

**SERVICE
MANUAL** 112

marantz

model 112

Am/Fm Stereophonic Tuner

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1. INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model 112 Stereophonic Tuner.

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

The parts list furnishes information by which replacement parts may be ordered from the Marantz Company. A brief description is included for parts which can be usually be obtained through local suppliers.

2. AM TUNER

The AM Tuner section of the Model 112 is contained in the AM/IF circuit package consisting of one IC H202 (AN217) and three transistors. The IC is shown in Figure 1 in the block diagram form. The respective three transistors serve as RF amplifier, IF amplifier for intensifying the gain of the IC, and audio amplifier for magnifying the detected audio signal.

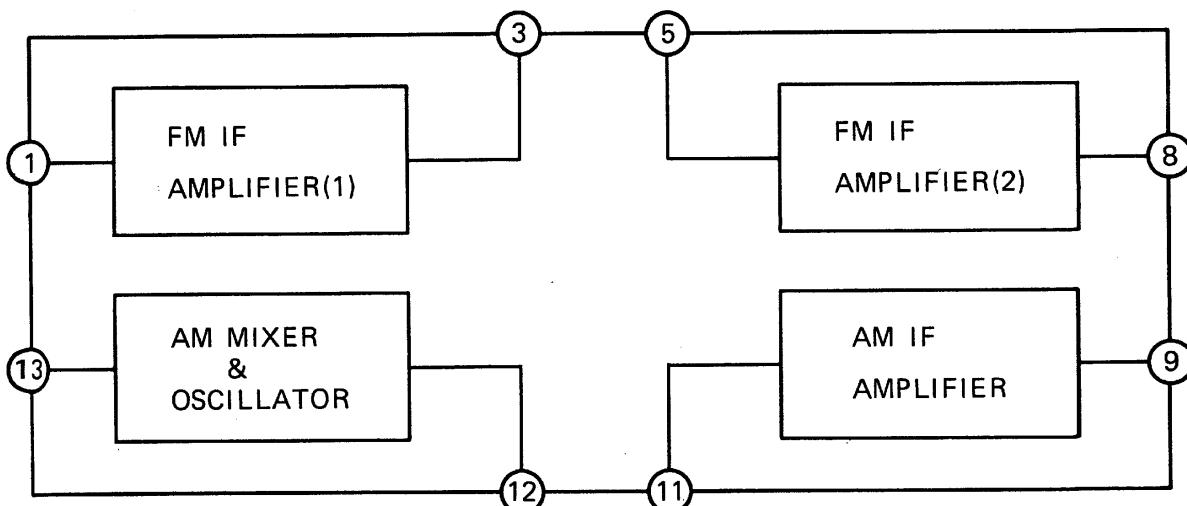


Figure 1. Block Diagram of the AN217

The IC includes an FM IF section and AM Tuner section, each of which comprises two functional blocks. The first block of the FM IF section is an FM IF amplifier (1), the input of which is fed from pin ①, and the output is led to pin ③. The second block is an FM IF amplifier (2), the input of which is fed from pin ⑤ and the output is led to pin ⑧.

The first block of the AM Tuner, on the other hand, is an AM mixer and oscillator, the input of which is fed from pin ⑬ and the output is led to pin ⑫. The second block is an AM IF amplifier, the input of which is fed from pin ⑪ and the output is led to the pin ⑨.

All components except the tuning capacitor and ferrite bar antenna are mounted on the printed circuit board P200.

An AM signal induced in the ferrite bar antenna is led to the base of the RF amplifier transistor (H209) and amplified to a level required for overcoming the conversion noises, thus giving good S/N performance. The tuned circuit inserted in each of the output and input circuits of the RF amplifier assures very high image and spurious rejection performance. Then, the amplified and selected AM signal is fed to one input (pin ⑬) of the Mixer section of the IC(H202) (pin ⑬). While the local oscillator voltage is injected to the other input (pin ⑭) of the section through the capacitor C244. Then, both AM signal and local oscillator signal are mixed and converted into 455kHz intermediate-frequency signal. The resulting IF signal is led to the first IF transformer L205 consisting of one ceramic filter and two tuned circuits.

The output of L205 is led to the additional IF amplifier (H210) for intensifying the AM IF gain. The output, in turn, is led through the coupling capacitor C253 to the input (pin ⑪) of the AM IF section in the IC(H202), where the output is amplified to a sufficient level to drive the detector. The fully amplified IF output derived from pin ⑨ is applied to the diode H228 to detect audible signal through the detector transformer L206. The detected audio signal is filtered and amplified, and the final audio output is obtained from the collector of H211 and applied to the output jacks through the function switch.

The DC component of the detected IF signal is used as an AGC voltage to control the emitter current of the IF amplifier H210 through the resistor R273 and R271, and then, the emitter voltage derived from transistor H210 controls the collector voltage of the RF amplifier H209.

A part of the IF signal output is also applied to the diode H229 through the capacitor C257 and is rectified to obtain DC current for energizing the AM signal strength meter M001.

2.1 Suggestions for Troubleshooting AM Tuner

Check for broken AM bar antenna, next try to tune a station by rotating the fly-wheel tuning knob slowly and observe the AM 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 L206. Next connect an oscilloscope to the test point Ⓐ or J218 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 1.5 or 3 volts, varying with tuning capacitor position. When measuring the oscillating voltage use an RF VTVM, no circuit tester gives correct indication. If the local oscillator voltage is normal, check all voltage distribution in the AM circuits by using a DC VTVM and compare the measured values with those given in the schematic diagram.

3. FM TUNER

The FM tuner section of the Model 112 consists of four functional blocks: FM Front End, IF Amplifier & Detector, Muting Control and MPX Stereo Decoding Circuit.

An FM signal induced by the FM antenna is led to the FM antenna coil L101 through the balun coil. The signal is then fed to the FET RF amplifier, which in turn feed its output to the next Mixer H102 through the double-tuned high-selective circuit. The Mixer converts its input signal into 10.7MHz intermediate-frequency signal and amplifies it at the same time. The H103 is a local oscillator and its output is injected into the base of the Mixer, the injection voltage is about 60mV. The 10.7MHz front end output is led to the next IF amplifier portion through the coaxial cable.

The IF section consists of five IF amplifier stages and one sub IF amplifier stage. The second and third stages of the five-stage IF amplifier, contained in the IC H202, serve as limiter. Three pieces of dual element ceramic filters are also used to obtain high selectivity, two IC limiter stages (H202) and a symmetrical diode limiter are also employed for the best limiting characteristics, improved capture ratio and good AM suppression.

A part of the IF amplifier H201 output is rectified by the diodes H220 and H221 and its DC output is fed back to the gate of the FET RF amplifier to decrease the gain with increase of the signal strength.

The IF signal sufficiently amplified through every IF amplifier stage is finally fed to the detector amplifier. The detected audio output is led to: (a) the Quadradial Jack on the rear panel through the resistor R233 and (b) the MPX stereo decoding IC H215 through R289 and H212.

3.1 Audio Muting and Stereo Mode Auto-Selecting Circuit

The muting circuit consisting of all solid-state electrical switching is incorporated in the Model 112.

The DC voltage obtained by rectifying the sub IF output signal from the H205 is applied to the base of H206 and turns on it, if the sub IF output is greater than predetermined level (muting threshold level).

When the H206 is turned on, the H207 is turned off, allowing the emitter-collector resistance to be increased and the collector voltage to be raised to about 9V. The raised collector voltage increases the gate bias voltage and turns on the switching FET H212, decreasing the sourcedrain resistance to near zero ohm and allowing the audio signal applied to the source to flow to the decoding IC pin ② through the source-drain path.

When the input signal is lower than predetermined level, the DC output obtained is small and can not turn on the H206, thus H206 keeps its turn-off state. This makes H207 turn on, decreasing the collector voltage and turning H212 off. Thus no audio signals can pass through the FET.

The transistor H208 also turns off when the transistor H207 turns on, and makes the transistor H213 turn on, which is connected to pin ⑧ on the MPX decoding IC. Therefore, pin ⑧ is equivalently grounded, and the operation of the IC becomes monaural. This prevents misoperation of stereo due to undesirable noises during deviation of tuning.

