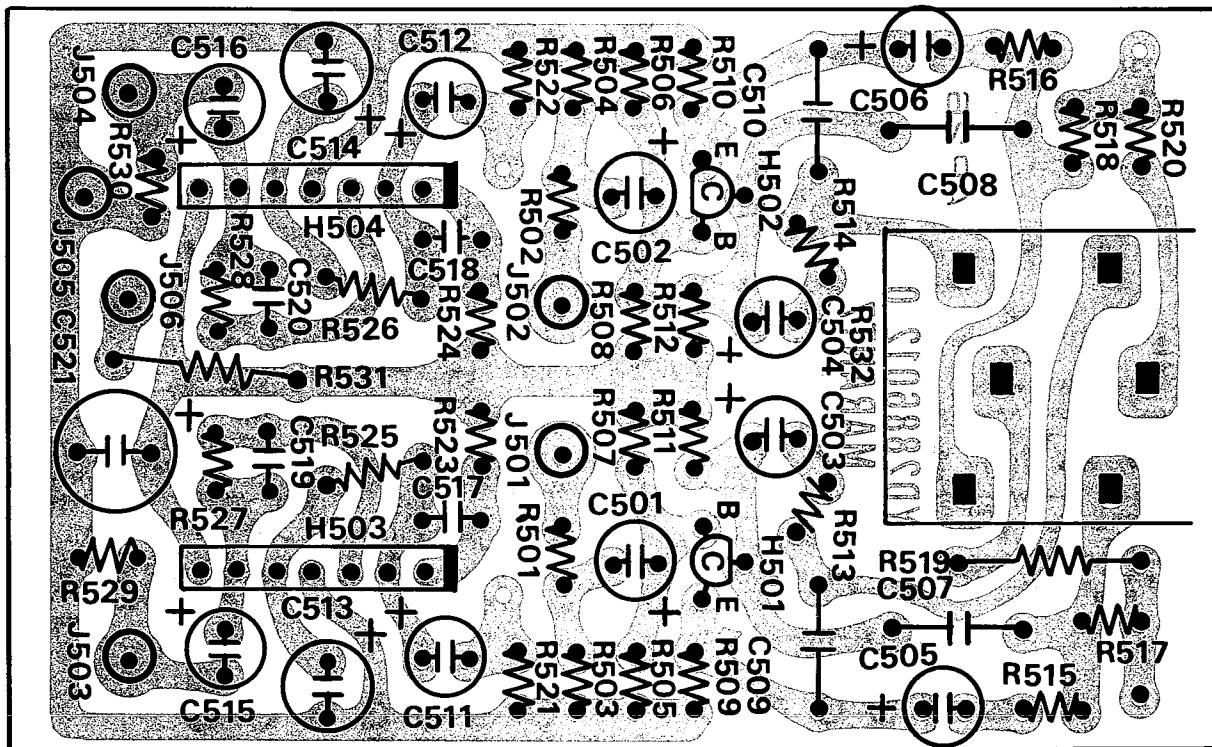


Figure 8. Vari-Matrix Unit Assembly P500 Component Locations

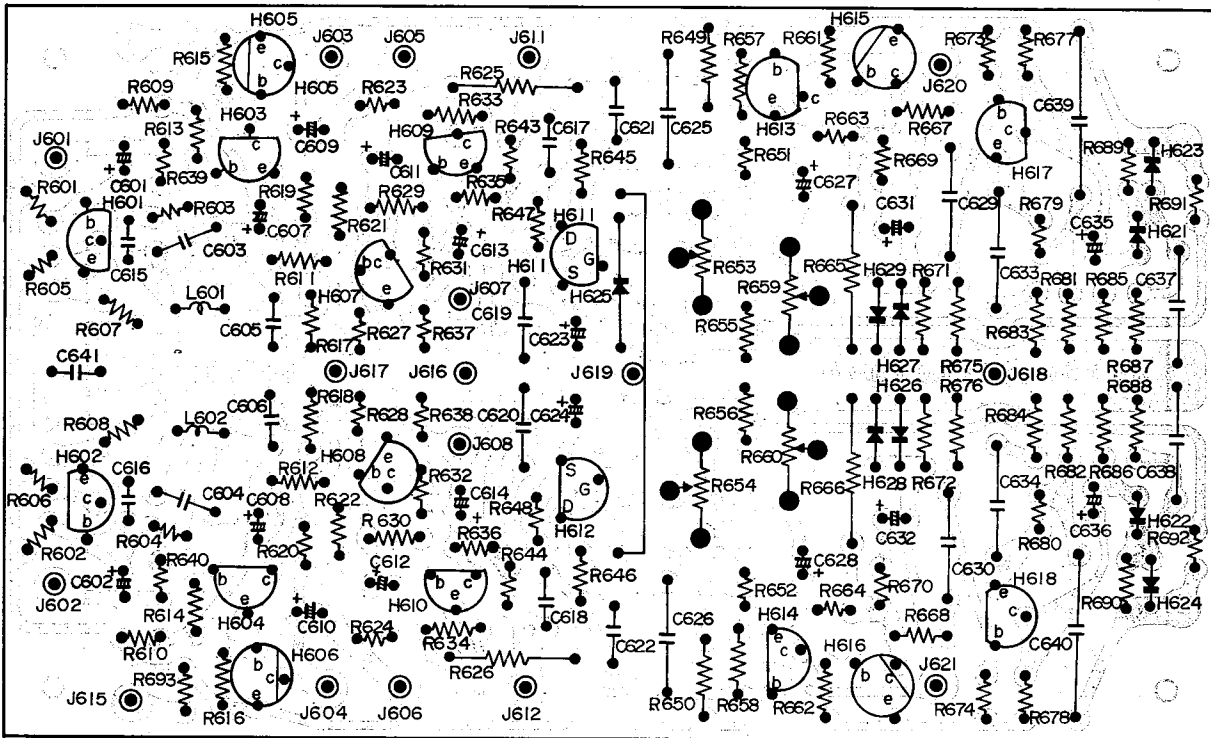


Figure 9. Dolby Unit Assembly P600 Component Locations

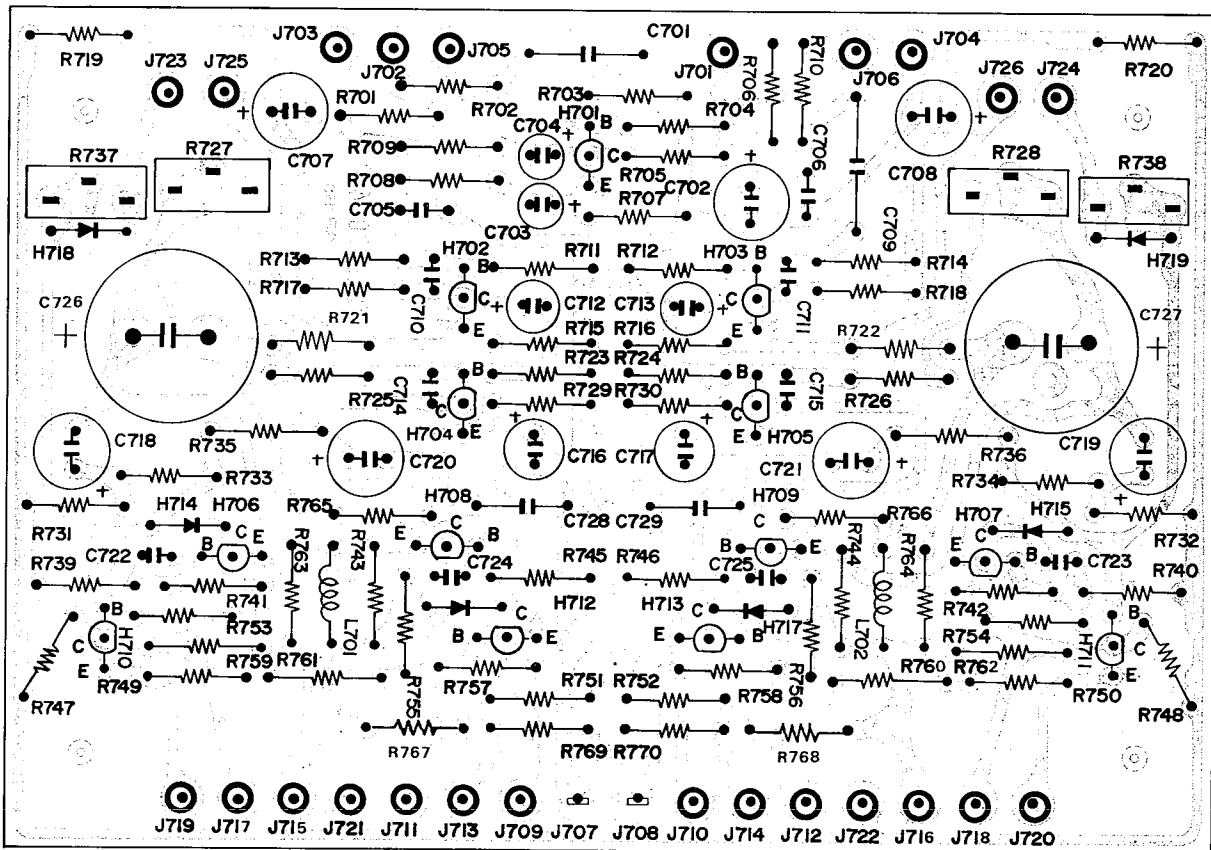


Figure 10. Power Amplifier Assembly P700 Component Locations

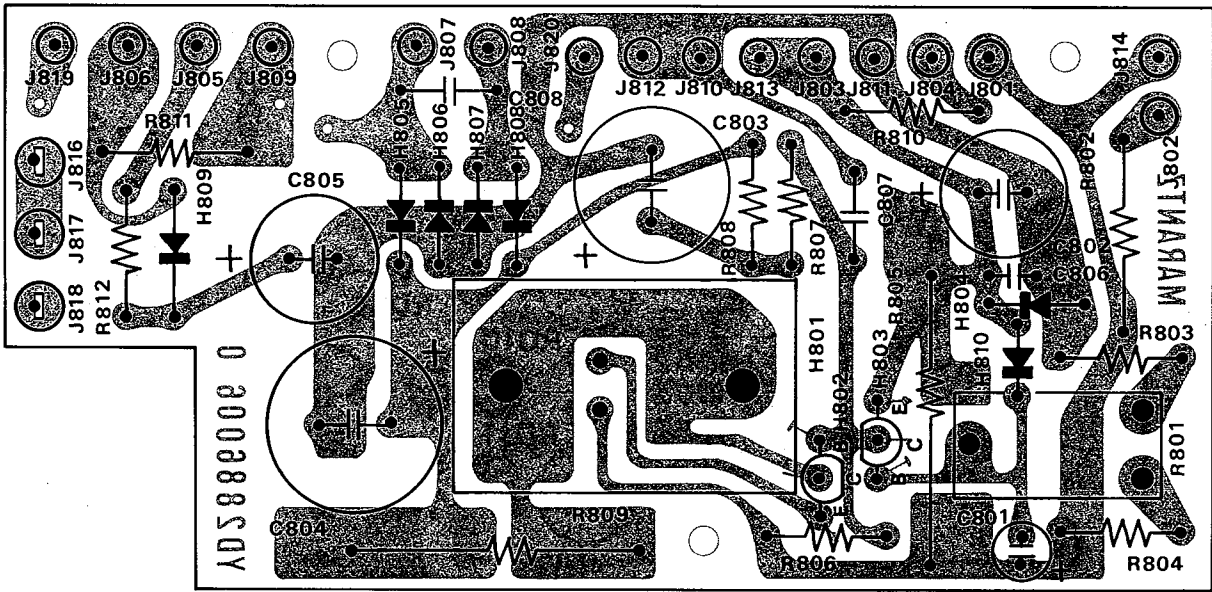


Figure 11. Power Supply Assembly P800 Component Locations

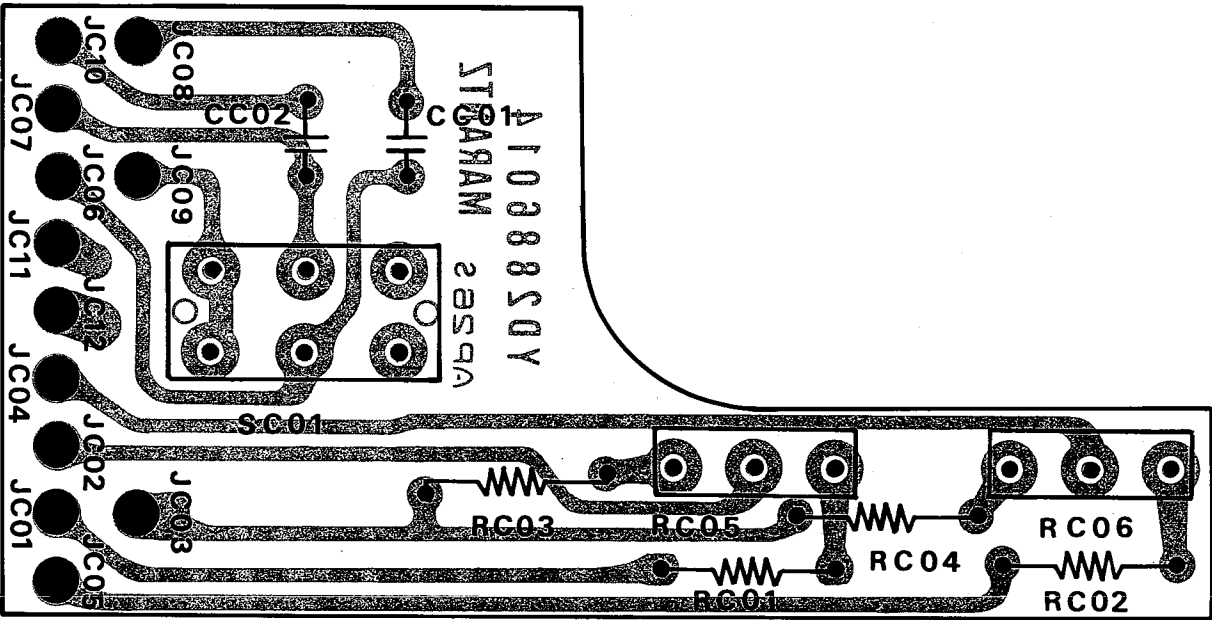


Figure 12. FM De-emphasis Switch Unit Assembly PC01 Component Locations

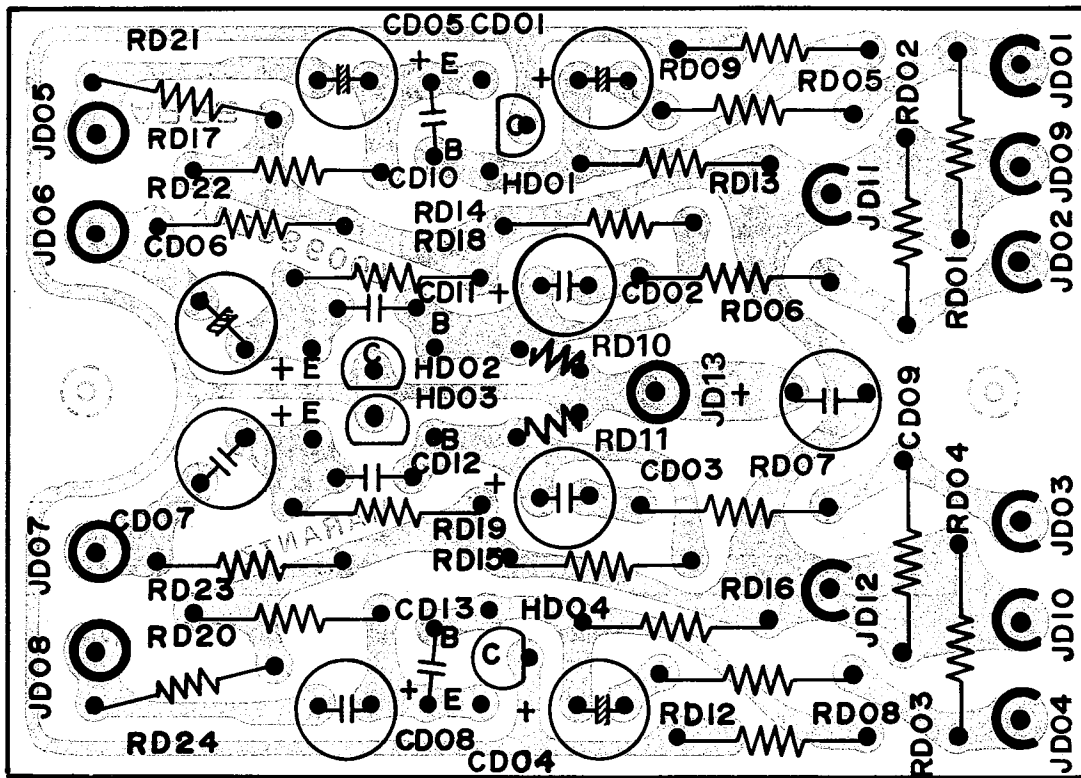


Figure 13. Buffer Amplifier Assembly PD01 Component Locations

