

SERVICE MANUAL

marantz

model 2235

Stereophonic Receiver

TABLE OF CONTENTS

SECTION	PAGE
Introduction	1
P.W. Board	1
Test Equipment Required for Servicing	2
AM Alignment Procedures	2
FM Alignment Procedures	3
Stereo Separation Alignment Procedures	3
Muting Circuit Alignment Procedures	3
Dolby FM Tape Output Setting	4
Audio Adjustment	4
Automatic Voltage Regulator Adjustment	4
Parts List	25~36
Technical Specifications	37
Servicing Information for European Model	39~45

LIST OF ILLUSTRATIONS

FIGURE	PAGE
1. Dial Stringing	1
2. Front Panel Adjustment and Component Locations	5
3. Main Chassis Component Locations (Top View)	5
4. Rear Panel Jacks and Component Locations	6
5. Main Chassis Component Locations (Bottom View)	6
6. P100 Circuit Diagram	7
7. FM Front End Board – P100 Component Assembly Diagram	7
8. P150 Circuit Diagram	8
9. AM Tuner Board – P150 Component Assembly Diagram	8
10. P200 Circuit Diagram	9
11. FM IF and Detector Board – P200 Component Assembly Diagram	9
12. P300 Circuit Diagram	10
13. FM Multiplex and Muting Board – P300 Component Assembly Diagram	10
14. PC01 Circuit Diagram	10
15. Dolby Level Board – PC01 Component Assembly Diagram	10
16. PU01 Circuit Diagram	11
17. Antenna Muting Board – PU01 Component Assembly Diagram	11
18. PY01 Circuit Diagram	11
19. Function Lamp Board – PY01 Component Assembly Diagram	11
20. PZ01 Circuit Diagram	11
21. Dial Lamp Board – PZ01 Component Assembly Diagram	11
22. PH01 Circuit Diagram	12
23. Dolby FM, Monitor, Mono and Hi Filter Switch Board – PH01 Component Assembly Diagram	12
24. PT01 Circuit Diagram	12
25. Loudness, FM Muting, Main and Remote Speaker Switch Board – PT01 Component Assembly Diagram	12
26. P400 Circuit Diagram	12
27. Phono Amplifier Board – P400 Component Assembly Diagram	12
28. PE01 Circuit Diagram	13
29. Pre and Tone Amplifier Board – PE01 Component Assembly Diagram	13
30. P700 Circuit Diagram	14
31. Main Amplifier Board – P700 Component Assembly Diagram	14
32. P800 Circuit Diagram	15
33. Power Supply Board – P800 Component Assembly Diagram	15
34. Exploded Mechanical Diagram	16~17
35. Schematic Diagram	18~19
36. Circuit Diagram	20~21
37. Block Diagram	22~23
38. Packing	24
39. PR01 Circuit Diagram	39
40. Fuse Board – PR01 Component Assembly Diagram	39
41. Rear Panel Jacks and Component Locations	40
42. Main Chassis Component Locations (Bottom View)	40
43. Voltage Conversion Chart	41
44. Circuit Diagram	42~43

TABLE	PAGE
1. Test Equipment Required for Servicing	2

INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model 2235 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 furnishes 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. P.W. BOARD

As can be seen from the circuit diagram, the chassis of Model 2235 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 Front End | ..... | mounted on P.W. Board, P100 |
| 2. AM Tuner | ..... | mounted on P.W. Board, P150 |
| 3. FM IF Amplifier | ..... | mounted on P.W. Board, P200 |
| 4. MPX Stereo Decorder | ..... | mounted on P.W. Board, P300 |
| 5. Dolby Level | ..... | mounted on P.W. Board, PC01 |
| 6. Antenna Muting | ..... | mounted on P.W. Board, PU01 |
| 7. Function Lamp | ..... | mounted on P.W. Board, PY01 |
| 8. Dial Lamp | ..... | mounted on P.W. Board, PZ01 |
| 9. Dolby FM, Monitor, Mono and Hi Filter Switch | ..... | mounted on P.W. Board PH01 |
| 10. Loudness, FM Muting, Main and Remote Speaker Switch | ..... | mounted on P.W. Board, PT01 |
| 11. Phono Amplifier | ..... | mounted on P.W. Board, P400 |
| 12. Pre and Tone Amplifier | ..... | mounted on P.W. Board, PE01 |
| 13. Main Amplifier | ..... | mounted on P.W. Board, P700 |
| 14. Power Supply | ..... | mounted on P.W. Board, P800 |