3.2 MPX Stereo Decoding Circuit

The stereo composite signal from the FM Detector undergoes phase compensation by R289 and C255, is led through the muting switching FET H212 to the input terminal pin ② of the MPX stereo decoding IC H215 on PLL (Phase Locked Loop) basis, and is decoded into the left and right stereo signals, which become available at pins ④ and ⑤ respectively. These decoded left and right stereo audio signals are introduced through the low pass filter consisting of L207 to L210 and C273 to C282 for elimination of undesirable residual switching signal and through the de-emphasis network consisting of R308, R309, C283 and C284, into the npn-pnp direct coupled audio amplifier, where the signals are amplified to a required level for the output from J226 and J227. From these jacks, the audio signals are led through the function switch and FM Dolby level preset resistors RS03 and RS04 to the output terminals on the rear panel. Figure 2 presents an internal block diagram showing the functions of the PLL basis MPX stereo decoding IC HA1156.

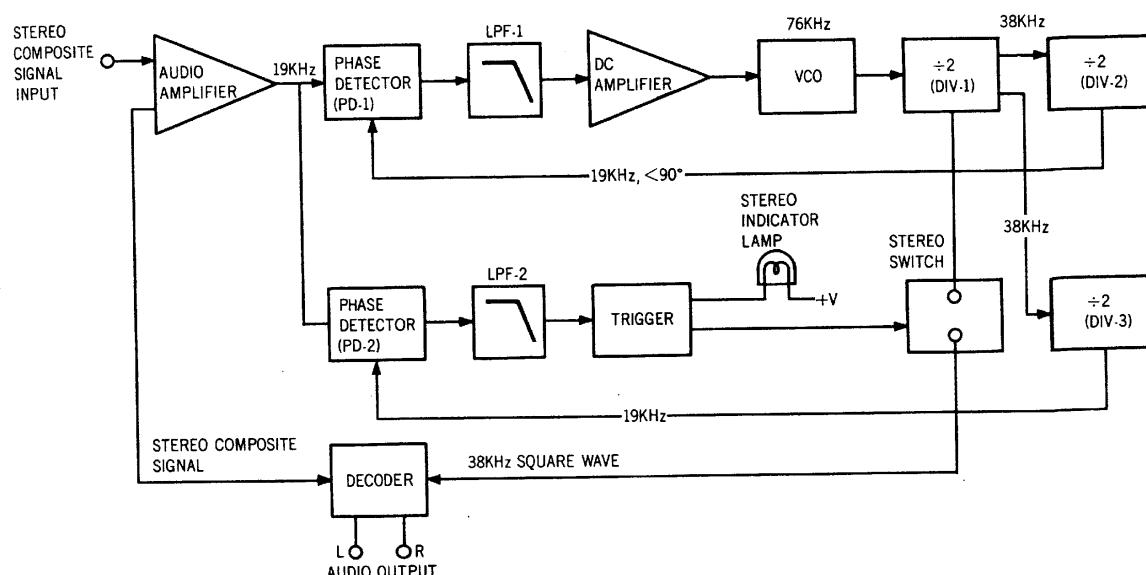


Figure 2. Block Diagram of the HA1156

The input stereo composite signal, amplified by the audio amplifier, is delivered to the phase detectors PD-1 and PD-2. A part of the stereo composite signal is also delivered to the stereo decoder section. The VCO (Voltage Control Oscillator) produces a free run oscillation in the neighborhood of 76kHz with the time constant determined by the capacitor C305 and resistors R311 and R312 set on the outside of pin ⑯. The VCO output has its frequency divided into 19kHz through the two frequency divider stages (DIV-1, DIV-2), and is reverted to the phase detector PD-1, which contains two input terminals designed to produce an output in proportion to the product of the two input signals. The signal led to PD-1 input one is a 19kHz square wave formed through frequency division of the 76kHz VCO output signal by the two frequency divider stages DIV-1 and DIV-2, and the 19kHz pilot signal included in the stereo composite signal as a reference signal is led to the other PD-1 input. Therefore, the output of the PD-1 which has passed through the low pass filter LPF-1 provides DC output voltage in proportion to the phase variance between the two inputs. This DC output voltage is amplified by the DC amplifier, and supplied to the 76kHz VCO as a control voltage. This means that the output frequency and phase of the VCO have been phase-locked to the input pilot signal. The 38kHz sub-carrier reproduced by the PLL as stated above is delivered through the stereo switch to the stereo decoder section as a switching signal, thus driving the decoder stage. One PD-2 input is given the 19kHz resulting from the frequency division completed by the DIV-1 and DIV-3, whereas the other input gets the 19kHz output contained in the composite signal, and the output is provided with a DC output in proportion to the amplitude of the pilot signal. This DC output is furnished through the LPF-2 to the trigger amplifier which drives the stereo indicator lamp and stereo switch. Therefore, insufficient supply of the pilot signal results in failure to light the stereo indicator and to turn on the stereo switch located in the path of the 38kHz switching signal, thereby avoiding a wrong stereo operation. H213 attached on the outside of pin ⑧ is a switching transistor for automatic monaural-stereo switchover. When the intensity of an incoming signal from an FM station is weaker than a predetermined level, this H213 is turned on and pin ⑧ is grounded, thereby developing a condition for monaural reception. For a forced monaural operation, switch the MODE switch to "MONO", and H213 comes into an "On" condition with the positive bias voltage applied to the base, and pin ⑧ is grounded, thereby establishing monaural operation. The transistor H214 connected externally to pin ⑯ is intended to stop the 76kHz oscillation of the VCO which interferes an AM signal during the reception of an AM station. When the function switch is set to "AM" position, a positive bias is charged on the base of H214, H214 is turned on, and pin ⑯ is grounded. Thus, the oscillation of the VCO is stopped, ending the interference with AM reception.

3.3 Suggestion for Troubleshooting FM Tuner

3.3.1 Symptom: No FM Reception

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

3.3.2 Symptom: No Stereo Separation

First, check that the "MONO" switch is in normal out position. Connect an FM RF signal generator output modulated by a stereo modulator to the rear FM antenna terminals, and check whether the stereo beacon is turned on or not. If not turned on, check for 19kHz VCO output signal (test point ⑧, R304), using an oscilloscope and frequency counter.

4. AM ALIGNMENT PROCEDURES

4.1 AM IF Alignment

- (1) Connect a sweep generator to J206 and an alignment scope to the test point \textcircled{B} .
- (2) Rotate each core of the IF transformers L205 and L206 for maximum height and flat top symmetrical response.

4.2 AM Frequency Range and Tracking Alignment

- (1) Set an AM signal generator of 515kHz. Turn the tuning capacitor fully closed (place the tuning pointer at the low end.) and adjust the oscillator coil L204 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 Steps (1) and (2) until no further adjustment is necessary.
- (4) Set the generator to 600kHz and tune the tuner to the same frequency and adjust the slug core of the AM ferrite rod antenna and RF coil L203 for maximum output.
- (5) Set the generator to 1400kHz and tune the tuner to the same frequency and adjust both trimming capacitors of the antenna and RF tuned circuit for maximum output.
- (6) Repeat 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.

5. FM ALIGNMENT PROCEDURES

- (1) Connect an FM signal generator (FM SG) to the FM antenna terminals and an oscilloscope and audio distortion analyzer to the output jacks on the rear panel.
- (2) Set the FM SG to 87.0MHz and provide about 3 to $5\mu\text{V}$. Place the tuning pointer at the low frequency end by rotating the tuning knob and adjust the core of the oscillator coil L104 to obtain maximum audio output.
- (3) Set the FM SG to 108.5MHz and provide about 3 to $5\mu\text{V}$ output. Rotate the tuning knob and place the tuning pointer at the high frequency end and adjust the trimming capacitor C123 for maximum output.
- (4) Repeat Steps (2) and (3) until no further adjustment is necessary.
- (5) Set the FM SG to 90MHz and tune the tuner to the same frequency. Decrease signal generator output until the audio output level decreases with decrease of the generator output. Adjust the antenna coil L101, RF coils L102 and L103 and IF transformer L105 for minimum audio distortion.
- (6) Set the FM SG to 106MHz and tune the tuner to the same frequency. Adjust the trimming capacitors C101, C102 and C103 for minimum distortion.
- (7) Repeat Steps (5) and (6) until no further adjustment is necessary.
- (8) Adjust the secondary core (upper) of the 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 $1\text{K}\mu\text{V}$ and tune the tuner to the same frequency so that the center tuning meter pointer indicates its center. Adjust the primary core (lower) of L201 for minimum distortion.