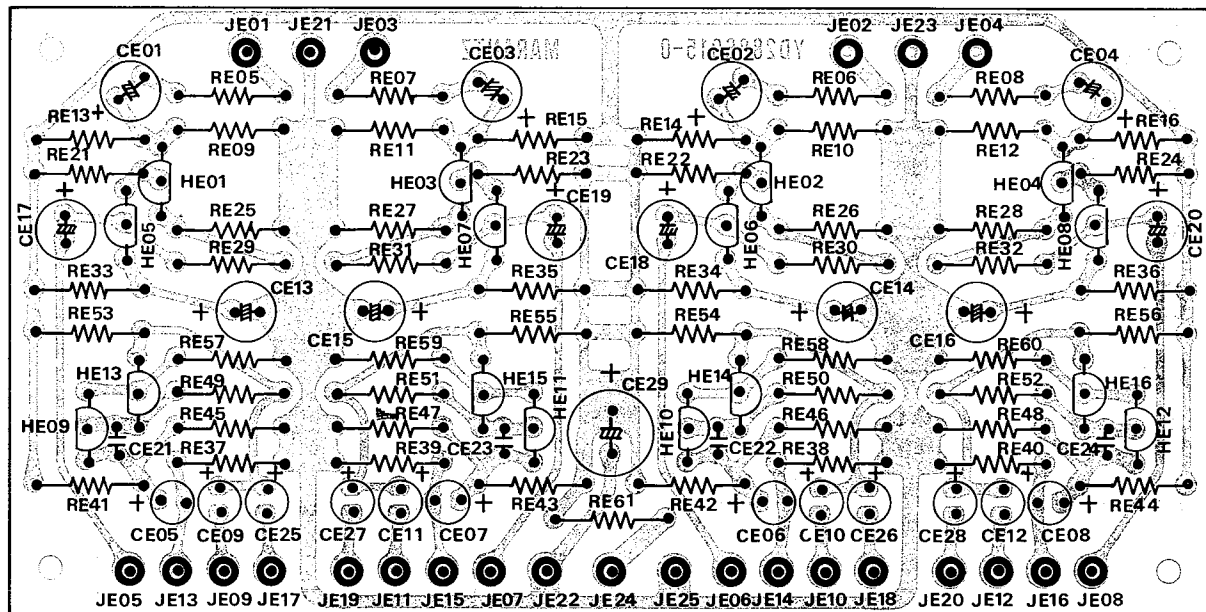


Figure 14. Tone Amplifier Assembly PE01 Component Locations

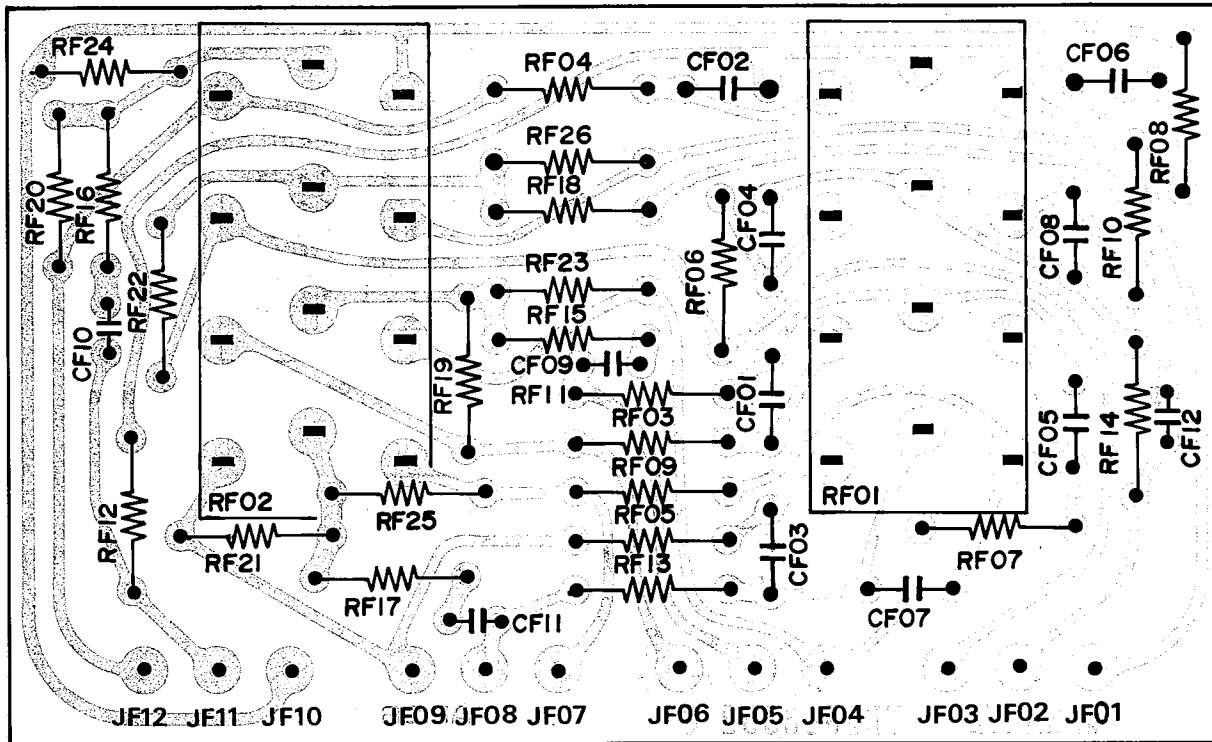


Figure 15. Tone Control Unit Assembly PF01 Component Locations

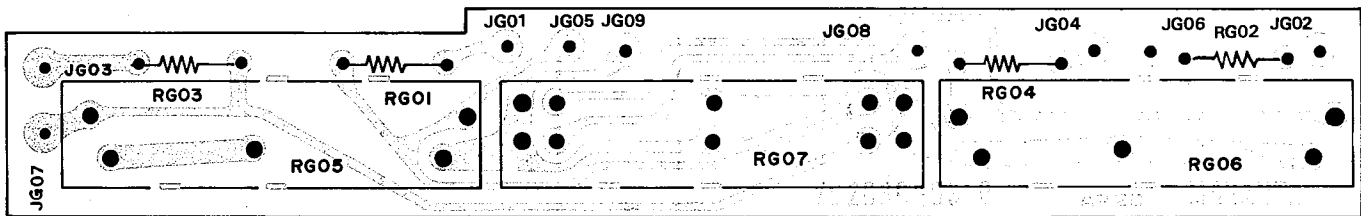


Figure 16. Balance Control Unit Assembly PG01 Component Locations

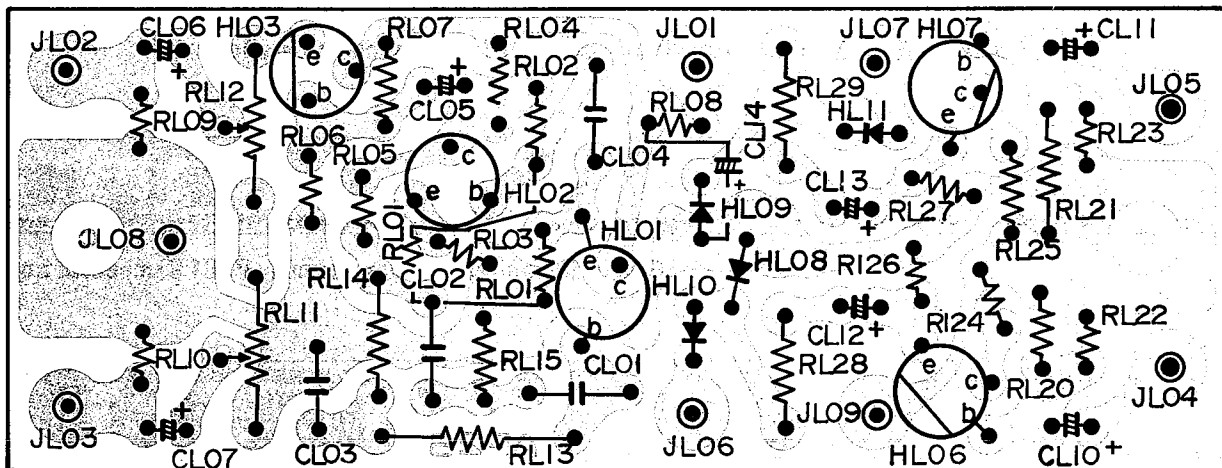


Figure 17. 400Hz Oscillator and Meter Driver Assembly PL01 Component Locations

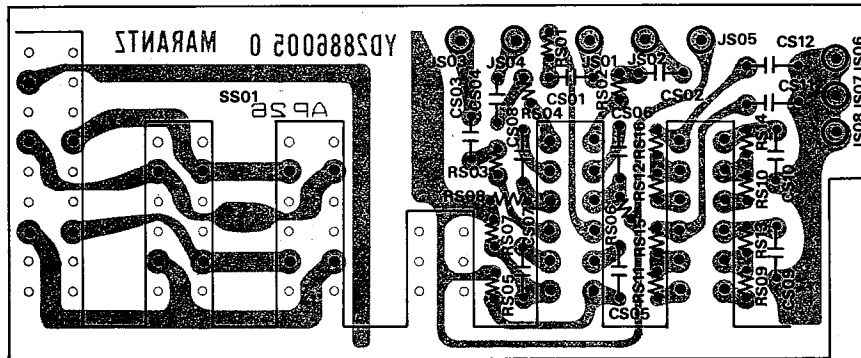


Figure 18. Loudness, Hi Filter, Speaker and Power Switch Unit Assembly PS01 Component Locations