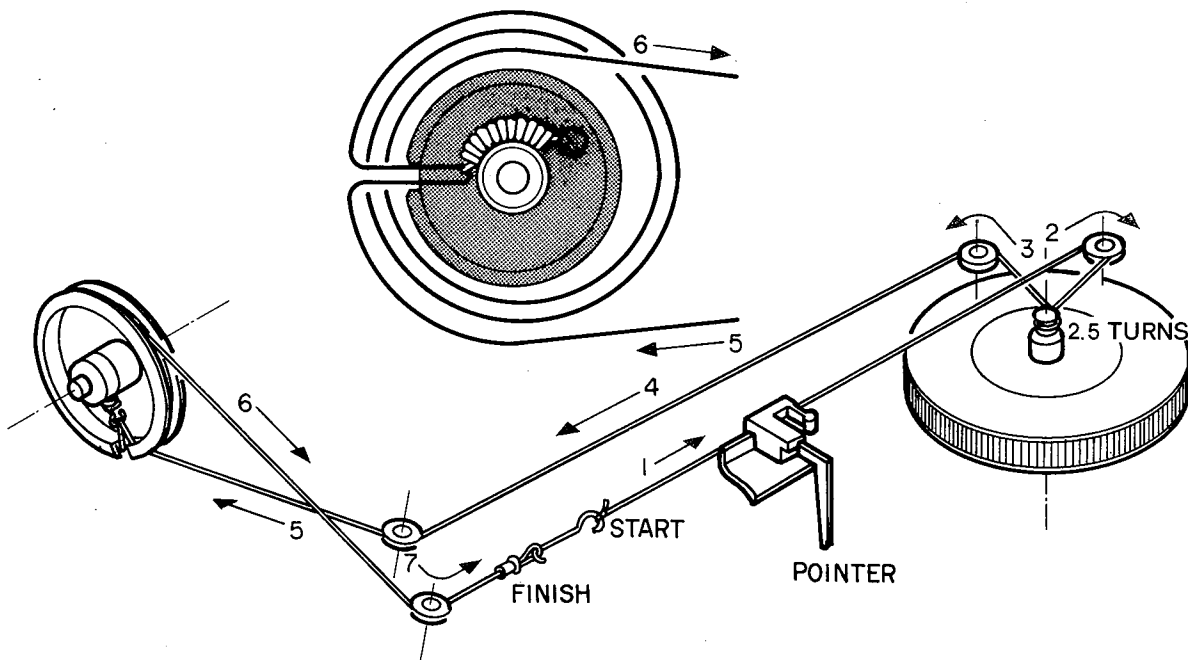


Figure 1. Dial Stringing

2. TEST EQUIPMENT REQUIRED FOR SERVICING

Table 1 lists the test equipment required for servicing the Model 2235 Receiver.

Table 1. Test Equipment Required for Servicing

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.
Frequency Counter		MPX Oscillator adjustment (VCO).
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 380	Monitors primary power to Amplifier.
AC Ammeter	Commercial Grade (1-10A)	Monitors amplifier output under short circuit condition.
Line Voltmeter	Commercial Grade (0-150V AC)	Monitors voltage of primary power to amplifier.
Variable Autotransformer (0-140V AC, 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, $\pm 1\%$ 100W)	Commercial Grade	Provides 8-ohm load for amplifier output termination.
Output Load (4 ohms, $\pm 1\%$ 100W)	Commercial Grade	Provides 4-ohm load for amplifier output termination.

3. AM ALIGNMENT PROCEDURES

3.1 AM IF Alignment

1. Connect a sweep generator to the J153 and an alignment scope to the test point R167 (outside).
2. Rotate each core of IF transformer L153 for maximum height and flat top symmetrical response.

3.2 AM Frequency Range and Tracking Alignment

1. Set AM signal generator to 515kHz. Turn the tuning capacitor fully closed (place the tuning pointer at the low end) and adjust the oscillator coil L152 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 for maximum audio output.