5.1 Stereo Separation Alignment

- (1) Set an FM signal generator (FM SG) to provide $1\text{K}\mu\text{V}$ at 98 MHz. Tune the tuner to the same frequency so that the center tuning meter pointer indicates its center. Then turn off the modulation of the FM SG, connect a frequency counter to the test point R304 (point \textcircled{B}) and adjust R307 so that the frequency counter may precisely read 19kHz.
- (2) Modulate the FM SG with the stereo composite signal consisting of either L or R channel (of course, the pilot signal must be included).

(3) Adjust the trimming resistor R289 for maximum and same separation in both channels.

5.2 Muting Circuit Alignment

Set an FM signal generator (FM SG) output to provide $12.5\mu\text{V}$ (IHF) at 98MHz and tune the receiver to the same frequency.

Adjust the trimming resistor R246 for the threshold level of $12.5\mu\text{V}$ (during this adjustment turn the MUTING pushswitch "on").

5.3 FM Dolby Level Adjustment

(1) Modulate an FM signal generator to 40% with a 400Hz signal and set it to 98MHz at $1\text{K}\mu\text{V}$. Precisely tune the tuner to the same frequency.

(2) Depress the FM Dolby pushswitch in. Adjust RS03 and RS04 until the outputs of both channels may become 340mV.

6. TEST EQUIPMENT REQUIRED FOR SERVICING

Table 1 lists the test equipment required for servicing the Model 112 Tuner.

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 squarewaves signal source.
Oscilloscope	High sensitivity with DC horizontal and vertical amplifiers.	Waveform analysis and trouble shooting.
VTVM	With AC, DC, RF range.	Voltage measurements.
Circuit Tester		Trouble shooting.

Table 1. Test Equipment Required for Servicing

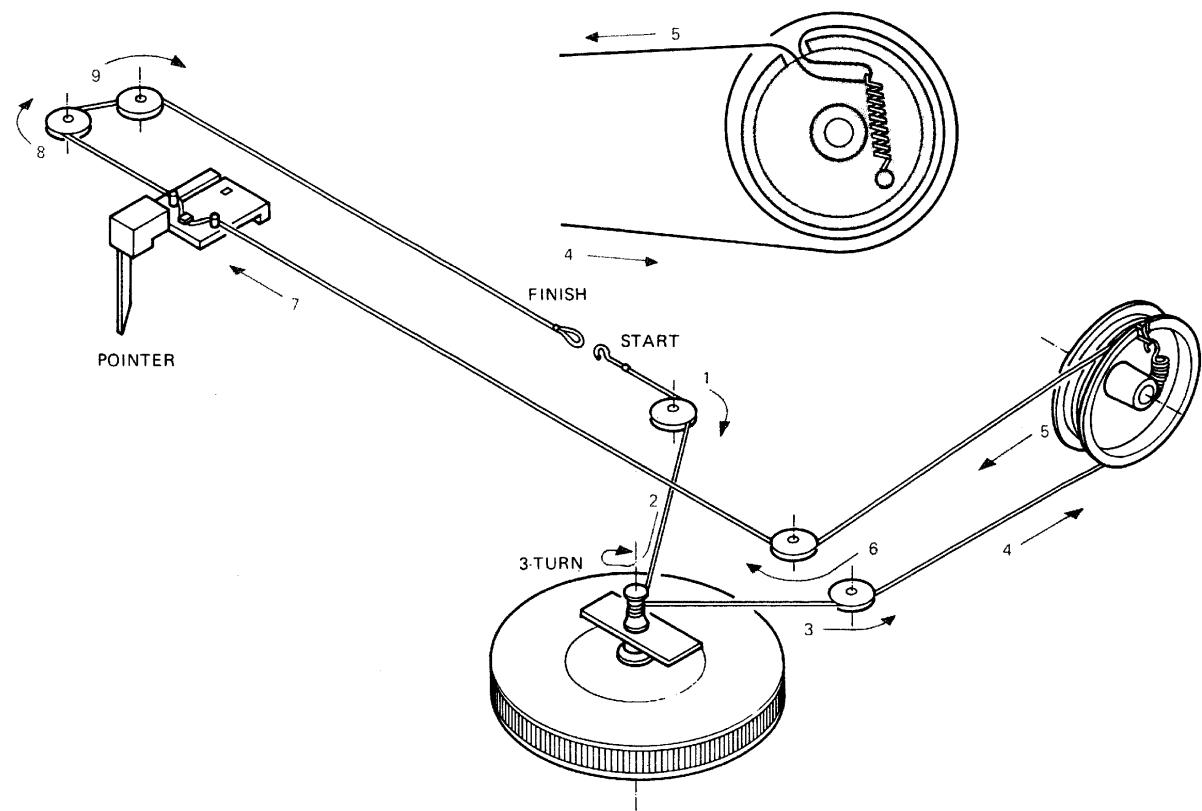


Figure 3. Dial Stringing

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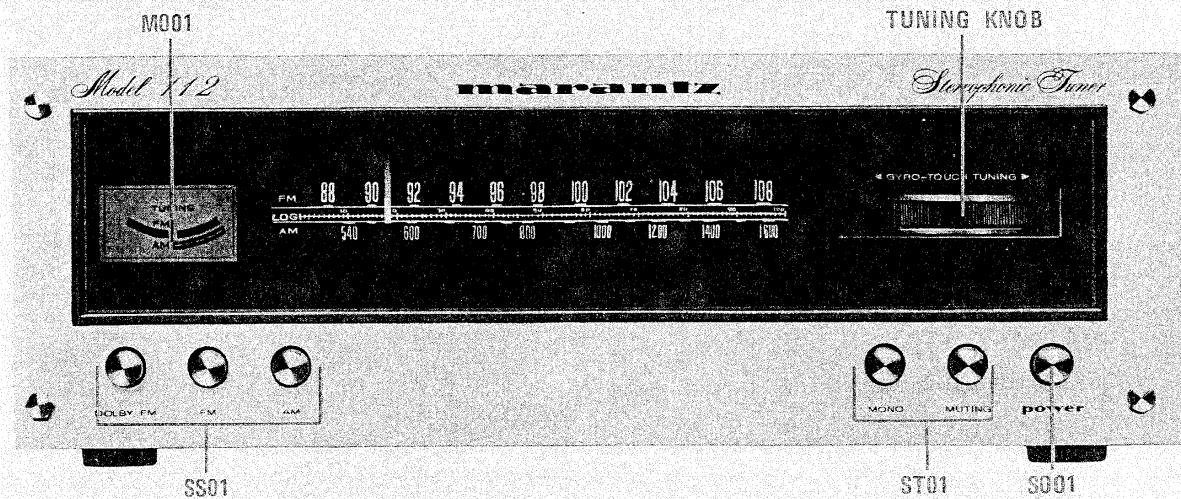