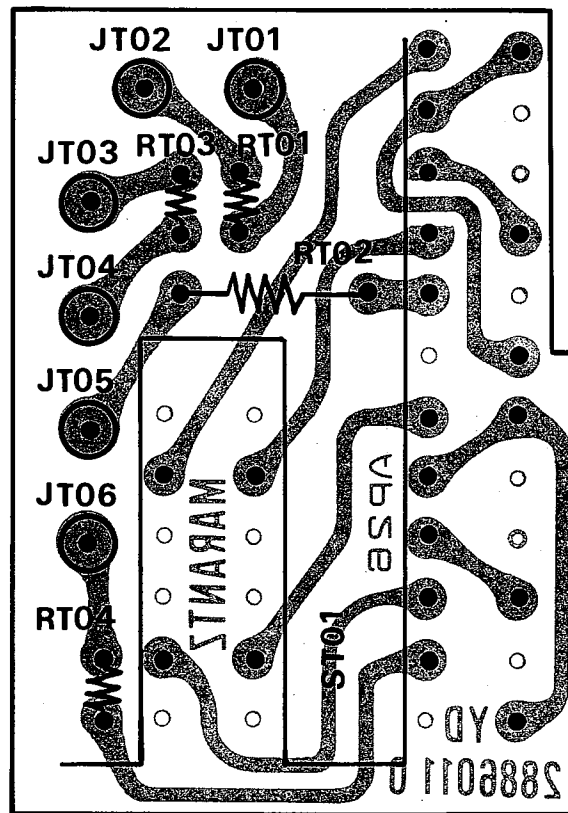


Figure 19. Tape Monitor Switch Unit Assembly PT01 Component Locations



Figure 20. Indicator Lamps Assembly PY01 Component Locations

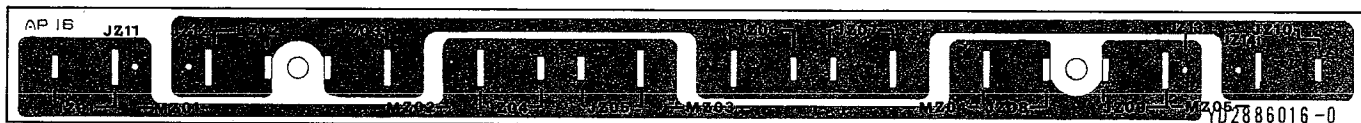


Figure 21. Dial Lamps Assembly PZ01 Component Locations

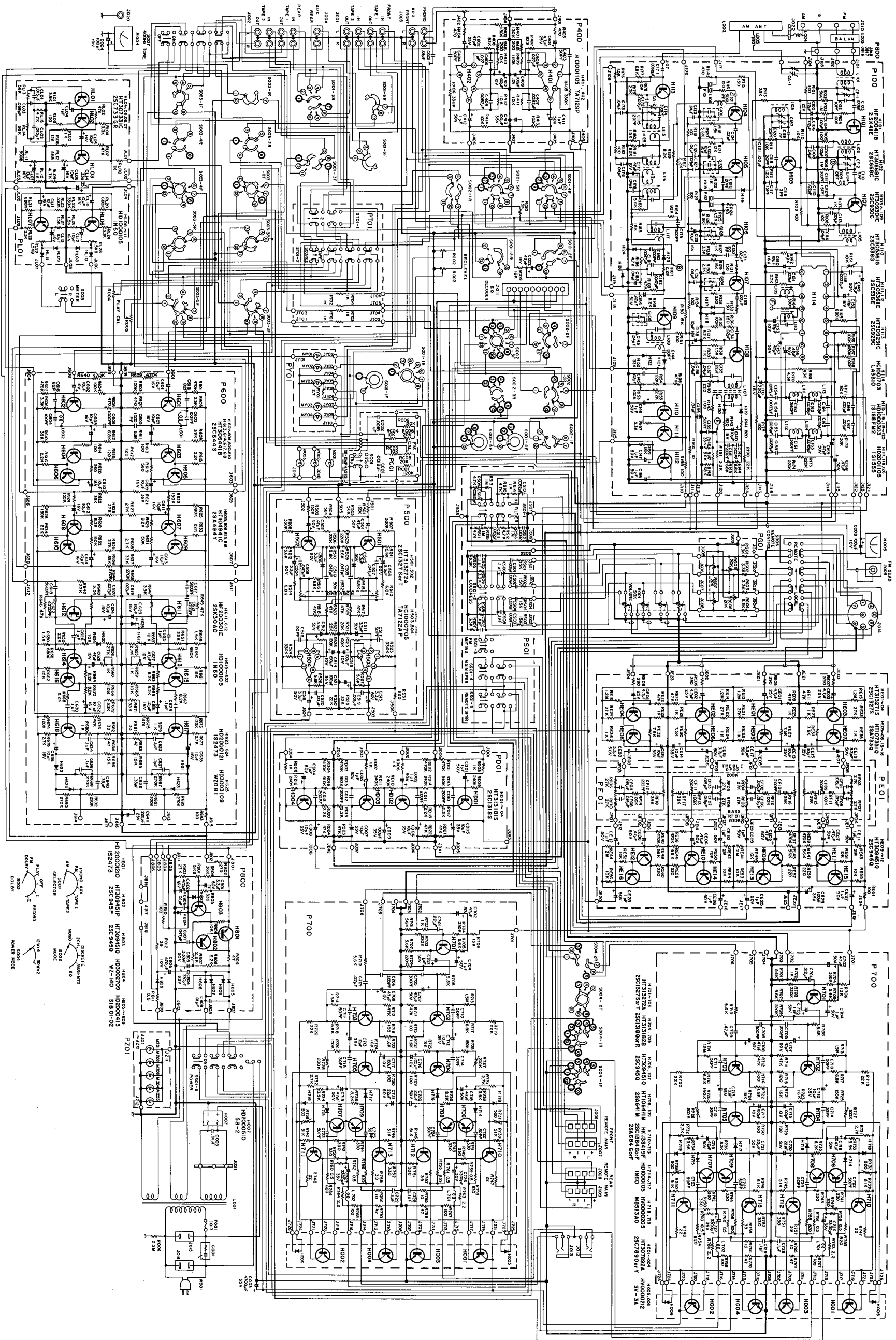


Figure 22. Schematic Diagram

PARTS LIST

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
A	288606340	Front Panel Assembly for U.S.A.	P100	YD2886001	P.W. Board
0103	288606301	Escutcheon		ZZ2886001	P.W. Board Ass'y
0104	285340101	Frame			RESISTORS
0105	288615801	Window			All resistors are $\pm 5\%$ and $\frac{1}{4}W$, otherwise indicated.
0106	288625901	Bush x 10	R101	RT0510114	100 Ω
0107	273125901	Bush x 2	R102	RT0556314	56K Ω
0109	288605302	Cover	R103	RT0510514	1M Ω
0110	289010701	Sheet	R104	RT0510414	100K Ω
0111	285025901	Bush x 3	R105	RT0510114	100 Ω
A1	288606341	Front Panel Assembly for CANADA	R106	RT0510514	1M Ω
0103	288606301	Escutcheon	R107	RT0510214	1K Ω
0104	285340101	Frame	R108	RT0510114	100 Ω
0105	288615801	Window	R109	RT0510114	100 Ω
0106	288625901	Bush x 10	R110	RT0510314	10K Ω
0107	273125901	Bush x 2			
0110	289010701	Sheet	R111	RT0510314	10K Ω
0111	285025901	Bush x 3	R112	RT0512214	1.2K Ω
B	285325743	Lid Assembly	R113	RT0533314	33K Ω
0207	285325750	Lid K	R114	RT0547114	470 Ω
0211	288812001	Insulator	R115	RT0515114	150 Ω
0212	285612001	Insulator	R116	RT0515114	150 Ω
C	281815440	Knob Assembly	R117	RT0582214	8.2K Ω
0224	281815404	Knob	R118	RT0515214	1.5K Ω
0225	71400149Q	Spring	R119	RT0510114	100 Ω
D	281815441	Knob Assembly	R120	RT0556214	5.6K Ω
0228	281815405	Knob			
0229	71400159Q	Spring	R121	RT0512314	12K Ω
E	288616040	Rear Panel Assembly	R122	RT0510214	1K Ω
0503	288616001	Bracket	R123	RT0510114	100 Ω
0510	55060365S	T.R. Rivet x 4	R124	RT0515114	150 Ω
J015	YJ0400018	Jack	R125	RT0515214	1.5K Ω
J016	YJ0400018	Jack	R126	RT0533214	3.3K Ω
F	285327340	Fly Wheel Assembly	R127	RT0510214	1K Ω
0703	257706302	Escutcheon x 2	R128	RT0533214	3.3K Ω
0704	257727301	Fly Wheel	R129	RT0515314	15K Ω
0705	285311201	Shaft	R130	RT0527214	2.7K Ω
0708	53110603E	Hexagon Nut			
0710	54020601E	Flat Washer	R131	RT0515114	150 Ω
G	120200640	String Assembly	R132	RT0533114	330 Ω
0813	120225801	Hook	R133	RT0515114	150 Ω
0814	72080802A	String	R134	RT0510114	100 Ω
H	281810341	Pointer Assembly	R135	RT0510414	100K Ω
0823	281810301	Pointer	R136	RT0515114	150 Ω
0824	281810302	Pointer	R137	RT0582214	8.2K Ω
0825	281805301	Cover	R138	RT0515314	15K Ω
M001	IN1008030	Lamp	R139	RT0510214	1K Ω
I	281915941	Drum Assembly	R140	RT0522114	220 Ω
1922	281915901	Drum			
1923	71101569M	Spring	R141	RT0582114	820 Ω
1924	51064019A	Screw x 2	R142	RT0582114	820 Ω
			R143	RT0510114	100 Ω
			R144	RT0568214	6.8K Ω
			R145	RT0568214	6.8K Ω
			R146	RT0518314	18K Ω
			R147	RT0510314	10K Ω
			R148	RT0522314	22K Ω
			R149	RT0582214	8.2K Ω
			R150	RT0515314	15K Ω
			R151	RT0510114	100 Ω
			R152	RT0533314	33K Ω
			R153	RA0104015	Trimming, 100K Ω (B)
			R154	RT0522314	22K Ω
			R155	RT0522314	22K Ω
			R156	RT0547314	47K Ω
			R157	RT0533214	3.3K Ω
			R158	RT0510114	100 Ω

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R159	RT0518314	18K Ω
R160	RT0510014	10 Ω
R161	RA0103020	Trimming, \pm 10K Ω (B)
R162	RT0547214	4.7K Ω
R163	RT0518214	1.8K Ω
R164	RC1033412	330K Ω \pm 10%, $\frac{1}{2}$ W
R165	RT0568414	680K Ω
R166	RT0510414	100K Ω
R167	RT0568414	680K Ω
R168	RT0510414	100K Ω
R169	RT0543214	4.3K Ω
R170	RT0543214	4.3K Ω
R171	RT0530314	30K Ω
R172	RT0530314	30K Ω
R173	RT0522414	220K Ω
R174	RT0522414	220K Ω
R175	RT0510114	100 Ω
R176	RT0515214	1.5K Ω
R177	RT0568214	6.8K Ω
R178	RT0515314	15K Ω
R179	RT0527214	2.7K Ω
R180	RT0515214	1.5K Ω
R181	RT0582314	82K Ω
R182	RT0510114	100 Ω
R183	RT0556214	5.6K Ω
R184	RT0582314	82K Ω
R185	RT0515314	15K Ω
R186	RT0547214	4.7K Ω
R187	RT0522214	2.2K Ω
R188	RT0547214	4.7K Ω
R189	RT0522214	2.2K Ω
R190	RT0522314	22K Ω
R191	RT0533214	3.3K Ω
CAPACITORS		
C101	CA3240007	Variable, FM-3, AM-2, Gang
C102	DD1210001	Ceramic, 10PF \pm 10%
C103	DK1710201	Ceramic, 0.001 μ F \pm 20%
C104	DK1820302	Ceramic, 0.02 μ F +100%, -0%
C105	EM2240251	Electroly, 0.22 μ F, 25V
C106	DK1820302	Ceramic, 0.02 μ F +100%, -0%
C107	DK1820302	Ceramic, 0.02 μ F +100%, -0%
C108	DK1840302	Ceramic, 0.04 μ F +80%, -20%
C109	DD1210001	Ceramic, 10PF \pm 10%
C110	DD1105001	Ceramic, 5PF \pm 0.5PF
C111	DD1530101	Ceramic, 300PF \pm 5%
C112	DD1615003	Ceramic, 15PF \pm 10%
C113	DK1710201	Ceramic, 0.001 μ F \pm 20%
C114	DK1840302	Ceramic, 0.04 μ F +80%, -20%
C115	DK1820302	Ceramic, 0.02 μ F +100%, -0%
C116	DD1102004	Ceramic, 2PF \pm 0.5PF
C117	DD1615003	Ceramic, 15PF \pm 10%
C118	DD1520001	Ceramic, 20PF \pm 5%
C119	DD1207003	Ceramic, 7PF \pm 1PF
C120	DD1525002	Ceramic, 25PF \pm 5%
C121	DK1820302	Ceramic, 0.02 μ F +100%, -0%
C122	DD1650101	Ceramic, 500PF \pm 10%
C123	DK1840302	Ceramic, 0.04 μ F +80%, -20%
C124	DK1820302	Ceramic, 0.02 μ F +100%, -0%
C125	EA1060169	Electroly, 10 μ F, 16V
C126	DK1840302	Ceramic, 0.04 μ F +80%, -20%
C127	DK1840302	Ceramic, 0.04 μ F +80%, -20%
C128	DD1620001	Ceramic, 20PF \pm 10%