3. Repeat the steps 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 and RF coil L151 for maximum output.
5. Set the generator to 1400kHz and tune the receiver to the same frequency and adjust both trimming capacitors of antenna and RF tuned circuit for maximum output.
6. Repeat the steps 4 and 5 until no further adjustment is necessary.

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

3.3 AM Signal Strength Meter Adjustment

Set the AM Signal generator to 1000kHz with $5K\mu V$, and adjust R178 so that the signal strength meter may read 80% of the full scale.

4. FM ALIGNMENT PROCEDURES

1. Connect an FM signal generator to the FM ANTENNA terminals and an oscilloscope and an audio distortion analyzer to the TAPE 1 MONITOR OUT jacks on the rear panel.
2. Set the FM SG to 87MHz and provide about 3 to $5\mu V$. Place the tuning pointer at the low frequency end by rotating the tuning knob and adjust the core of oscillator coil L104 to obtain maximum audio output.
3. Set the FM SG to 109MHz and provide about 3 to $5\mu V$ output. Rotate the tuning knob and place the tuning pointer at the high frequency end and adjust the trimming capacitor C106 for maximum output.
4. Repeat the steps 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 coils L102 and L103 and IF transformer L106 for minimum audio distortion.
6. Set the FM SG to 106 MHz and tune the receiver to the same frequency. Adjust the trimming capacitor C102, C104 and C105 for minimum distortion.
7. Repeat the steps 5 and 6 until no further adjustment is necessary.
8. Adjust the secondary core (upper) of discriminator transformer L201 so that the center tuning meter pointer indicates its center at no signal applied. Set the FM SG to 98MHz and increase its output level to $1K\mu V$ and tune the receiver to the same frequency so that the center tuning meter pointer indicates its center. Adjust the primary core (lower) of L201 for minimum distortion.
9. Set the FM SG to 98MHz with $100K\mu V$, and adjust R374 so that signal strength meter may read 90% of the full scale.

5. STEREO SEPARATION ALIGNMENT PROCEDURES

1. Set the FM SG to provide $1K\mu V$ at 98MHz. Tune the receiver to the same frequency so that the center tuning meter pointer indicates its center.
2. Turn the FM SG modulation off (with the pilot signal turned off), connect a frequency counter to the test point J310, and adjust R311 so that the frequency counter may precisely read 19kHz.
3. Modulate the FM SG with stereo composite signal consisting of only subchannel signal (of course a pilot signal must be included).
4. Adjust the trimming resistor R301 for maximum and same separation in both channels.

6. MUTING CIRCUIT ALIGNMENT PROCEDURES

1. Connect a VTVM to across the resistor R363 and adjust the resistor R363 until the meter reads 0.75V DC at no signal.

2. Set the FM SG to provide $1\text{K}\mu\text{V}$ at 98MHz and tune the receiver to the same frequency correctly.
3. Turn on MUTING pushswitch. Shift the FM signal generator frequency to plus and minus and note both plus and minus shifted frequencies at which undesirable audio side responses are muted out. Adjust the R363 so that the same shifted frequencies mute the undesirable side response.
4. Adjust R362 for proper frequency shift at which the muting circuit operates.

7. DOLBY FM TAPE OUTPUT SETTING

1. Set the modulation of FM SG to 400Hz, 50% ($\pm 37.5\text{kHz}$ Dev.).
2. Set the FM SG to provide $1\text{K}\mu\text{V}$ at 98MHz. Tune the receiver to the same frequency so that the center tuning meter pointer indicates its center.
3. Turn on DOLBY FM pushswitch. Set the semifixed resistors RC01 and RC02 so that each output of the TAPE OUT jacks R and L become 580mV at VTVM.

8. AUDIO ADJUSTMENT

8.1 Main Amplifier DC Offset Alignment

Connect a DC voltmeter with 0.5 or 1V range between the SPEAKER terminals and adjust the trimming resistor R713 for "zero" DC output on the meter.

Repeat the same procedure for the other channel.

Note: During this alignment no load should be connected to the SPEAKER terminals.

8.2 Idle-Current Adjustment

Connect a VTVM between pins J713 and J717. Next, adjust the trimming resistor R766 for the VTVM reads 8mV DC.