Figure 4. Front Panel Adjustment and Component Locations

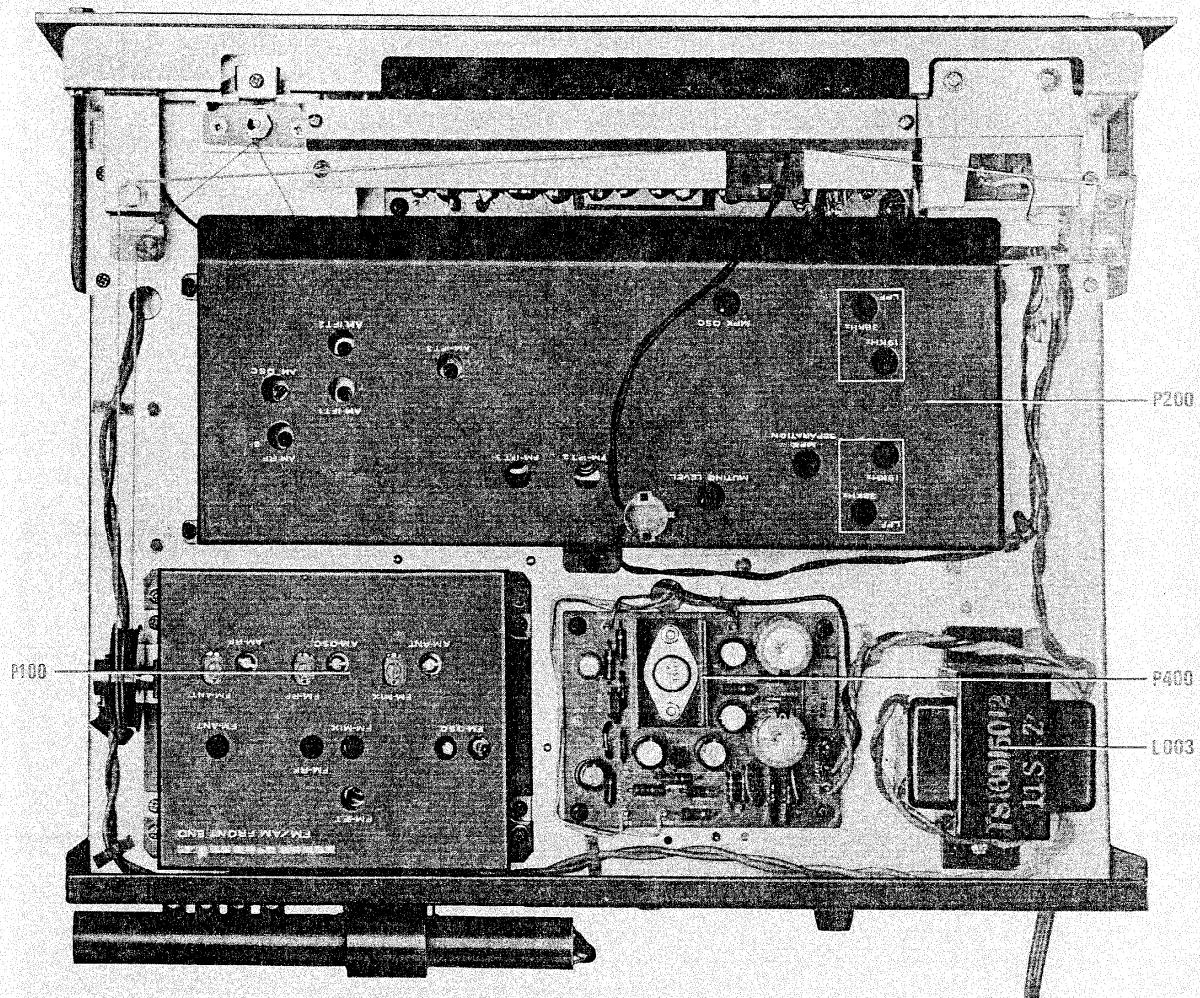


Figure 5. Main Chassis Component Locations (Top View)

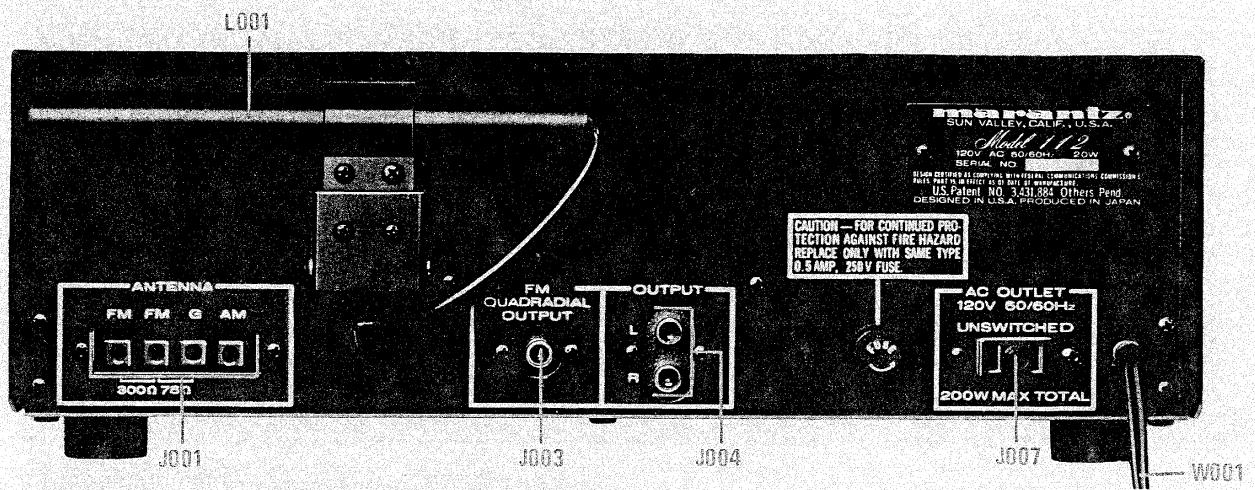


Figure 6. Rear Panel Adjustment and Component Locations

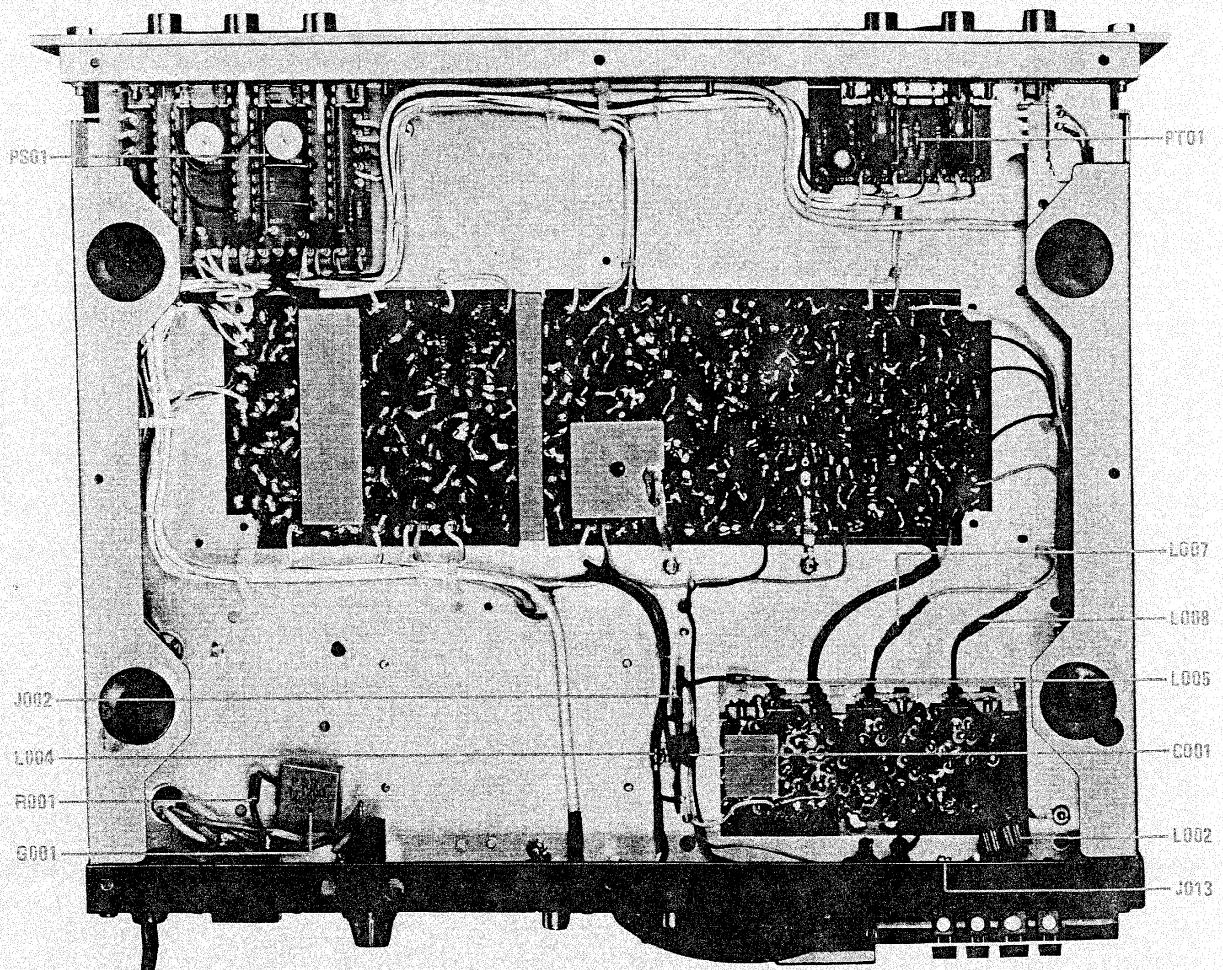


Figure 7. Main Chassis Component Locations (Bottom View)