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
C129	EA1060169	Electroly, 10 μ F, 16V
C130	DD1610101	Ceramic, 100PF \pm 10%
C131	DK1820302	Ceramic, 0.02 μ F +100%, -0%
C132	DK1840302	Ceramic, 0.04 μ F +80%, -20%
C133	DK1820302	Ceramic, 0.02 μ F +100%, -0%
C134	DK1820302	Ceramic, 0.02 μ F +100%, -0%
C135	DK1820302	Ceramic, 0.02 μ F +100%, -0%
C136	DK1840302	Ceramic, 0.04 μ F +80%, -20%
C137	DK1840302	Ceramic, 0.04 μ F +80%, -20%
C138	EA1060169	Electroly, 10 μ F, 16V
C139	DD1650101	Ceramic, 500PF \pm 10%
C140	EA1060169	Electroly, 10 μ F, 16V
C141	DD1620101	Ceramic, 200PF \pm 10%
C142	DD1620101	Ceramic, 200PF \pm 10%
C143	DK1840302	Ceramic, 0.04 μ F +80%, -20%
C144	DD1610101	Ceramic, 100PF \pm 10%
C145	DK1820302	Ceramic, 0.02 μ F +100%, -0%
C146	EA1050509	Electroly, 1 μ F, 50V
C147	EA1050509	Electroly, 1 μ F, 50V
C148	DF1722201	Film, 0.0022 μ F \pm 20%
C149	EA3350509	Electroly, 3.3 μ F, 50V
C150	EA1060169	Electroly, 10 μ F, 16V
C151	DF1610201	Film, 0.001 μ F \pm 10%
C152	EA1060169	Electroly, 10 μ F, 16V
C153	EA3360109	Electroly, 33 μ F, 10V
C154	DF1615205	Film, 0.0015 μ F \pm 10%
C155	DF1615205	Film, 0.0015 μ F \pm 10%
C156	EA4740501	Electroly, 0.47 μ F, 50V
C157	EA4740501	Electroly, 0.47 μ F, 50V
C158	DF1633205	Film, 0.0033 μ F \pm 10%
C159	DF1633205	Film, 0.0033 μ F \pm 10%
C160	DD1536101	Film, 360PF \pm 5%
C161	DD1536101	Film, 360PF \pm 5%
C162	DF1518205	Film, 0.0018 μ F \pm 5%
C163	DF1518205	Film, 0.0018 μ F \pm 5%
C164	DF1622205	Film, 0.0022 μ F \pm 10%
C165	DF1622205	Film, 0.0022 μ F \pm 10%
C166	DF1510205	Film, 0.001 μ F \pm 5%
C167	DF1510205	Film, 0.001 μ F \pm 5%
C168	EA4740501	Electroly, 0.47 μ F, 50V
C169	EA4740501	Electroly, 0.47 μ F, 50V
C170	EA2270169	Electroly, 220 μ F, 16V
C171	DF1768201	Film, 0.0068 μ F \pm 20%
C172	DF1722301	Film, 0.022 μ F \pm 20%
C173	DF1740301	Film, 0.04 μ F \pm 20%
C174	DF6539101	Film, 390PF \pm 5%
C175	DD1620001	Ceramic, 20PF \pm 10%
C176	DF1740301	Film, 0.04 μ F \pm 20%
C177	EA4760109	Electroly, 47 μ F, 10V
C178	DK1840302	Ceramic, 0.04 μ F +80%, -20%
C179	DD1530101	Ceramic, 300PF \pm 5%
C180	DD1620101	Ceramic, 200PF \pm 10%
C181	DF1647201	Film, 0.0047 μ F \pm 10%
C182	DF1610301	Film, 0.01 μ F \pm 10%
C183	DK1840302	Ceramic, 0.04 μ F +80%, -20%
C184	EA4740501	Electroly, 0.47 μ F, 50V
C185	DK1840302	Ceramic, 0.04 μ F +80%, -20%
C186	EA1050509	Electroly, 1 μ F, 50V
C187	CT1100008	Trimming, FM OSC
MISCELLANEOUS		
G101	BF4030001	Printed Compo., 0.04 μ F + 270 Ω
G102	BF2230008	Printed Compo., 0.022 μ F + 270 Ω

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
G103	BF2230007	Printed Compo., 0.022 μ F + 680 Ω
G104	BF2230006	Printed Compo., 0.022 μ F + 1K Ω
G105	BF2230006	Printed Compo., 0.022 μ F + 1K Ω
F101	FF1107004	Ceramic Filter, CFS107M
F102	FF1107004	Ceramic Filter, CFS107M
COILS and TRANSFORMERS		
L101	LA1004606	Ant. Coil, FM
L102	LA1027809	RF Coil, FM
L103	LO1203601	OSC Coil, FM
L104	LC1751001	Choke Coil, 0.75 μ H
L105	LI1001601	IFT, FM
L106	LC1223002	Choke Coil, 22 μ H
L107	LI1401623	IFT, FM
L108	LI1015602	IFT, FM
L109	LS1031001	MPX Coil, 19KHz
L110	LS1031004	MPX Coil, 38KHz
L111	LC2576001	Choke Coil, 57mH
L112	LC2576001	Choke Coil, 57mH
L113	LC2446001	Choke Coil, 44mH
L114	LC2446001	Choke Coil, 44mH
L115	LO1001042	OSC Coil, AM
L116	LI1028004	IFT, AM
L117	LI1001048	IFT, AM
SEMICONDUCTORS		
H101	HF200411B	FET, 2SK41E
H102	HT306681C	Transistor, 2SC668C
H103	HT309301C	Transistor, 2SC930C
H104	HT309301C	Transistor, 2SC930C
H105	HT309301C	Transistor, 2SC930C
H106	HT309301C	Transistor, 2SC930C
H107	HT309301C	Transistor, 2SC930C
H108	HT309301C	Transistor, 2SC930C
H109	HT309301C	Transistor, 2SC930C
H110	HT305361G	Transistor, 2SC536G
H111	HT305361E	Transistor, 2SC536E
H112	HT305361E	Transistor, 2SC536E
H113	HT309291C	Transistor, 2SC929C
H114	HC1001703	IC, LA3310
H115	HD1000303	Diode, 1S188FM2
H116	HD1000303	Diode, 1S188FM2
H117	HD2001105	Diode, 1S1555
H118	HD2001105	Diode, 1S1555
H119	HD1000303	Diode, 1S188FM2
H120	HD1000303	Diode, 1S188FM2
H121	HD1000303	Diode, 1S188FM2
H122	HD1000303	Diode, 1S188FM2
H123	HD1000303	Diode, 1S188FM2
H124	HD1000303	Diode, 1S188FM2
H125	HD1000303	Diode, 1S188FM2
H126	HD2001105	Diode, 1S1555
MISCELLANEOUS		
J101	YP1000113	Plug
J104		
J106	YP1000113	Plug
J125		
1903		

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
1904	286710901	Shield
1905	285010902	Shield
1914	62031650W	Lug
1907	138200503	Clamper x 2
P400	YD2886013 ZZ2886013	P.W. Board, Phono EQ P.W. Board Ass'y
RESISTORS		
All resistors are $\pm 5\%$ and $\frac{1}{4}W$, unless otherwise indicated.		
R401	RT0591314	91K Ω
R402	RT0591314	91K Ω
R403	RT0547114	470 Ω
R404	RT0547114	470 Ω
R405	RN1082414	820K Ω $\pm 10\%$, $\frac{1}{4}W$
R406	RN1082414	820K Ω $\pm 10\%$, $\frac{1}{4}W$
R407	RN1010414	100K Ω $\pm 10\%$, $\frac{1}{4}W$
R408	RN1010414	100K Ω $\pm 10\%$, $\frac{1}{4}W$
R409	RT0512414	120K Ω
R410	RT0512414	120K Ω
R411	RT0510314	10K Ω
R412	RT0510314	10K Ω
R413	RT0510414	100K Ω
R414	RT0510414	100K Ω
R415	RT0520114	200 Ω
R416	RT0520114	200 Ω
CAPACITORS		
C401	EE4750251	Electroly, 4.7 μ F $\pm 20\%$, 25V
C402	EE4750251	Electroly, 4.7 μ F $\pm 20\%$, 25V
C403	DD1650001	Ceramic, 50PF $\pm 10\%$, 50V
C404	DD1650001	Ceramic, 50PF $\pm 10\%$, 50V
C405	DF1527305	Film, 0.027 μ F $\pm 5\%$, 50V
C406	DF1527305	Film, 0.027 μ F $\pm 5\%$, 50V
C407	DF1582205	Film, 0.0082 μ F $\pm 5\%$, 50V
C408	DF1582205	Film, 0.0082 μ F $\pm 5\%$, 50V
C409	EA2270069	Electroly, 220 μ F +100%, -10%, 6V
C410	EA2270069	Electroly, 220 μ F +100%, -10%, 6V
C411	EE1050501	Electroly, 1 μ F $\pm 20\%$, 50V
C412	EE1050501	Electroly, 1 μ F $\pm 20\%$, 50V
C413	EA1070359	Electroly, 100 μ F +100%, -10%, 35V
SEMICONDUCTORS		
H401	HC1001105	IC, TA7129P
H402	HC1001105	IC, TA7129P
MISCELLANEOUS		
J401	YP1000113	Plug
J409		
P600	YD2886008 ZZ2886008	P.W. Board, Dolby P.W. Board Ass'y
RESISTORS		
All resistors are $\pm 5\%$ and $\frac{1}{4}W$, unless otherwise indicated.		
R601	RT0547414	470K Ω
R602	RT0547414	470K Ω
R603	RT0510414	100K Ω
R604	RT0510414	100K Ω
R605	RT0533214	3.3K Ω
R606	RT0533214	3.3K Ω
R607	RT0547114	470 Ω

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	
R608	RT0547114	470Ω	
R609	RT0539314	39KΩ	
R610	RT0539314	39KΩ	
R611	RT0568214	6.8KΩ	
R612	RT0568214	6.8KΩ	
R613	RT0510114	100Ω	
R614	RT0510114	100Ω	
R615	RT0522214	2.2KΩ	
R616	RT0522214	2.2KΩ	
R617	RT0512114	120Ω	
R618	RT0512114	120Ω	
R619	RT0556114	560Ω	
R620	RT0556114	560Ω	
R621	RT0533314	33KΩ	
R622	RT0533314	33KΩ	
R623	RT0515414	150KΩ	
R624	RT0515414	150KΩ	
R625	RT0518414	180KΩ	
R626	RT0518414	180KΩ	
R627	RT0527314	27KΩ	
R628	RT0527314	27KΩ	
R629	RT0582214	8.2KΩ	
R630	RT0582214	8.2KΩ	
R631	RT0515414	150KΩ	
R632	RT0515414	150KΩ	
R633	RT0522314	22KΩ	
R634	RT0522314	22KΩ	
R635	RT0527214	2.7KΩ	
R636	RT0527214	2.7KΩ	
R637	RT0533314	33KΩ	
R638	RT0533314	33KΩ	
R639	RT0547414	470KΩ	
R640	RT0547414	470KΩ	
R643	RT0527414	270KΩ	
R644	RT0527414	270KΩ	
R645	RT0547314	47KΩ	
R646	RT0547314	47KΩ	
R647	RT0533214	3.3KΩ	
R648	RT0533214	3.3KΩ	
R649	RT0515214	1.5KΩ	
R650	RT0515214	1.5KΩ	
R651	RT0522314	22KΩ	
R652	RT0522314	22KΩ	
R653	RA0103022	Variable,	10KΩ (B)
R654	RA0103022	Variable,	10KΩ (B)
R655	RT0527214	2.7KΩ	
R656	RT0527214	2.7KΩ	
R657	RT0568414	680KΩ	
R658	RT0568414	680KΩ	
R659	RA0102020	Variable,	1KΩ (B)
R660	RA0102020	Variable,	1KΩ (B)
R661	RT0515314	15KΩ	
R662	RT0515314	15KΩ	
R663	RT0582214	8.2KΩ	
R664	RT0582214	8.2KΩ	
R665	RT0510314	10KΩ	
R666	RT0510314	10KΩ	
R667	RT0582214	8.2KΩ	
R668	RT0582214	8.2KΩ	
R669	RT0582214	8.2KΩ	
R670	RT0582214	8.2KΩ	
R671	RT0533314	33KΩ	
R672	RT0533314	33KΩ	