Repeat the same procedure for the other channel.

Note: During this alignment no load should be connected to the speaker terminals.

8.3 Main Amplifier DC Offset Re-Alignment

Check the DC offset voltage aligned in the section 8.2 and if any DC output is observed on the DC voltmeter, adjust R713 again for "zero" output.

9. AUTOMATIC VOLTAGE REGULATOR ADJUSTMENT

Connect a VTVM to J804 (+) and J805 (-) and adjust R806 until the VTVM reads 35V under no signal condition.

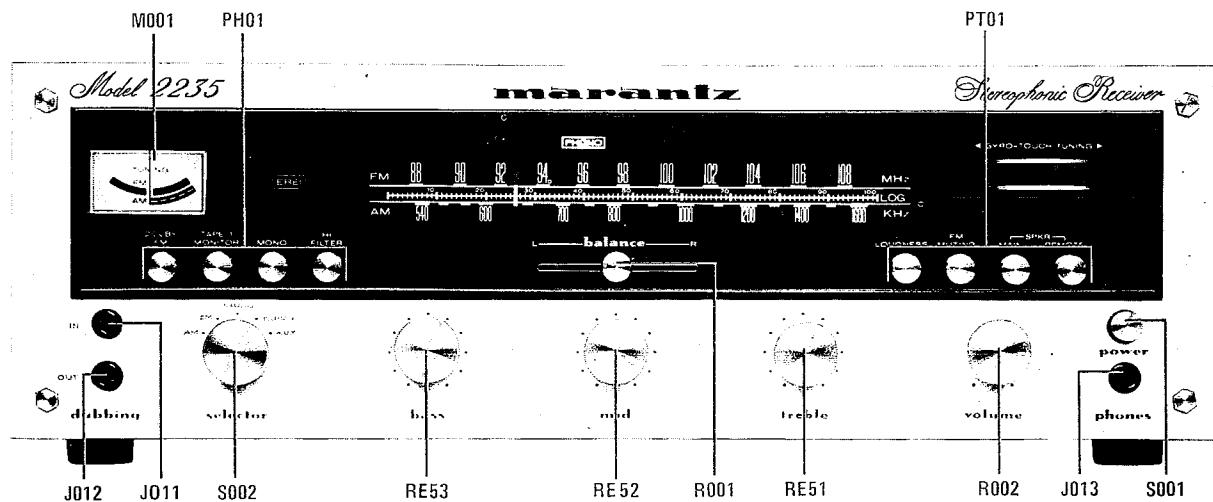


Figure 2. Front Panel Adjustment and Component Locations

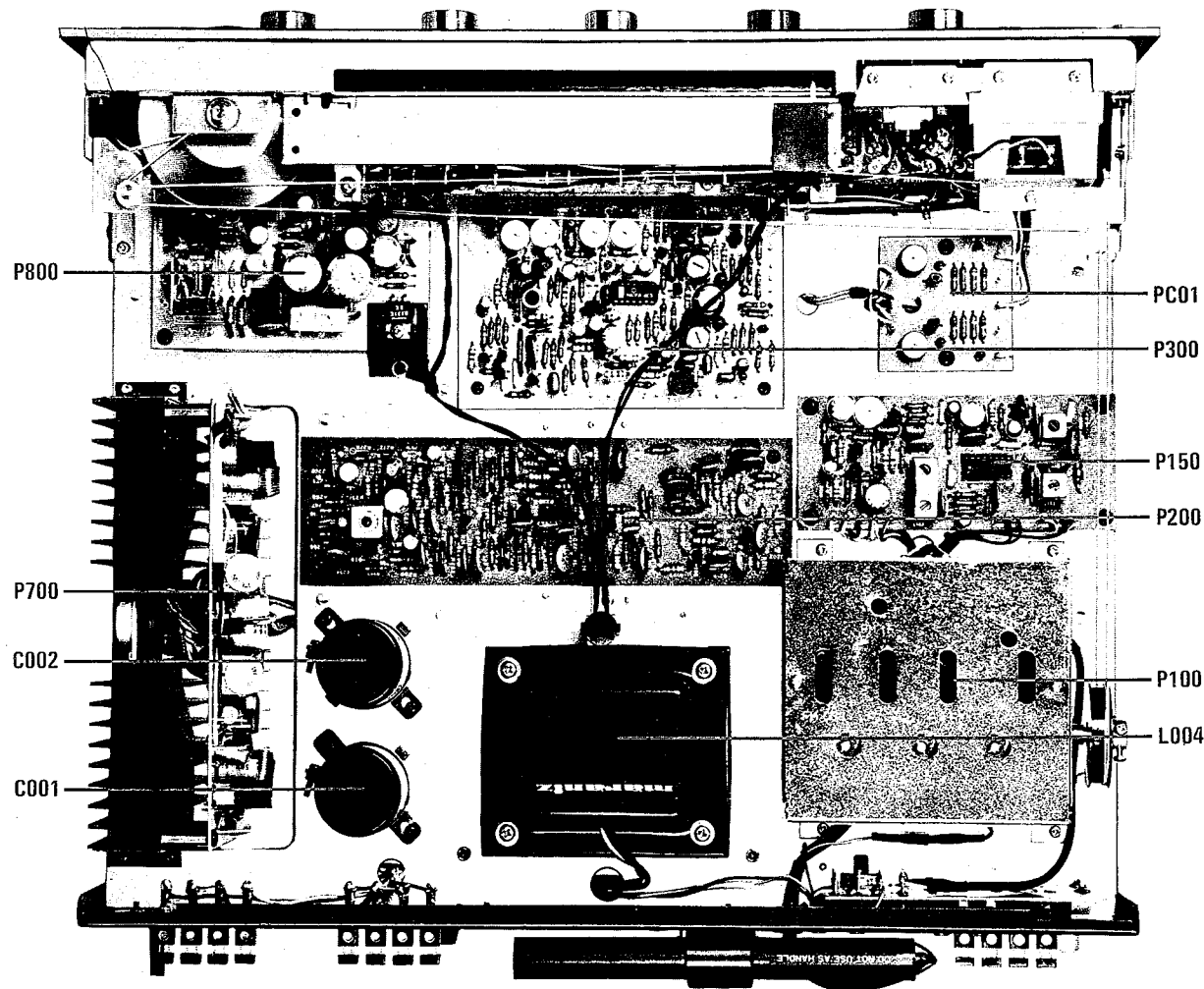


Figure 3. Main Chassis Component Locations (Top View)