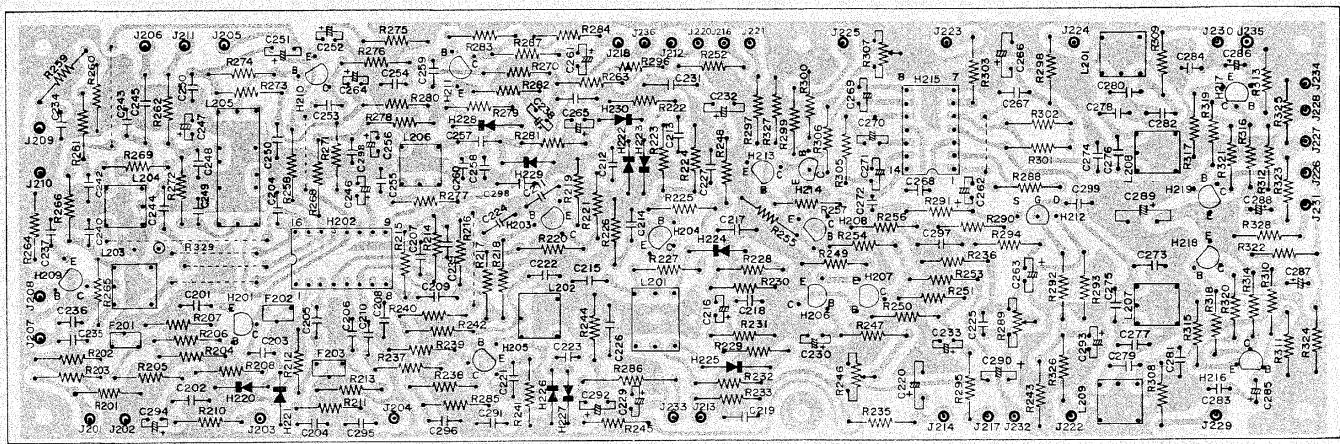


Figure 8. FM/AM Tuner Assembly P200 Component Locations

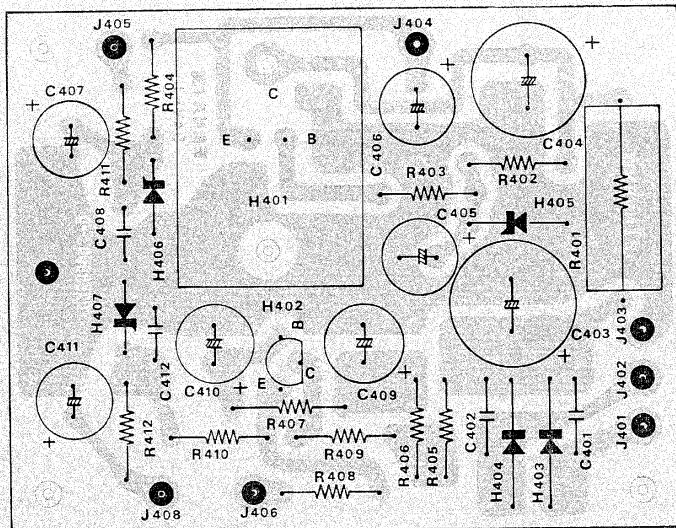


Figure 9. Power Supply Assembly P400 Component Locations

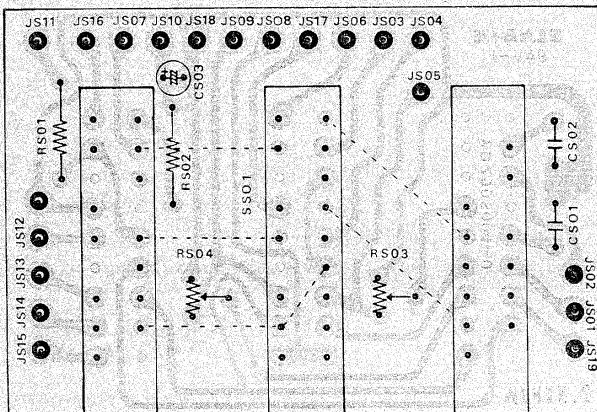
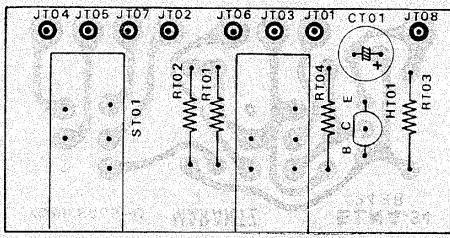


Figure 10. Selector Switch Assembly PS01 Component Locations



**Figure 11. Mode Switch Assembly PT01
Component Locations**

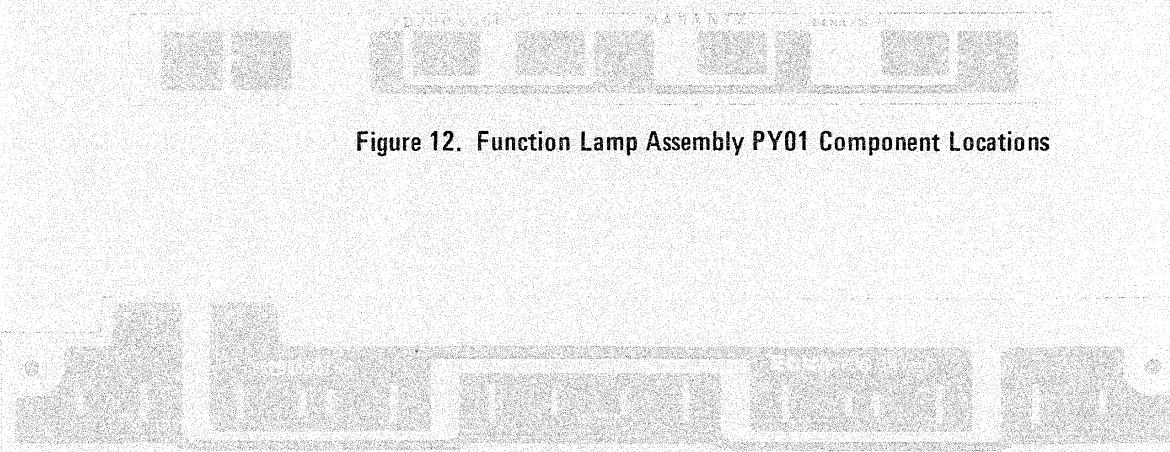
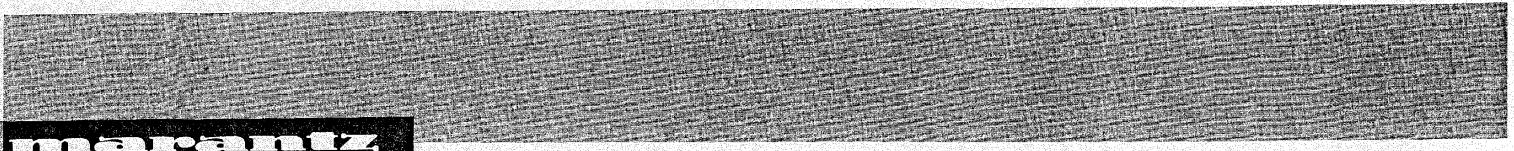