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	
R673	RT0512414	120KΩ	
R674	RT0512414	120KΩ	
R675	RT0547314	47KΩ	
R676	RT0547314	47KΩ	
R677	RT0527214	2.7KΩ	
R678	RT0527214	2.7KΩ	
R679	RT0510214	1KΩ	
R680	RT0510214	1KΩ	
R681	RT0533014	33Ω	
R682	RT0533014	33Ω	
R683	RT0547014	47Ω	
R684	RT0547014	47Ω	
R685	RT0515314	15KΩ	
R686	RT0515314	15KΩ	
R687	RT0527414	270KΩ	
R688	RT0527414	270KΩ	
R689	RT0527414	270KΩ	
R690	RT0527414	270KΩ	
R691	RT0522414	220KΩ	
R692	RT0522414	220KΩ	
R693	RC1010112	100Ω ± 10%,	½W
CAPACITORS			
C601	EE3350251	Electroly,	3.3μF, 25V
C602	EE3350251	Electroly,	3.3μF, 25V
C603	DF6610101	Film,	100PF ± 10%
C604	DF6610101	Film,	100PF ± 10%
C605	DF1510205	Film,	1000PF ± 5%
C606	DF1510205	Film,	1000PF ± 5%
C607	EA1060169	Electroly,	10μF, 16V
C608	EA1060169	Electroly,	10μF, 16V
C609	EA1060169	Electroly,	10μF, 16V
C610	EA1060169	Electroly,	10μF, 16V
C611	EA1060169	Electroly,	10μF, 16V
C612	EA1060169	Electroly,	10μF, 16V
C613	EA1060169	Electroly,	10μF, 16V
C614	EA1060169	Electroly,	10μF, 16V
C615	DD1582001	Ceramic,	82PF ± 5%
C616	DD1582001	Ceramic,	82PF ± 5%
C617	DF1556205	Film,	5600PF ± 5%
C618	DF1556205	Film,	5600PF ± 5%
C619	DF1527305	Film,	0.027μF ± 5%
C620	DF1527305	Film,	0.027μF ± 5%
C621	DF1547205	Film,	4700PF ± 5%
C622	DF1547205	Film,	4700PF ± 5%
C623	EA1060169	Electroly,	10μF, 16V
C624	EA1060169	Electroly,	10μF, 16V
C625	DF1610405	Film,	0.1μF ± 10%
C626	DF1610405	Film,	0.1μF ± 10%
C627	EA4760109	Electroly,	47μF, 10V
C628	EA4760109	Electroly,	47μF, 10V
C629	DF1610405	Film,	0.1μF ± 10%
C630	DF1610405	Film,	0.1μF ± 10%
C631	EA1060169	Electroly,	10μF, 16V
C632	EA1060169	Electroly,	10μF, 16V
C633	DF1610405	Film,	0.1μF ± 10%
C634	DF1610405	Film,	0.1μF ± 10%
C635	EA1060169	Electroly,	10μF, 16V
C636	EA1060169	Electroly,	10μF, 16V
C637	DF1610405	Film,	0.1μF ± 10%
C638	DF1610405	Film,	0.1μF ± 10%
C639	DF1633405	Film,	0.33μF ± 10%
C640	DF1633405	Film,	0.33μF ± 10%

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
C641	EA2270259	Electroly, 220 μ F, 25V
L601	LC2226004	Choke, 22mH
L602	LC2226004	Choke, 22mH
COILS		
SEMICONDUCTORS		
H601	HT306441B	Transistor, 2SC644 S
H602	HT306441B	Transistor, 2SC644 S
H603	HT306441B	Transistor, 2SC644 S
H604	HT306441B	Transistor, 2SC644 S
H605	HT104941C	Transistor, 2SA494 Y
H606	HT104941C	Transistor, 2SA494 Y
H607	HT306441B	Transistor, 2SC644 S
H608	HT306441B	Transistor, 2SC644 S
H609	HT306441B	Transistor, 2SC644 S
H610	HT306441B	Transistor, 2SC644 S
H611	HF200301E	Transistor, 2SK30 AD
H612	HF200301E	Transistor, 2SK30 AD
H613	HT306441B	Transistor, 2SC644 S
H614	HT306441B	Transistor, 2SC644 S
H615	HT104941C	Transistor, 2SA494 Y
H616	HT104941C	Transistor, 2SA494 Y
H617	HT306441B	Transistor, 2SC644 S
H618	HT306441B	Transistor, 2SC644 S
H621	HD1000105	Diode, 1N60
H622	HD1000105	Diode, 1N60
H623	HD2000121	Diode, 1S2473
H624	HD2000121	Diode, 1S2473
H625	HD3003109	Diode, WZ-081
H626	HD2000121	Diode, 1S2473
H627	HD2000121	Diode, 1S2473
H628	HD2000121	Diode, 1S2473
H629	HD2000121	Diode, 1S2473
MISCELLANEOUS		
J601 ? J608	YP1000109	Plug
J611 ? J621	YP1000109	Plug
1430	51570305B	P.H. Tapt Screw x 4
1432	288616003	Bracket
1433	288616004	Bracket x 2
1434	51100305S	B.H.M. Screw x 4
2036	54050300R	T.L. Washer OR x 2
1810	281810104	Support x 2
1816	51100306S	B.H.M. Screw x 8
1824	54020401A	Flat Washer x 2
1826	54040402N	Spring Washer x 2
P700	YD2886004 ZZ2886004	P.W. Board, Main Amp. x 2 P.W. Board Ass'y x 2
RESISTORS		
All resistors are $\pm 5\%$ and $\frac{1}{2}W$, unless otherwise indicated.		
R701	RT0556314	56K Ω x 2
R702	RT0510214	1K Ω x 2

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R703	RT0522414	220K Ω x 2
R704	RT0533414	330K Ω x 2
R705	RT0556214	5.6K Ω x 2
R706	RT0513314	13K Ω x 2
R707	RT0556214	5.6K Ω x 2
R708	RT0556214	5.6K Ω x 2
R709	RT0522414	220K Ω x 2
R710	RT0556214	5.6K Ω x 2
R711	RT0547314	47K Ω x 2
R712	RT0547314	47K Ω x 2
R713	RT0515514	1.5M Ω x 2
R714	RT0515514	1.5M Ω x 2
R715	RT0510114	100 Ω x 2
R716	RT0510114	100 Ω x 2
R717	RT0568214	6.8K Ω x 2
R718	RT0568214	6.8K Ω x 2
R719	RT0522314	22K Ω x 2
R720	RT0522314	22K Ω x 2
R721	RT0516214	1.6K Ω x 2
R722	RT0516214	1.6K Ω x 2
R723	RT0516314	16K Ω x 2
R724	RT0516314	16K Ω x 2
R725	RT0515414	150K Ω x 2
R726	RT0515414	150K Ω x 2
R727	RA0204005	Variable, 200K Ω (B) x 2
R728	RA0204005	Variable, 200K Ω (B) x 2
R729	RT0510114	100 Ω x 2
R730	RT0510114	100 Ω x 2
R731	RT0527214	2.7K Ω x 2
R732	RT0527214	2.7K Ω x 2
R733	RT0539214	3.9K Ω x 2
R734	RT0539214	3.9K Ω x 2
R735	RT0582214	8.2K Ω x 2
R736	RT0582214	8.2K Ω x 2
R737	RA0501010	Variable, 500 Ω (B) x 2
R738	RA0501010	Variable, 500 Ω (B) x 2
R739	RT0551314	51K Ω x 2
R740	RT0551314	51K Ω x 2
R741	GF0533114	330 Ω x 2
R742	GF0533114	330 Ω x 2
R743	GF0533114	330 Ω x 2
R744	GF0533114	330 Ω x 2
R745	RT0551314	51K Ω x 2
R746	RT0551314	51K Ω x 2
R747	GF0522014	22 Ω x 2
R748	GF0522014	22 Ω x 2
R749	GF0533114	330 Ω x 2
R750	GF0533114	330 Ω x 2
R751	GF0533114	330 Ω x 2
R752	GF0533114	330 Ω x 2
R753	GF0582114	820 Ω x 2
R754	GF0582114	820 Ω x 2
R755	GF0582114	820 Ω x 2
R756	GF0582114	820 Ω x 2
R757	GF0539014	39 Ω x 2
R758	GF0539014	39 Ω x 2
R759	RW1000503	0.5 Ω \pm 10%, 3W x 2
R760	RW1000503	0.5 Ω \pm 10%, 3W x 2
R761	RW1000503	0.5 Ω \pm 10%, 3W x 2
R762	RW1000503	0.5 Ω \pm 10%, 3W x 2
R763	RC1002212	2.2 Ω \pm 10%, $\frac{1}{2}W$ x 2
R764	RC1002212	2.2 Ω \pm 10%, $\frac{1}{2}W$ x 2
R765	RC1010012	10 Ω \pm 10%, $\frac{1}{2}W$ x 2

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R766	RC1010012	10Ω ± 10%, ½W x 2
R767	RJ1010101	100Ω ± 10%, 1W x 2
R768	RJ1010101	100Ω ± 10%, 1W x 2
R769	RC1047012	47Ω ± 10%, ½W x 2
R770	RC1047012	47Ω ± 10%, ½W x 2
SEMICONDUCTORS		
H701	HT313272A	Transistor, 2SC1327 S or T x 2
H702	HT313272A	Transistor, 2SC1327 S or T x 2
H703	HT313272A	Transistor, 2SC1327 S or T x 2
H704	HT313182B	Transistor, 2SC1318 Q or R x 2
H705	HT313182B	Transistor, 2SC1318 Q or R x 2
H706	HT309451Q	Transistor, 2SC945 Q x 2
H707	HT309451Q	Transistor, 2SC945 Q x 2
H708	HT106411M	Transistor, 2SA641 M x 2
H709	HT106411M	Transistor, 2SA641 M x 2
H710	HT313841F	Transistor, 2SC1384 F or G x 2
H711	HT313841F	Transistor, 2SC1384 F or G x 2
H712	HT106841F	Transistor, 2SA684 F or G x 2
H713	HT106841F	Transistor, 2SA684 F or G x 2
H714	HD1000105	Diode, 1N60 x 2
H715	HD1000105	Diode, 1N60 x 2
H716	HD1000105	Diode, 1N60 x 2
H717	HD1000105	Diode, 1N60 x 2
H718	HV0000205	Diode, M8513 A-O x 2
H719	HV0000205	Diode, M8513 A-O x 2
CAPACITORS		
C701	DF1622405	Film, 0.22μF ± 10%, 50V x 2
C702	EA4760509	Electroly, 47μF +100%, -10%, 50V x 2
C703	EE1050501	Electroly, 1μF ± 20%, 50V x 2
C704	EE1050501	Electroly, 1μF ± 20%, 50V x 2
C705	DD1530101	Ceramic, 300PF ± 5%, 50V x 2
C706	DD1530101	Ceramic, 300PF ± 5%, 50V x 2
C707	EA4760509	Electroly, 47μF +100%, -10%, 50V x 2
C708	EA4760509	Electroly, 47μF +100%, -10%, 50V x 2
C709	DF1647405	Film, 0.47μF ± 10%, 50V x 2
C710	DD1650001	Ceramic, 50PF ± 10%, 50V x 2
C711	DD1650001	Ceramic, 50PF ± 10%, 50V x 2
C712	EA1060359	Electroly, 10μF +100%, -10%, 35V x 2
C713	EA1060359	Electroly, 10μF +100%, -10%, 35V x 2
C714	DD1630001	Ceramic, 30PF ± 10%, 50V x 2
C715	DD1630001	Ceramic, 30PF ± 10%, 50V x 2
C716	EA1070109	Electroly, 100μF +100%, -10%, 10V x 2
C717	EA1070109	Electroly, 100μF +100%, -10%, 10V x 2
C718	EA4760509	Electroly, 47μF +100%, -10%, 50V x 2
C719	EA4760509	Electroly, 47μF +100%, -10%, 50V x 2
C720	EA2260509	Electroly, 22μF +100%, -10%, 50V x 2
C721	EA2260509	Electroly, 22μF +100%, -10%, 50V x 2
C722	DD1650001	Ceramic, 50PF ± 10%, 50V x 2
C723	DD1650001	Ceramic, 50PF ± 10%, 50V x 2
C724	DD1650001	Ceramic, 50PF ± 10%, 50V x 2
C725	DD1650001	Ceramic, 50PF ± 10%, 50V x 2
C726	EB3380353	Electroly, 3300μF +100%, -10%, 35V x 2
C727	EB3380353	Electroly, 3300μF +100%, -10%, 35V x 2
C728	DF1710405	Film, 0.1μF ± 20%, 50V x 2
C729	DF1710405	Film, 0.1μF ± 20%, 50V x 2
COILS		
L701	LL2391512	Choke Coil x 2
L702	LL2391512	Choke Coil x 2
SEMICONDUCTORS		
H001	HT307892A	Transistor, 2SC789 O or Y x 2
H002	HT307892A	Transistor, 2SC789 O or Y x 2
H003	HT307892A	Transistor, 2SC789 O or Y x 2