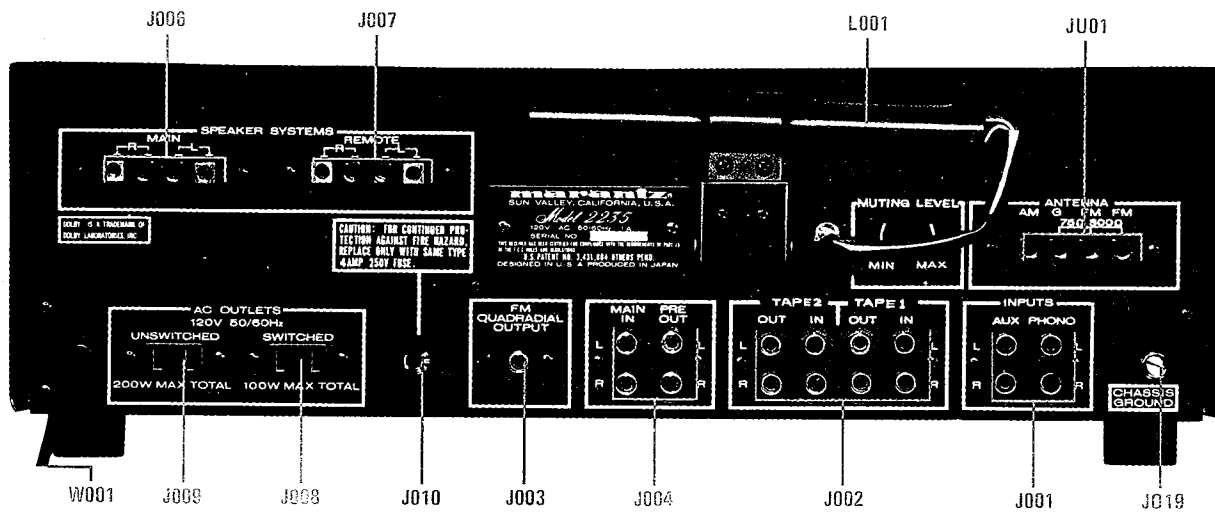


Figure 4. Rear Panel Jacks and Component Locations

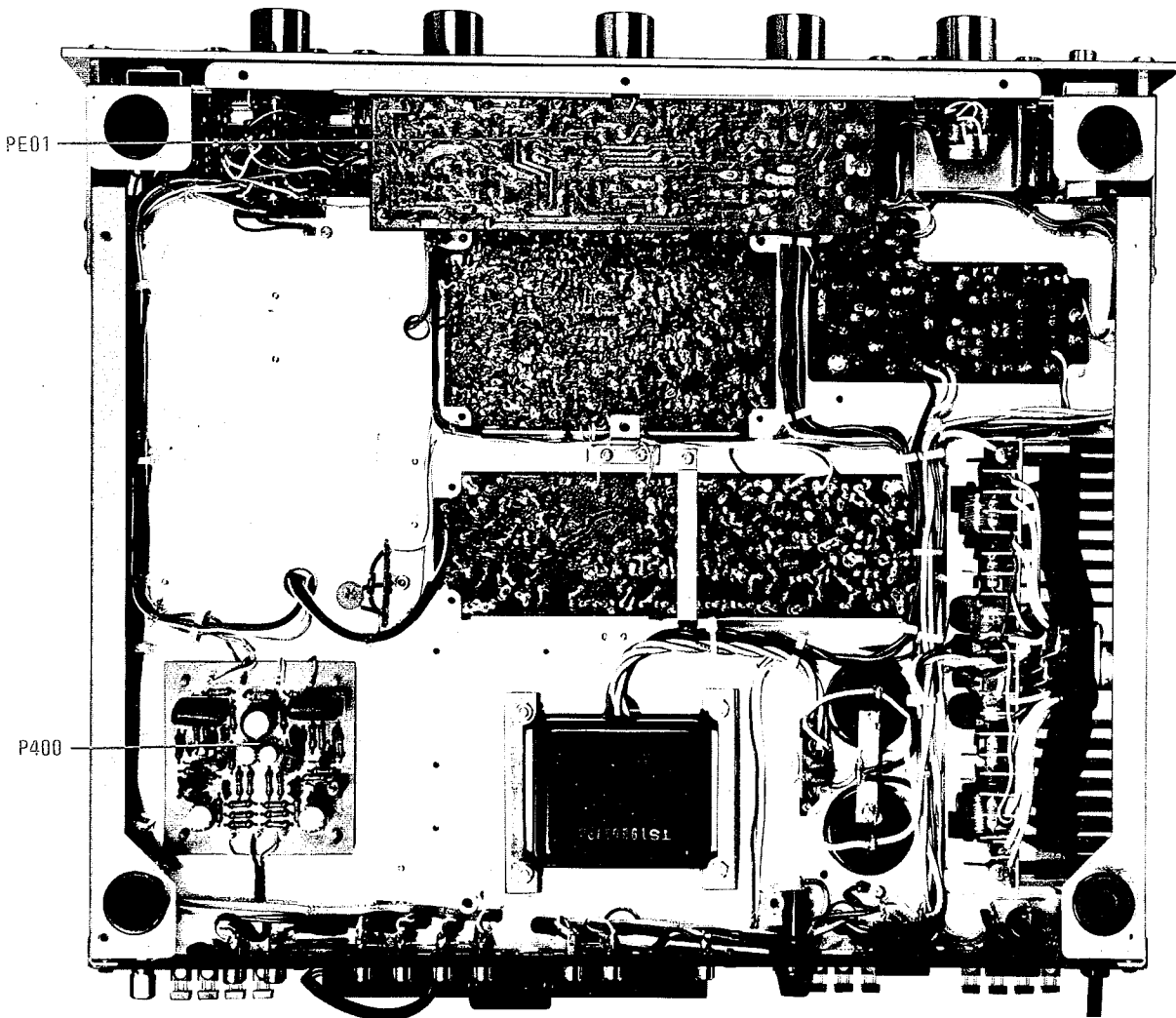


Figure 5. Main Chassis Component Locations (Bottom View)