Figure 12. Function Lamp Assembly PY01 Component Locations



Figure 13. Dial Lamp Assembly PZ01 Component Locations



NOTE

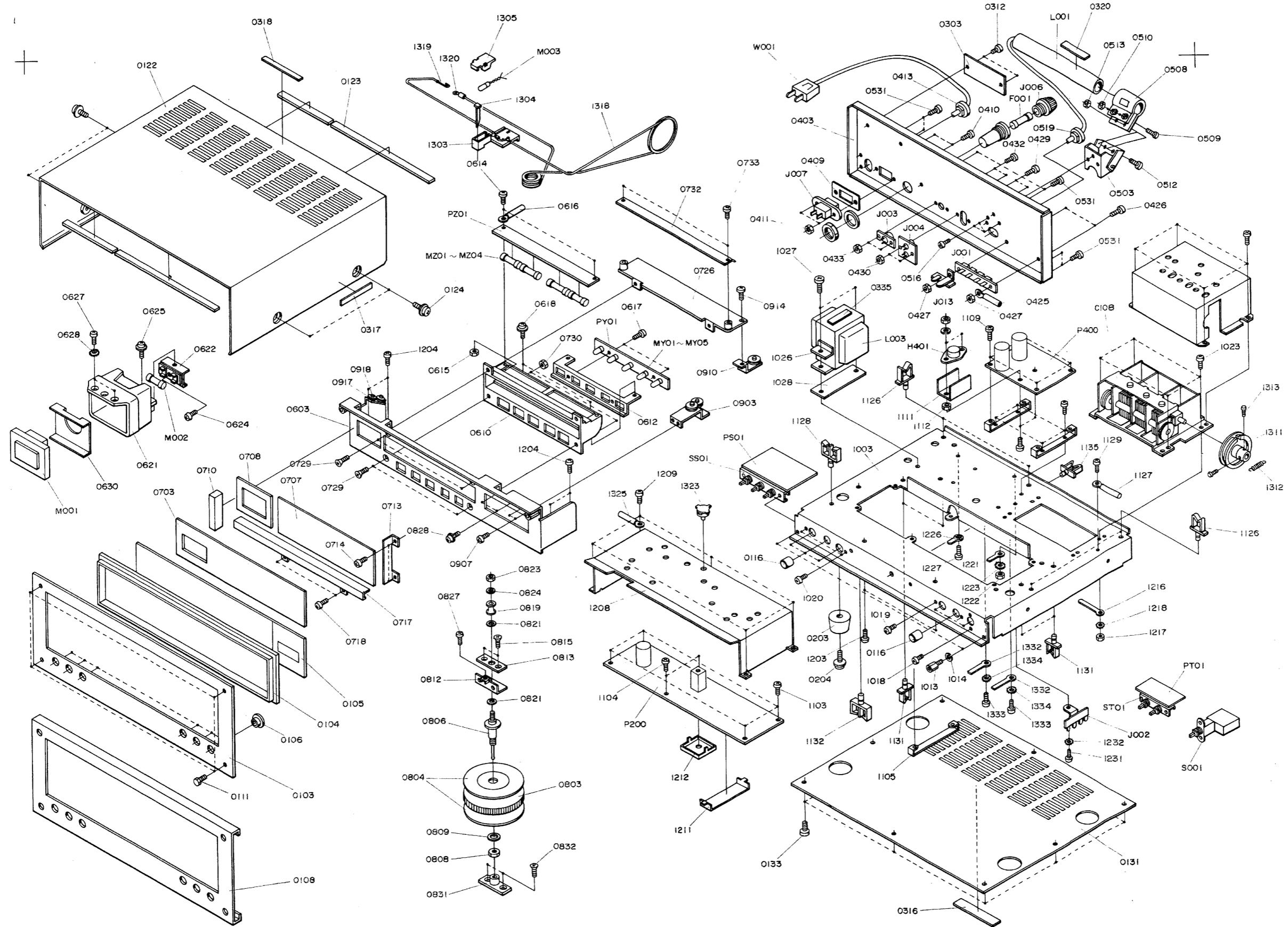


Figure 14. Exploded Mechanical Diagram

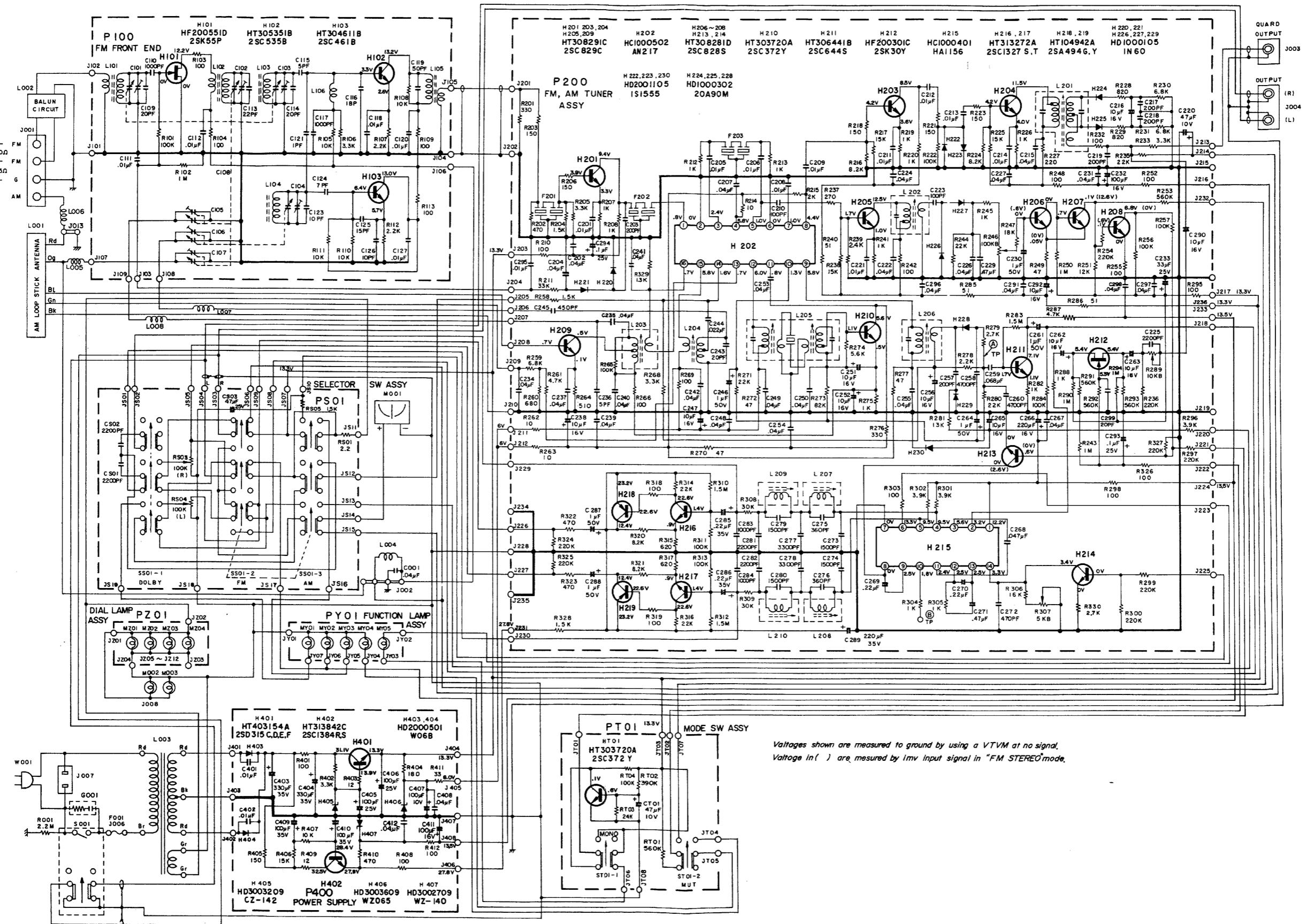


Figure 15. Schematic Diagram

7. PARTS LIST

REF. DESIG.	U	E	PART NO.	DESCRIPTION	REF. DESIG.	U	E	PART NO.	DESCRIPTION					
A 0103 0104 0105 0106 0108	1 1 1 6 1	1 1 1 6 1	290806340 290806301 291240101 290815801 288625901 290805301	Front Panel Assembly Escutcheon Frame Window Bush Cover	R214 R215 R216 R217 R218 R219 R220 R221	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	RT0510014 RT0520214 RT0582214 RT0515314 RT0515114 RT0510214 RT0510214 RT0515114	10Ω 2KΩ 8.2KΩ 15KΩ 150Ω 1KΩ 1KΩ 150Ω					
B 0122 0123	1 1 3	1 1 3	282725740 282725701 257711807	Lid Assembly, Top Lid Spacer	R222 R223 R224 R225 R226 R227 R228 R229 R230 R231	1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1	RT0510414 RT0515114 RT0582214 RT0515314 RT0510214 RT0522114 RT0582114 RT0582114 RT0568214 RT0568214	100KΩ 150Ω 8.2KΩ 15KΩ 1KΩ 220Ω 820Ω 820Ω 6.8KΩ 6.8KΩ					
C 0405 0416 0417	1 1 2	1 1 55060305S	290816040 290816022 282125901 T R Rivet	Rear Panel Assembly Bracket Bush T R Rivet	R232 R233 R235 R236 R237 R238 R239 R240 R241 R242	1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1	RT0510114 RT0533214 RT0522314 RT0522414 RT0527114 RT0515314 RT0582214 RT0551014 RT0510214 RT0510114	100Ω 3.3KΩ 22KΩ 220KΩ 270Ω 15KΩ 8.2KΩ 51Ω 1KΩ 100Ω					
D 1303 1304 1305 M003	1 1 1 1	1 1 1 IN1008030	290810340 290810301 290810302 290806701 IN1008030	Pointer Assembly Pointer Pointer Cap Lamp	R243 R244 R245 R246 R247 R248 R249	1 1 1 1 1 1 1	1 1 1 1 1 1 1	RT0510514 RT0522314 RT0510214 RA0104018 RT0518314 RT0510114 RT0547014	1MΩ 22KΩ 1KΩ Trimming, .100KΩ (B) 18KΩ 100 Ω 47Ω					
E 1311 1312 1313	1 1 2	1 1 2	282715942 282715901 71101569M 51064019A	Drum Assembly Drum Spring Screw	R250 R251 R252 R253 R254 R255 R256 R257 R258 R259	1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1	RT0510514 RT0512314 RT0510114 RT0556414 RT0522414 RT0510114 RT0510414 RT0510414 RT0515214 RT0568214	1MΩ 12KΩ 100Ω 560KΩ 220KΩ 100Ω 100KΩ 100KΩ 1.5KΩ 6.8KΩ					
F 1318 1319	1 1	1 1	120200640 72080802A 120225801	Hook Assembly String Hook	R260 R261 R262 R263 R264 R265 R266 R267 R268 R269	1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1	RT0568114 RT0547214 RT0510014 RT0510014 RT0551114 RT0510414 RT0510114 RT0510214 RT0533214 RT0510114	680Ω 4.7KΩ 10Ω 10Ω 510Ω 100KΩ 100Ω 1KΩ 33KΩ 100Ω					
G 0803 0804 0806 0808 0809	1 2 1 1 1	1 2 1 1 1	290827340 257727301 257706302 290811201 53110603E 54020601E	Fly Wheel Assembly Fly Wheel Escutcheon Shaft Hexagon Nut Flat Washer	FM/AM TUNER CIRCUIT BOARD-P200 P.W. Board, FM/AM Tuner (Print Only) P.W. Board Assembly P.W. Board Assembly				R270 R271 R272 R273 R274 R275		RT0547014 RT0522314 RT0547014 RT0582314 RT0556214 RT0510214		47Ω 22KΩ 47Ω 82KΩ 5.6KΩ 1KΩ	
P200	1 1 1	1 ZZ2908002 ZZ2908002	YD2908002 ZZ2908002 ZZ2908002	P200-RESISTORS All resistors are ±5% and 1/4W, unless otherwise indicated.										
R201 R202 R203 R204 R205 R206 R207 R208 R210 R211 R212 R213	1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1	RT0533114 RT0547114 RT0515114 RT0515214 RT0533214 RT0515114 RT0510214 RT0510214 RT0510114 RT0533314 RT0510214 RT0510214	330Ω 470Ω 150Ω 1.5KΩ 3.3KΩ 150Ω 1KΩ 1KΩ 100Ω 33KΩ 1KΩ 1KΩ										

REF. DESIG.	U	E	PART NO.	DESCRIPTION	REF. DESIG.	U	E	PART NO.	DESCRIPTION
R276	1	1	RT0533114	330Ω	H205	1	1	HT308291C	Transistor, 2SC829(C)
R277	1	1	RT0547014	47Ω	H206	1	1	HT308281D	Transistor, 2SC828(S)
R278	1	1	RT0522214	2.2KΩ	H207	1	1	HT308281D	Transistor, 2SC828(S)
R279	1	1	RT0527214	2.7KΩ	H208	1	1	HT308281D	Transistor, 2SC828(S)
R280	1	1	RT0522314	22KΩ	H209	1	1	HT308291C	Transistor, 2SC829(C)