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
H004	HT307892A	Transistor, 2SC789 O or Y x 2
H005	HV0000212	Diode, SV 3X x 2
H006	HV0000212	Diode, SV 3X x 2
MISCELLANEOUS		
J701	YP1000114	Plug x 2
J706		
J707	YP1000091	Plug x 2
J708	YP1000091	Plug x 2
J709	YP1000114	Plug x 2
J726		
1802	285126701	Heat Sink x 2
1804	282016007	Bracket x 4
1806	285116006	Bracket x 4
1808	282026702	Heat Sink x 4
1818	51380306P	P.H. Tapt Screw x 8
1820	51380306P	P.H. Tapt Screw x 16
1822	51100308S	B.H.M. Screw x 4
1828	51060312E	P.H.M. Screw x 8
1830	54040302N	Spring Washer x 8
1832	62031340W	Lug x 8
1834	53110303E	Hexagon Nut x 8
P800	YD2886006 ZZ2886006	P.W. Board, Power Supply P.W. Board Ass'y
RESISTORS		
All resistors are ±5% and ¼W, unless otherwise indicated.		
R801	RA0502010	Variable, 5KΩ (B)
R802	GJ0527102	270Ω ± 5%, 2W
R803	RT0527314	27KΩ
R804	RT0536314	36KΩ
R805	GJ0533102	330Ω ± 5%, 2W
R806	RT0510314	10KΩ
R807	RT0522214	2.2KΩ
R808	RT0562214	6.2KΩ
R809	GJ0547003	47Ω ± 5%, 3W
R810	RC1010112	100Ω ± 10%, ¼W
R811	RW1000503	0.5Ω ± 10%, 3W
R812	RC1039012	39Ω ± 10%, ¼W
CAPACITORS		
C801	EA3350509	Electroly, 3.3μF +100%, -10%, 50V
C802	EA4770169	Electroly, 470μF +100%, -10%, 16V
C803	EA3370509	Electroly, 330μF +100%, -10%, 50V
C804	EA3370631	Electroly, 330μF +100%, -10%, 63V
C805	EA4770109	Electroly, 470μF +100%, -10%, 10V
C806	DK1840302	Ceramic, 0.04μF +100%, -0%, 50V
C807	DF1747305	Film, 0.047μF ± 20%, 50V
C808	DK1810351	Ceramic, 0.01μF +100%, -0%, 500V
SEMICONDUCTORS		
H801	HT403152B	Transistor, 2SD315 C or D
H802	HT309451P	Transistor, 2SC945 P
H803	HT309451Q	Transistor, 2SC945 Q
H804	HD3002709	Diode, WZ-140
H805	HD2000413	Diode, SIB01-02
H806	HD2000413	Diode, SIB01-02
H807	HD2000413	Diode, SIB01-02
H808	HD2000413	Diode, SIB01-02
H809	HD2000413	Diode, SIB01-02

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
H810	HD20001Z1	Diode, 1S2473
MISCELLANEOUS		
J801 } J810	YP1000113	Plug
J816 } J818	YP1000113	Plug
1533	273026702	Heat Sink
3136	54050300R	T.L. Washer OR x 2
1534	53110303E	Hexagon Nut x 2
PD01	YD2886007 ZZ2886007	P.W. Board, Buffer P.W. Board Ass'y
RESISTORS All resistors are $\pm 5\%$ and $\frac{1}{4}W$, unless otherwise indicated.		
RD01	RT0547414	470K Ω
RD02	RT0547414	470K Ω
RD03	RT0547414	470K Ω
RD04	RT0547414	470K Ω
RD05	RT0510214	1K Ω
RD06	RT0510214	1K Ω
RD07	RT0510214	1K Ω
RD08	RT0510214	1K Ω
RD09	RT0524414	240K Ω
RD10	RT0524414	240K Ω
RD11	RT0524414	240K Ω
RD12	RT0524414	240K Ω
RD13	RT0591414	910K Ω
RD14	RT0591414	910K Ω
RD15	RT0591414	910K Ω
RD16	RT0591414	910K Ω
RD17	GU0522212	2.2K $\Omega \pm 5\%$, $\frac{1}{2}W$
RD18	GU0522212	2.2K $\Omega \pm 5\%$, $\frac{1}{2}W$
RD19	GU0522212	2.2K $\Omega \pm 5\%$, $\frac{1}{2}W$
RD20	GU0522212	2.2K $\Omega \pm 5\%$, $\frac{1}{2}W$
RD21	RT0547314	47K Ω
RD22	RT0547314	47K Ω
RD23	RT0547314	47K Ω
RD24	RT0547314	47K Ω
CAPACITORS		
CD01	EE1050501	Electroly, 1 $\mu F \pm 20\%$, 50V
CD02	EE1050501	Electroly, 1 $\mu F \pm 20\%$, 50V
CD03	EE1050501	Electroly, 1 $\mu F \pm 20\%$, 50V
CD04	EE1050501	Electroly, 1 $\mu F \pm 20\%$, 50V
CD05	EE1060351	Electroly, 10 $\mu F \pm 20\%$, 35V
CD06	EE1060351	Electroly, 10 $\mu F \pm 20\%$, 35V
CD07	EE1060351	Electroly, 10 $\mu F \pm 20\%$, 35V
CD08	EE1060351	Electroly, 10 $\mu F \pm 20\%$, 35V
CD09	EE1070359	Electroly, 100 $\mu F +100\%$, -10%, 35V
CD10	DD1620101	Electroly, 200PF $\pm 10\%$, 50V
CD11	DD1620101	Electroly, 200PF $\pm 10\%$, 50V
CD12	DD1620101	Electroly, 200PF $\pm 10\%$, 50V
CD13	DD1620101	Electroly, 200PF $\pm 10\%$, 50V
SEMICONDUCTORS		
HD01	HT313181S	Transistor, 2SC1318 S
HD02	HT313181S	Transistor, 2SC1318 S
HD03	HT313181S	Transistor, 2SC1318 S
HD04	HT313181S	Transistor, 2SC1318 S

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
MISCELLANEOUS		
JD01	YP1000113	Plug
JD02	YP1000113	Plug
JD03	YP1000113	Plug
JD04	YP1000113	Plug
JD05	YP1000113	Plug
JD06	YP1000113	Plug
JD07	YP1000113	Plug
JD08	YP1000113	Plug
JD09	YP1000113	Plug
JD10	YP1000113	Plug
JD11	YP1000113	Plug
JD12	YP1000113	Plug
JD13	YP1000113	Plug
PE01	YD2886015 ZZ2886015	P.W. Board, Tone Amp. P.W. Board Ass'y
RESISTORS All resistors are $\pm 5\%$ and $\frac{1}{4}W$.		
RE05	RT0539114	390 Ω
RE06	RT0539114	390 Ω
RE07	RT0539114	390 Ω
RE08	RT0539114	390 Ω
RE09	RT0547314	47K Ω
RE10	RT0547314	47K Ω
RE11	RT0547314	47K Ω
RE12	RT0547314	47K Ω
RE13	RT0512514	1.2M Ω
RE14	RT0512514	1.2M Ω
RE15	RT0512514	1.2M Ω
RE16	RT0512514	1.2M Ω
RE21	RT0527314	27K Ω
RE22	RT0527314	27K Ω
RE23	RT0527314	27K Ω
RE24	RT0527314	27K Ω
RE25	RT0510214	1K Ω
RE26	RT0510214	1K Ω
RE27	RT0510214	1K Ω
RE28	RT0510214	1K Ω
RE29	RT0575214	7.5K Ω
RE30	RT0575214	7.5K Ω
RE31	RT0575214	7.5K Ω
RE32	RT0575214	7.5K Ω
RE33	RT0510214	1K Ω
RE34	RT0510214	1K Ω
RE35	RT0510214	1K Ω
RE36	RT0510214	1K Ω
RE37	RT0547414	470K Ω
RE38	RT0547414	470K Ω
RE39	RT0547414	470K Ω
RE40	RT0547414	470K Ω
RE41	RT0520514	2M Ω
RE42	RT0520514	2M Ω
RE43	RT0520514	2M Ω
RE44	RT0520514	2M Ω
RE45	RT0556314	56K Ω
RE46	RT0556314	56K Ω
RE47	RT0556314	56K Ω
RE48	RT0556314	56K Ω
RE49	RT0510314	10K Ω
RE50	RT0510314	10K Ω

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
RE51	RT0510314	10K Ω
RE52	RT0510314	10K Ω
RE53	RT0510314	10K Ω
RE54	RT0510314	10K Ω
RE55	RT0510314	10K Ω
RE56	RT0510314	10K Ω
RE57	RT0522114	220 Ω
RE58	RT0522114	220 Ω
RE59	RT0522114	220 Ω
RE60	RT0522114	220 Ω
RE61	RT0510114	100 Ω
CAPACITORS		
CE01	EE4750251	Electroly, 4.7 μ F \pm 20%, 25V
CE02	EE4750251	Electroly, 4.7 μ F \pm 20%, 25V
CE03	EE4750251	Electroly, 4.7 μ F \pm 20%, 25V
CE04	EE4750251	Electroly, 4.7 μ F \pm 20%, 25V
CE05	EE4740501	Electroly, 0.47 μ F \pm 20%, 50V
CE06	EE4740501	Electroly, 0.47 μ F \pm 20%, 50V
CE07	EE4740501	Electroly, 0.47 μ F \pm 20%, 50V
CE08	EE4740501	Electroly, 0.47 μ F \pm 20%, 50V
CE09	EE1050501	Electroly, 1 μ F \pm 20%, 50V
CE10	EE1050501	Electroly, 1 μ F \pm 20%, 50V
CE11	EE1050501	Electroly, 1 μ F \pm 20%, 50V
CE12	EE1050501	Electroly, 1 μ F \pm 20%, 50V
CE13	EA1060359	Electroly, 10 μ F +100%, -10%, 35V
CE14	EA1060359	Electroly, 10 μ F +100%, -10%, 35V
CE15	EA1060359	Electroly, 10 μ F +100%, -10%, 35V
CE16	EA1060359	Electroly, 10 μ F +100%, -10%, 35V
CE17	EE3350501	Electroly, 3.3 μ F \pm 20%, 50V
CE18	EE3350501	Electroly, 3.3 μ F \pm 20%, 50V
CE19	EE3350501	Electroly, 3.3 μ F \pm 20%, 50V
CE20	EE3350501	Electroly, 3.3 μ F \pm 20%, 50V
CE25	EE1050501	Electroly, 1 μ F \pm 20%, 50V
CE26	EE1050501	Electroly, 1 μ F \pm 20%, 50V
CE27	EE1050501	Electroly, 1 μ F \pm 20%, 50V
CE28	EE1050501	Electroly, 1 μ F \pm 20%, 50V
CE29	EA1070359	Electroly, 100 μ F +100%, -10%, 35V
SEMICONDUCTORS		
HE01	HT313271S	Transistor, 2SC1327 S
HE02	HT313271S	Transistor, 2SC1327 S
HE03	HT313271S	Transistor, 2SC1327 S
HE04	HT313271S	Transistor, 2SC1327 S
HE05	HT107331Q	Transistor, 2SA733 Q
HE06	HT107331Q	Transistor, 2SA733 Q
HE07	HT107331Q	Transistor, 2SA733 Q
HE08	HT107331Q	Transistor, 2SA733 Q
HE09	HT309451Q	Transistor, 2SC945 Q
HE10	HT309451Q	Transistor, 2SC945 Q
HE11	HT309451Q	Transistor, 2SC945 Q
HE12	HT309451Q	Transistor, 2SC945 Q
HE13	HT107331Q	Transistor, 2SA733 Q
HE14	HT107331Q	Transistor, 2SA733 Q
HE15	HT107331Q	Transistor, 2SA733 Q
HE16	HT107331Q	Transistor, 2SA733 Q
MISCELLANEOUS		
JE01 } JE25	YP1000113	Plug
PL01	YD2886009 ZZ2886009	P.W. Board, Dolby Tone & Meter P.W. Board Ass'y