R281	1	1	RT0513314	13KΩ	H210	1	1	HT303720A	Transistor, 2SC372(Y)
R282	1	1	RT0510214	1KΩ	H211	1	1	HT306441B	Transistor, 2SC644 (S)
R283	1	1	RT0515514	1.5MΩ	H212	1	1	HF200301C	FET, 2SK30 (Y)
R284	1	1	RT0510414	100KΩ	H213	1	1	HT308281D	Transistor, 2SC828 (S)
R285	1	1	RT0551014	51Ω	H214	1	1	HT308281D	Transistor, 2SC828 (S)
R286	1	1	RT0551014	51Ω	H215	1	1	HC1000401	IC, HA1156
R287	1	1	RT0547214	4.7KΩ	H216	1	1	HT313272A	Transistor, 2SC1327S or T
R288	1	1	RT0510214	1KΩ	H217	1	1	HT313272A	Transistor, 2SC1327S or T
R289	1	1	RA0103025	Trimming, 10KΩ (B)	H218	1	1	HT104942A	Transistor, 2SA494 G or Y
R290	1	1	RT0510514	1MΩ	H219	1	1	HT104942A	Transistor, 2SA494 G or Y
R291	1	1	RT0556414	560KΩ	H220	1	1	HD1000105	Diode, IN60
R292	1	1	RT0556414	560KΩ	H221	1	1	HD1000105	Diode, IN60
R293	1	1	RT0556414	560KΩ	H222	1	1	HD2001105	Diode, IS1555
R294	1	1	RT0510514	1MΩ	H223	1	1	HD2001105	Diode, IS1555
R295	1	1	RT0510114	100Ω	H224	1	1	HD1000302	Diode, 20A90M
R296	1	1	RT0539214	3.9KΩ	H225	1	1	HD1000302	Diode, 20A90M
R297	1	1	RT0522414	220KΩ	H226	1	1	HD1000105	Diode, IN60
R298	1	1	RT0510114	100Ω	H227	1	1	HD1000105	Diode, IN60
R299	1	1	RT0522414	220KΩ	H228	1	1	HD1000302	Diode, 20A90M
R300	1	1	RT0522414	220KΩ	H229	1	1	HD1000105	Diode, IN60
R301	1	1	RT0539214	3.9KΩ	H230	1	1	HD2001105	Diode, IS1555
R302	1	1	RT0539214	3.9KΩ	P200-CAPACITORS				
R303	1	1	RC1010112	100Ω ±10%, ½W	C201	1	1	DK1710301	Ceramic, 0.01μF ±20%
R304	1	1	RT0510214	1KΩ	C202	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%
R305	1	1	RT0510214	1KΩ	C203	1	1	DD1620101	Ceramic, 200PF ±10%SL
R306	1	1	RT0516314	16KΩ	C204	1	1	DK1710301	Ceramic, 0.01μF ±20%
R307	1	1	RA0502020	Trimming, 5KΩ (B)	C205	1	1	DK1710301	Ceramic, 0.01μF ±20%
R308	1	1	RT0530314	30KΩ	C206	1	1	DK1710301	Ceramic, 0.01μF ±20%
R309	1	1	RT0530314	30KΩ	C207	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%
R310	1	1	RT0515514	1.5MΩ	C208	1	1	DK1710301	Ceramic, 0.01μF ±20%
R311	1	1	RT0510414	100KΩ	C209	1	1	DK1710301	Ceramic, 0.01μF ±20%
R312	1	1	RT0515514	1.5MΩ	C210	1	1	DD1610101	Ceramic, 100PF ±10% SL
R313	1	1	RT0510414	100KΩ	P200-SEMICONDUCTORS				
R314	1	1	RT0522314	22KΩ	C211	1	1	DK1710301	Ceramic, 0.01μF ±20%
R315	1	1	RT0562114	620Ω	C212	1	1	DK1710301	Ceramic, 0.01μF ±20%
R316	1	1	RT0522314	22KΩ	C213	1	1	DK1710301	Ceramic, 0.01μF ±20%
R317	1	1	RT0562114	620Ω	C214	1	1	DK1710301	Ceramic, 0.01μF ±20%
R318	1	1	RT0510114	100Ω	C215	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%
R319	1	1	RT0510114	100Ω	C216	1	1	EA1060169	Electroly, 10μF, 16V
R320	1	1	RT0582214	8.2KΩ	C217	1	1	DD1620101	Ceramic, 200PF ±10%
R321	1	1	RT0582214	8.2KΩ	C218	1	1	DD1620101	Ceramic, 200PF ±10%
R322	1	1	RT0547114	470Ω	C219	1	1	DD1620101	Ceramic, 200PF ±10%
R323	1	1	RT0547114	470Ω	C220	1	1	EA4760109	Electroly, 47μF 10V
R324	1	1	RT0522414	220KΩ	P200-SEMICONDUCTORS				
R325	1	1	RT0522414	220KΩ	C221	1	1	DK1710301	Ceramic, 0.01μF ±20%
R326	1	1	RT0510114	100Ω	C222	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%
R327	1	1	RT0522414	220KΩ	C223	1	1	DD1610101	Ceramic, 100PF ±10%
R328	1	1	RT0515214	1.5KΩ	C224	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%
R329	1	1	RT0510214	1KΩ	C225	1	1	DF1722201	Film, 2200PF ±20%
R330	1	1	RT0527214	2.7KΩ	C226	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%
H201	1	1	HT308291C	Transistor, 2SC829(C)	C227	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%
H202	1	1	HC1000502	IC, AN217	C228	1	1	EA4740509	Electroly, 0.47μF, 50V
H203	1	1	HT308291C	Transistor, 2SC829(C)	C229	1	1	EA1050509	Electroly, 1μF, 50V
H204	1	1	HT308291C	Transistor, 2SC829(C)	C230	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%
					C231	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%
					C232	1	1	EA1070169	Electroly, 100μF, 16V
					C233	1	1	EA3360259	Electroly, 33μF, 25V
					C234	1	1	DF1740301	Film, 0.04μF ±20%
					C235	1	1	DF1740301	Film, 0.04μF ±20%