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
RESISTORS		
All resistors are \pm 5% and $\frac{1}{4}$ W, unless otherwise indicated.		
RL01	RT0533214	3.3K Ω
RL02	RT0547314	47K Ω
RL03	RT0510114	100 Ω
RL04	RT0533214	3.3K Ω
RL05	RT0510214	1K Ω
RL06	RT0512314	12K Ω
RL07	RT0547314	47K Ω
RL08	RC1010212	1K Ω \pm 10%, $\frac{1}{2}$ W
RL09	RT0547214	4.7K Ω
RL10	RT0510214	1K Ω
RL11	RA0501012	Trimming, 500 Ω (B)
RL12	RA0502019	Trimming, 5K Ω (B)
RL13	RT0556314	56K Ω
RL14	RT0556314	56K Ω
RL15	RT0547214	4.7K Ω
RL20	RT0568414	680K Ω
RL21	RT0568414	680K Ω
RL22	RT0533414	330K Ω
RL23	RT0533414	330K Ω
RL24	RT0533214	3.3K Ω
RL25	RT0533214	3.3K Ω
RL26	RT0515214	1.5K Ω
RL27	RT0515214	1.5K Ω
RL28	RA0152004	Trimming, 1.5K Ω (B)
RL29	RA0152004	Trimming, 1.5K Ω (B)
CAPACITORS		
CL01	DF1515305	Film, 0.015 μ F \pm 5%
CL02	DF1515305	Film, 0.015 μ F \pm 5%
CL03	DF1668301	Film, 0.068 μ F \pm 10%
CL04	DF1710402	Film, 0.1 μ F \pm 20%
CL05	EA1060169	Electroly, 10 μ F, 16V
CL06	EA1060169	Electroly, 10 μ F, 16V
CL07	EA1060169	Electroly, 10 μ F, 16V
CL10	EA1060169	Electroly, 10 μ F, 16V
CL11	EA1060169	Electroly, 10 μ F, 16V
CL12	EA1060169	Electroly, 10 μ F, 16V
CL13	EA1060169	Electroly, 10 μ F, 16V
CL14	EA3360359	Electroly, 33 μ F, 35V
HL01	HT307331C	Transistor, 2SC733 GR
HL02	HT307331C	Transistor, 2SC733 GR
HL03	HT307331C	Transistor, 2SC733 GR
HL06	HT307331C	Transistor, 2SC733 GR
HL07	HT307331C	Transistor, 2SC733 GR
HL08	HD1000105	Diode, 1N60
HL09	HD1000105	Diode, 1N60
HL10	HD1000105	Diode, 1N60
HL11	HD1000105	Diode, 1N60
SEMICONDUCTORS		
JL01 } JL09	YP1000113	Plug
0903	288616050	Bracket K
0909	288612201	Sticker
0913	257710602	Bearing
0914	141511801	Spacer
0915	51040306A	F.H.M. Screw x 2
0920	51100306S	B.H.M. Screw x 3
0927	51100305A	B.H.M. Screw x 2
MISCELLANEOUS		

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0933	51102604A	B.H.M. Screw x 2
0934	51102604A	B.H.M. Screw x 2
0935	288610903	Shield
1003	281816003	Bracket
1004	281816004	Bracket
1005	51100406A	B.H.M. Screw x 4
1011	51102605A	B.H.M. Screw x 6
1012	51060305A	P.H.M. Screw x 8
1131	51042608A	F.H.M. Screw x 2
1221	51570306B	P.H. Tapt Screw x 2
1222	54050300R	T.L. Washer OR x 2
1225	288610701	Sheet x 2
1616	51470306A	B.H.M. Screw S x 2
1704	285326901	Protector
1708	281912004	Insulator
1714	51570305B	P.H. Tapt Screw x 2
1721	287105302	Cover x 2
M004	IM1104209	D.C. Meter, Signal
M005	IM1104202	D.C. Meter, Center
C004	EA1070109	Electroly Cap., 100 μ F +100%,-10%, 10V
C008	EA1070109	Electroly Cap., 100 μ F +100%,-10%, 10V
P500	YD2886012 ZZ2886012	P.W. Board, Vari-Matrix P.W. Board Ass'y
RESISTORS		
All resistors are $\pm 5\%$ and $\frac{1}{4}W$, unless otherwise indicated.		
R501	RT0515414	150K Ω
R502	RT0515414	150K Ω
R503	RT0556314	56K Ω
R504	RT0556314	56K Ω
R505	RT0522414	220K Ω
R506	RT0522414	220K Ω
R507	RT0533414	330K Ω
R508	RT0533414	330K Ω
R509	RT0556214	5.6K Ω
R510	RT0556214	5.6K Ω
R511	RT0556214	5.6K Ω
R512	RT0556214	5.6K Ω
R513	RT0568214	6.8K Ω
R514	RT0568214	6.8K Ω
R515	RT0568214	6.8K Ω
R516	RT0568214	6.8K Ω
R517	RT0547314	47K Ω
R518	RT0547314	47K Ω
R519	RT0547314	47K Ω
R520	RT0547314	47K Ω
R521	RT0520314	20K Ω
R522	RT0520314	20K Ω
R523	RT0533414	330K Ω
R524	RT0533414	330K Ω
R525	RT0510414	100K Ω
R526	RT0510414	100K Ω
R527	RT0556214	5.6K Ω
R528	RT0556214	5.6K Ω
R529	RT0522314	22K Ω
R530	RT0522314	22K Ω
R531	RT0522114	220 Ω
R532	RM0503054	Variable, 50K Ω (B), Dimension

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
MISCELLANEOUS		
J501 }	YP1000113	Plug
J506		
CAPACITORS		
C501	EE4740501	Electroly, 0.47 μ F \pm 20%, 50V
C502	EE4740501	Electroly, 0.47 μ F \pm 20%, 50V
C503	EE3350501	Electroly, 3.3 μ F \pm 20%, 50V
C504	EE3350501	Electroly, 3.3 μ F \pm 20%, 50V
C505	EE3350501	Electroly, 3.3 μ F \pm 20%, 50V
C506	EE3350501	Electroly, 3.3 μ F \pm 20%, 50V
C507	DF1647305	Film, 0.047 μ F \pm 10%, 50V
C508	DF1647305	Film, 0.047 μ F \pm 10%, 50V
C509	DF1647305	Film, 0.047 μ F \pm 10%, 50V
C510	DF1647305	Film, 0.047 μ F \pm 10%, 50V
C511	EE3350501	Electroly, 3.3 μ F \pm 20%, 50V
C512	EE3350501	Electroly, 3.3 μ F \pm 20%, 50V
C513	EA1070109	Electroly, 100 μ F +100%, -10%, 10V
C514	EA1070109	Electroly, 100 μ F +100%, -10%, 10V
C515	EE3350501	Electroly, 3.3 μ F \pm 20%, 50V
C516	EE3350501	Electroly, 3.3 μ F \pm 20%, 50V
C517	DD1650001	Ceramic, 50PF \pm 10%, 50V
C518	DD1650001	Ceramic, 50PF \pm 10%, 50V
C519	DF1610205	Film, 0.001 μ F \pm 20%, 50V
C520	DF1610205	Film, 0.001 μ F \pm 20%, 50V
C521	EA1070359	Electroly, 100 μ F +100%, -10%, 35V
SEMICONDUCTORS		
H501	HT313272A	Transistor, 2SC1327 S or T
H502	HT313272A	Transistor, 2SC1327 S or T
H503	HC1000705	IC, TA7122 AP B or C
H504	HC1000705	IC, TA7122 AP B or C
PF01	YD2886002 ZZ2886002	P.W. Board, Tone Vol. Ass. P.W. Board Ass'y
RESISTORS		
All resistors are $\pm 5\%$ and $\frac{1}{4}W$, unless otherwise indicated.		
RF01	RU0204001	Variable, 200K Ω (B)
RF02	RU0204001	Variable, 200K Ω (B)
RF03	RT0527314	27K Ω
RF04	RT0527314	27K Ω
RF05	RT0527314	27K Ω
RF06	RT0527314	27K Ω
RF07	RT0527314	27K Ω
RF08	RT0527314	27K Ω
RF09	RT0527314	27K Ω
RF10	RT0527314	27K Ω
RF11	RT0510414	100K Ω
RF12	RT0510414	100K Ω
RF13	RT0510414	100K Ω
RF14	RT0510414	100K Ω
RF15	RT0539314	39K Ω
RF16	RT0539314	39K Ω
RF17	RT0539314	39K Ω
RF18	RT0539314	39K Ω
RF27	RT0568414	680K Ω
RF28	RT0568414	680K Ω
RF29	RT0568414	680K Ω

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
RF30	RT0568414	680K Ω
CAPACITORS		
CF01	DF1615305	Film, 0.015 μ F \pm 10%, 50V
CF02	DF1615305	Film, 0.015 μ F \pm 10%, 50V
CF03	DF1615305	Film, 0.015 μ F \pm 10%, 50V
CF04	DF1615305	Film, 0.015 μ F \pm 10%, 50V
CF05	DF1615305	Film, 0.015 μ F \pm 10%, 50V
CF06	DF1615305	Film, 0.015 μ F \pm 10%, 50V
CF07	DF1615305	Film, 0.015 μ F \pm 10%, 50V
CF08	DF1615305	Film, 0.015 μ F \pm 10%, 50V
CF09	DD1520101	Ceramic, 200PF \pm 5%, 50V
CF10	DD1520101	Ceramic, 200PF \pm 5%, 50V
CF11	DD1520101	Ceramic, 200PF \pm 5%, 50V
CF12	DD1520101	Ceramic, 200PF \pm 5%, 50V
MISCELLANEOUS		
JF01 } JF12	YP1000113	Plug
PS01	YD2886005 ZZ2886005	P.W. Board, Switch P.W. Board Ass'y
RESISTORS All resistors are \pm 5% and $\frac{1}{4}$ W.		
RS01	RT0515314	15K Ω
RS02	RT0515314	15K Ω
RS03	RT0515314	15K Ω
RS04	RT0515314	15K Ω
RS05	RT0533214	3.3K Ω
RS06	RT0533214	3.3K Ω
RS07	RT0533214	3.3K Ω
RS08	RT0533214	3.3K Ω
RS09	RT0547214	4.7K Ω
RS10	RT0547214	4.7K Ω
RS11	RT0547214	4.7K Ω
RS12	RT0547214	4.7K Ω
RS13	RT0510514	1M Ω
RS14	RT0510514	1M Ω
RS15	RT0510514	1M Ω
RS16	RT0510514	1M Ω
CAPACITORS		
CS01	DF1610205	Film, 0.001 μ F \pm 10%, 50V
CS02	DF1610205	Film, 0.001 μ F \pm 10%, 50V
CS03	DF1610205	Film, 0.001 μ F \pm 10%, 50V
CS04	DF1610205	Film, 0.001 μ F \pm 10%, 50V
CS05	EM1040251	Electroly, 0.1 μ F \pm 20%, 25V
CS06	EM1040251	Electroly, 0.1 μ F \pm 20%, 25V
CS07	EM1040251	Electroly, 0.1 μ F \pm 20%, 25V
CS08	EM1040251	Electroly, 0.1 μ F \pm 20%, 25V
CS09	DF1682205	Film, 0.0082 μ F \pm 10%, 50V
CS10	DF1682205	Film, 0.0082 μ F \pm 10%, 50V
CS11	DF1682205	Film, 0.0082 μ F \pm 10%, 50V
CS12	DF1682205	Film, 0.0082 μ F \pm 10%, 50V
MISCELLANEOUS		
JS01 } JS08	YP1000113	Plug
SS01	SP0706001	Push Switch, 6 Keys

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
6136	62031650W	Lug
PT01	YD2886011 ZZ2886011	P.W. Board, Tape Mon., Sw P.W. Board Ass'y
MISCELLANEOUS		
ST01	SP0802001	Push Switch, Tape Mon.
RT01	RT0510214	Resistor, 1K Ω \pm 5%, $\frac{1}{4}$ W
RT02	RT0510214	Resistor, 1K Ω \pm 5%, $\frac{1}{4}$ W
RT03	RT0510214	Resistor, 1K Ω \pm 5%, $\frac{1}{4}$ W
RT04	RT0510214	Resistor, 1K Ω \pm 5%, $\frac{1}{4}$ W
JT01 } JT06	YP1000113	Plug
PY01	YD2886010 ZZ2886010	P.W. Board, Function Lamp P.W. Board Ass'y
MISCELLANEOUS		
MY01	IN1006301	Lamp, AM, 40mA
MY02	IN1006301	Lamp, FM, 40mA
MY03	IN1006301	Lamp, Stereo, 40mA
MY04	IN1006301	Lamp, Dolby, 40mA
MY05	IN1006302	Lamp, 4, 180mA
RY01	RC1002712	Resistor, 2.7 Ω \pm 10%, $\frac{1}{2}$ W
JY01 } JY10	YP1000113	Plug
1108	288627101	Holder
1109	51570305B	P.H. Tapt Screw x 2
PZ01	YD2886016 ZZ2886016	P.W. Board, Dial Lamp P.W. Board
MISCELLANEOUS		
MZ01 } MZ05	IN1008007	Lamp, Dial
JZ01 } JZ10	YJ0800017	Socket
JZ11	YP1000113	Plug
JZ12	YP1000113	Plug
1105	287127101	Holder
1106	51570305B	P.H. Tapt Screw x 2
PG01	YD2886003 ZZ2886003	P.W. Board, Balance P.W. Board Ass'y
RESISTORS All resistors are \pm 5% and $\frac{1}{4}$ W, unless otherwise indicated.		
RG01	RT0533214	3.3K Ω
RG02	RT0533214	3.3K Ω
RG03	RT0533214	3.3K Ω
RG04	RT0533214	3.3K Ω
RG05	RX0503006	Variable, 20K Ω (G)
RG06	RX0503006	Variable, 20K Ω (G)

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
RG07	RS0503017	Variable, 20KΩ(G)
JG01 JG09	YP1000113	MISCELLANEOUS Plug
R001	RG0503002	Variable, 50KΩ(B), Volume
R002	RK0504010	Variable, Dol. Rec. Cal.
R003	RK0504010	Variable, Dol. Rec. Cal.
R004	RK0504010	Variable, Dol. Play Cal.
R005	RK0504010	Variable, Dol. Play Cal.
R009	RT0518314	18KΩ ± 5%, ¼W
R010	RT0515214	1.5KΩ ± 5%, ¼W
R015	RT0539214	3.9KΩ ± 5%, ¼W
C002	EA4760169	Electroly Cap., 47μF +100%, -10%, 16V
C001	DK1710301	Ceramic Cap., 0.01μF ± 20%, 50V
J001	YT0208002	Terminal, 8P
J002	YT0208002	Terminal, 8P
J003	YT0204003	Terminal, 4P
J004	YT0202007	Terminal, 2P
J011	YJ0700006	Jack, SQ Decoder
J012	YJ0100065	Jack, Head Phone
J013	YJ0100065	Jack, Head Phone
J018	YJ0800019	Socket
J019	YJ0800019	Socket
S001	SR1506002	Rotary Switch, Selector
S002	SR1205002	Rotary Switch, Mode
S003	SR2505001	Rotary Switch, Dolby
S007	SP0801001	Push Switch, 400Hz Tone
S008	SP0201009	Push Switch, Meter L-R
M002	IN1008007	Lamp
M003	IN1008007	Lamp
0918	288612003	Insulator
0926	288616010	Bracket
0931	285310901	Shield
0932	282112001	Insulator
1103	287127401	Reflector
1111	51100305A	B.H.M. Screw x 2
1113	51480306A	B.H.M. Screw F x 2
1116	203912001	Insulator
1121	287105102	Guide
1123	288626252	Pulley K
1128	51100305A	B.H.M. Screw x 2
1203	288627401	Reflector
1205	288626251	Pulley K
1211	51100305A	B.H.M. Screw x 2
1212	54050300R	T.L. Washer OR x 2
1217	51480306A	B.H.M. Screw F x 2
1214	288627102	Holder
1215	51570305B	P.H. Tapt Screw x 2
1406	285110450	Retainer K
1410	51100310S	B.H.M. Screw x 2
1411	59030805P	Fiber Washer x 2
1606	285310650	Bearing K
1611	51640410D	Set Screw C.P.
1612	54040402N	Spring Washer
1613	53110403E	Hexagon Nut

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
7936	62031650W	Lug
7937	62031650W	Lug
8636	51100308S	B.H.M. Screw x 12
8637	53110303E	Hexagon Nut x 12
0516	53228059E	Nut x 2
0522	54050400R	T.L. Washer OR
0532	145525903	Bush
0533	145525903	Bush
0616	51100306S	B.H.M. Screw x 3
0620	51100304S	B.H.M. Screw x 2
0622	51100305S	B.H.M. Screw x 2
0625	281805501	Collar x 2
0631	51100312S	B.H.M. Screw x 2
0632	53110303E	Hexagon Nut x 2
RC05	RK0203030	Variable Resist., 20KΩ(B)
RC06	RK0203030	Variable Resist., 20KΩ(B)
R006	RC1022512	Resistor, 2.2MΩ ± 10%, ¼W
J005	YT0201006	Terminal, 1P
J006	YT0304001	Terminal, SPK
J007	YT0304001	Terminal, SPK
J008	YT0304001	Terminal, SPK
J009	YT0304001	Terminal, SPK
J010	YT0104004	Terminal, Ant.
J017	YJ0800012	Socket, Fuse Holder
J020	YT0101003	Terminal, Ground
J022	YL0102003	Terminal, 2P
S006	SS0802007	Slide Switch, Remote Control
L003	LB3007526	Balun Coil, FM
L004	LC1154002	Choke Coil, 150μH
W001	YC0240010	AC Cord
F001	FS1030006	Fuse, 3A
G001	BF1040001	Printed Compo.
L002	LF1120024	Ant. Coil, AM
L005	LC1332002	Choke Coil, 3.3μH
0602	257816052	Bracket K
0607	281927103	Holder
0609	51100310S	B.H.M. Screw x 2
0610	53110301E	Hexagon Nut x 2
0612	51100308S	B.H.M. Screw x 2
0613	53110301E	Hexagon Nut x 2
J014	YJ1100012	Jack, Remocon
0626	285116007	Bracket
0628	51100306S	B.H.M. Screw x 2
0629	53110303E	Hexagon Nut x 2
9136	62031650W	Lug
S004	SR0702001	Rotary Switch, BTL
PC01	YD2886014	P.W. Board
	ZZ2886014	P.W. Board Ass'y

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
RESISTORS		
All resistors are $\pm 5\%$ and $\frac{1}{4}W$.		
RC01	RT0512414	Resistor, 120K Ω
RC02	RT0512414	Resistor, 120K Ω
RC03	RT0510314	Resistor, 10K Ω
RC04	RT0510314	Resistor, 10K Ω
CAPACITORS		
CC01	DF1518205	Film, 0.0018 $\mu F \pm 5\%$, 50V
CC02	DF1518205	Film, 0.0018 $\mu F \pm 5\%$, 50V
MISCELLANEOUS		
SC01	SS0202017	Slide Switch, De-Emphasis
JC01 ? JC12	YP1000113	Plug
H007	HD2000510	Diode, 5B-2
C005	DK1810351	Ceramic Cap., 0.01 $\mu F +100\%$, -0%, 500V
9936	138200503	Clamper x 5
0911	285610701	Sheet
1710	288630201	Dial
W002	YW2886001	Wire Material
W003	YX2886101	Wire Material
W004	YW2886002	Wire Material
0411	275905701	Leg x 4
0412	51490410S	B.H.M. Screw FS x 4
0327	951022101	Label, For CANADA
0513	51100308S	B.H.M. Screw x 8
0514	53110303E	Hexagon Nut x 8
1303	288610550	Chassis K
1312	288610103	Support x 4
1316	51100306S	B.H.M. Screw x 2
1317	59030805P	Fiber Washer x 2
1318	51100306S	B.H.M. Screw x 3
1319	51100306S	B.H.M. Screw x 2
1320	51100306S	B.H.M. Screw x 4
1322	51100306S	B.H.M. Screw x 2
1323	51100306S	B.H.M. Screw x 2
1324	51100306S	B.H.M. Screw x 6
1331	51570306B	P.H. Tapt Screw x 2
1332	51570306B	P.H. Tapt Screw x 8
1333	51570306B	P.H. Tapt Screw x 2
1334	51570306B	P.H. Tapt Screw x 10
1403	281900501	Clamper
1404	51570306B	P.H. Tapt Screw x 2
1409	51100305S	B.H.M. Screw x 2
1416	285310102	Support x 2
1417	54040402N	Spring Washer x 2
1419	51490512A	B.H.M. Screw FS x 4
1420	53110501A	Hexagon Nut x 4
1421	54020501A	Flat Washer P x 4
1424	281805601	Buffer
1429	51570305B	P.H. Tapt Screw x 2
1503	138200503	Clamper x 5
1504	59030805P	Fiber Washer x 2

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
1507	54050300R	T.L. Washer OR x 6
1509	62031650W	Lug x 6
1511	51570306B	P.H. Tapt Screw x 10
1513	51570306B	P.H. Tapt Screw x 10
1515	285416005	Bracket
1516	51570305B	P.H. Tapt Screw x 2
1519	288612004	Insulator
1520	51570305B	P.H. Tapt Screw x 2
1528	285110101	Support, For CANADA x 2
1529	53110303E	Hexagon Nut, For CANADA x 2
1530	54040302N	Spring Washer, For CANADA x 2
1531	51100306S	B.H.M. Screw, For CANADA x 2
C003	EC4780551	Electroly Cap., 4700 $\mu F +100\%$, -10%, 55V
L001	TS6050206	Power Transformer
J021	YL0103018	Terminal, 3P Lug
0121	288606450	Case K, For CANADA
0204	285605601	Buffer x 4
0202	285325701	Lid
0203	257711803	Spacer x 4
0217	285015401	Knob x 3
0218	288615403	Knob x 8
0219	281815401	Knob x 2
0220	288615401	Knob x 4
0221	281815403	Knob x 5
0232	288615402	Knob
0302	288626501	Indicator
0303	288626502	Indicator, For CANADA
0309	51100306S	B.H.M. Screw x 2
0331	951091102	Label, Factory Code
0311	257886101	Label, UL Caution
0312	257886102	Label, Don't remove
0313	257886103	Label, See marking
0314	250626506	Indicator Do not use as handle
0319	282186101	Label, For CANADA
0320	282186102	Label, For CANADA
0323	951110102	Label
0402	51122608B	T.H.M. Screw x 4
0404	51100406S	B.H.M. Screw x 9, For CANADA x 7
0406	51480406S	B.H.M. Screw F x 4
0416	52010420A	H Head Bolt, x 6, For CANADA
0417	54080400R	T.L. Washer RR, x 6, For CANADA
0421	289205502	Collar
0816	56382540G	Eyelet
1413	203912001	Insulator
1431	288610902	Bracket
1435	51100304S	B.H.M. Screw x 2
1702	286726901	Protector
1706	285326902	Protector
1716	51570305B	P.H. Tapt Screw x 2
1719	51100305S	B.H.M. Screw x 2
1911	288610901	Shield

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
1912	51100305S	B.H.M. Screw x 4
1913	51570305B	P.H. Tapt Screw x 3
1915	54050300R	T.L. Washer OR
1602	285011202	Shaft
1603	54040402N	Spring Washer
2002	288685101	Instructions
2009	288685601	Schematic Diagram
2011	288685603	Schematic Diagram, For CANADA
2016	281885104	Instructions
2017	281885108	Instructions
2021	257785450	Guarantee Card K
2102	288680101	Packing Case, For CANADA
2103	288680102	Packing Case, For CANADA
2104	288680105	Packing Case
2105	288680106	Packing Case
2107	288680302	Partitioner
2108	288680303	Partitioner
2109	288680301	Partitioner x2, For CANADA
2112	901483838	Polyethylen Bag
2113	901484343	Polyethylen Bag, For CANADA
2114	901302501	Polyethylen Bag x 2
2117	102980401	Sleeve
2119	273182101	Silicagel x 2
2120	281905601	Buffer
2122	285125703	Lid
2123	285386101	Label
2124	51216059E	Screw x 4
2131	ZA0200007	Ext. Antenna
2202	952281501	Serial NO. Card x 4
2203	952301512	Serial NO. Card x 4, For CANADA

TECHNICAL SPECIFICATIONS

FM SECTION

Tuning Frequency Range.....	88 – 108MHz
IHF M Usable Sensitivity	3.5 μ V at 30dB
	50 μ V at 70dB
IHF Selectivity.....	48dB
Capture Ratio	3.0dB
Image Rejection Ratio at 106MHz.....	50dB
Total Harmonic Distortion (Mono)	0.6%
Total Harmonic Distortion (Stereo).....	0.8%
Frequency Response (ref. 75 μ sec. de-emphasis).....	\pm 2dB, from 30Hz to 15KHz
Stereo Separation at 1KHz	40dB, 26dB at 10KHz
Quadradial Output (400Hz 75KHz dev.)	300mV, 15Kohms

AM SECTION

Tuning Frequency Range.....	540 to 1605KHz
Usable Sensitivity.....	25 μ V
Selectivity	1000KHz, 25dB
Image Rejection Ratio at 1400KHz	45dB
Bandwidth (–6 dB)	7KHz

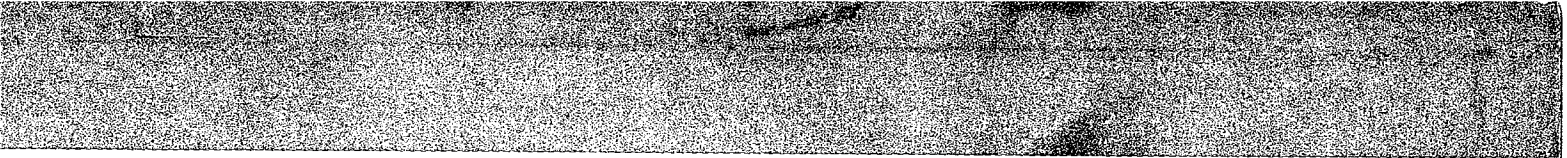
AUDIO SECTION

Input Sensitivity and Impedance – Phono	2.2mV, 47Kohms
– High level.....	150mV
Phono Frequency Response.....	30 to 15KHz, \pm 1dB (RIAA)
Intermodulation Distortion below rated power output (SMPTE)	Less than 0.9%
	Nominal 0.5%
Damping Factor	2 channel: 20 at 20Hz
	4 channel: 40 at 20Hz
Rated Continuous (RMS) Output	60W at 8ohms (30W x 2)
all channels operating simultaneously at 40Hz	48W at 8ohms (12W x 4)
to 20KHz for nominal harmonic distortion	

GENERAL

Power Requirements	120V
Power Consumption— at rated power output	230Watts
– idling (no signal)	33Watts
Dimensions – Panel Width	17 21/64 Inches
– Panel Height	5 25/64 Inches
– Depth	14 3/8 Inches
– Width (Packed for Shipment).....	22 1/4 Inches
– Height (Packed for Shipment).....	10 1/2 Inches
– Depth (Packed for Shipment).....	19 1/2 Inches
Weight – Unit alone	31.3 lbs
– Packed for Shipment	40.1 lbs

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





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