REF. DESIG.	U	E	PART NO.	DESCRIPTION	REF. DESIG.	U	E	PART NO.	DESCRIPTION
C236	1	1	DD1105001	Ceramic, 5PF ± 0.5PF	C297	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%
C237	1	1	DF1740301	Film, 0.04μF ± 20%	C298	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%
C238	1	1	EA1060169	Electroly, 10μF, 16V	C299	1	1	DD1620001	Ceramic, 20PF ±10%
C239	1	1	DF1740301	Film, 0.04μF ± 20%					P200-MISCELLANEOUS
C240	1	1	DF1740301	Film, 0.04μF ± 20%	F201	1	1	FF1107052	Ceramic Filter, CFS 10.7M
C241	1	1	DF1740301	Film, 0.04μF ± 20%	F202	1	1	FF1107052	Ceramic Filter, CFS 10.7M
C242	1	1	DF1740301	Film, 0.04μF ± 20%	F203	1	1	FF1107052	Ceramic Filter, CFS 10.7M
C243	1	1	DD1620001	Ceramic, 20PF ± 10%	L201	1	1	LI1401623	IFT, FM
C244	1	1	DF1722301	Film, 0.022μF ± 20%	L202	1	1	LI1015602	IFT, FM
C245	1	1	DF6545101	Film, 450PF ± 5%	L203	1	1	LA1001017	Coil, AM RF
C246	1	1	EA1050509	Electroly, 1μF, 50V	L204	1	1	LO1001042	Coil, AM OSC
C247	1	1	EA1060169	Electroly, 10μF, 16V	L205	1	1	LI1028002	IFT, AM
C248	1	1	DF1740301	Film, 0.04μF ± 20%	L206	1	1	LI1001048	IFT, AM
C249	1	1	DF1740301	Film, 0.04μF ± 20%	L207	1	1	LS1029004	MPX Coil, 56mH
C250	1	1	DF1740301	Film, 0.04μF ± 20%	L208	1	1	LS1029004	MPX Coil, 56mH
C251	1	1	EA1060169	Electroly, 10μF, 16V	L209	1	1	LS1029005	MPX Coil, 43mH
C252	1	1	EA1060169	Electroly, 10μF, 16V	L210	1	1	LS1029005	MPX Coil, 43mH
C253	1	1	DF1740301	Film, 0.04μF ± 20%	L205	1	1	LI1028003	IFT, AM
C254	1	1	DF1740301	Film, 0.04μF ± 20%					
C255	1	1	DF1740301	Film, 0.04μF ± 20%	1211	1	1	290810903	Shield
C256	1	1	EA1060169	Electroly, 10μF, 16V	1212	1	1	290810902	Shield
C257	1	1	DD1620101	Ceramic, 200PF ±10% SL	J201				
C258	1	1	DF1747201	Film, 4700PF ±20%	J235				
C259	1	1	DF1668301	Film, 0.068μF ±10%					
C260	1	1	DF1747201	Film, 4700PF ±20%					
C261	1	1	EA1060169	Electroly, 10μF, 16V					
C262	1	1	EA1060169	Electroly, 10μF, 16V	L007	1	1	LC1332002	GENERAL MISCELLANEOUS
C263	1	1	EA1060169	Electroly, 10μF, 16V	L008	1	1	LC1332002	Choke Coil
C264	1	1	EA1050509	Electroly, 1μF, 50V					Choke Coil
C265	1	1	EA1060169	Film, 10μF, 16V					
C266	1	1	EA2270169	Electroly, 220μF 16V					
C267	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%					POWER SUPPLY CIRCUIT BOARD -P400
C268	1	1	DF1747301	Film, 0.047μF ±20%	P400	1	1	YD2908003	P. W. Board, Power Supply (Print Only)
C269	1	1	EQ2240501	Electroly, 0.22μF ±20%					P. W. Board Assembly
C270	1	1	EQ2240501	Electroly, 0.22μF ±20%					
C271	1	1	EQ4740501	Electroly, 0.47μF ±20%					
C272	1	1	DF5547101	Film, 470PF ±5%	R401	1	1	GS1010105	P400-RESISTORS
C273	1	1	DF1615205	Film, 1500PF ±10%	R402	1	1	RC1033212	100Ω ±10%, 5W
C274	1	1	DF1615205	Film, 1500PF ±10%	R403	1	1	RC1012012	3.3KΩ ±10%, ½W
C275	1	1	DD1536101	Ceramic, 360PF ±5%	R404	1	1	RC1018112	12Ω ±10%, ½W
C276	1	1	DD1536101	Ceramic, 360PF ±5%	R405	1	1	RC1015112	180Ω ±10%, ½W
C277	1	1	DF1633205	Film, 3300PF ±10%	R406	1	1	RC1015312	150Ω ±10%, ½W
C278	1	1	DF1633205	Film, 3300PF ±10%	R407	1	1	RC1010312	15KΩ ±10%, ½W
C279	1	1	DF1515205	Film, 1500PF ±5%	R408	1	1	RC1010112	10KΩ ±10%, ½W
C280	1	1	DF1515205	Film, 1500PF ±5%	R409	1	1	RC1012012	100Ω ±10%, ½W
C281	1	1	DF1622205	Film, 2200PF ±10%	R410	1	1	RC1047112	12Ω ±10%, ½W
C282	1	1	DF1622205	Film, 2200PF ±10%	R412	1	1	RC1010112	470Ω ±10%, ½W
C283	1	1	DF1510205	Film, 1000PF ±5%	R411	1	1	RC1033012	100Ω ±10%, ½W
C284	1	1	DF1510205	Film, 1000PF ±5%					33Ω ±10%, ½W
C285	1	1	EV2240351	Electroly, 0.22μF ±20%, 35V					P400-CAPACITORS
C286	1	1	EV2240351	Electroly, 0.22μF ±20%, 35V	C401	1	1	DK1810351	Ceramic, 0.01μF +100%,-0%,50V
C287	1	1	EA1050509	Electroly, 1μF, 50V	C402	1	1	DK1810351	Ceramic, 0.01μF +100%,-0%,50V
C288	1	1	EA1050509	Electroly, 1μF, 50V	C403	1	1	EA3370509	Electroly, 330μF, 50V
C289	1	1	EA2270359	Electroly, 220μF, 35V	C404	1	1	EA3370509	Electroly, 330μF, 50V
C290	1	1	EA1060169	Electroly, 10μF, 16V	C405	1	1	EA1070259	Electroly, 100μF, 25V
C291	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%	C406	1	1	EA1070259	Electroly, 100μF, 25V
C292	1	1	EA1060169	Electroly, 10μF, 16V	C407	1	1	EA1070109	Electroly, 100μF, 10V
C293	1	1	EV1040251	Electroly, 0.1μF, 25V	C408	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%,
C294	1	1	EA1060169	Electroly, 10μF, 16V	C409	1	1	EA1070359	Electroly, 100μF, 35V
C295	1	1	DK1710301	Ceramic, 0.01μF ±20%	C410	1	1	EA1070359	Electroly, 100μF, 35V
C296	1	1	DK1840301	Ceramic, 0.04μF +100%,-0%	C411	1	1	EA1070169	Electroly, 100μF, 16V

REF. DESIG.	U	E	PART NO.	DESCRIPTION
C412	1	1	DK1840301	Cramic, 0.04μF +100%,-0%
				P400-SEMICONDUCTORS
H401	1	1	HT403154A	Transistor, 2SD315 (C,D,E,F)
H402	1	1	HT313842C	Transistor, 2SC1384 R or S
H403	1	1	HD2000501	Diode, W 06B
H404	1	1	HD2000501	Diode, W 06B
H405	1	1	HD3003209	Diode, CZ-142
H406	1	1	HD3003609	Diode, WZ065
H407	1	1	HD3002709	Diode, WZ-140
				P400-MISCELLANEOUS
J401	1	1	YP1000113	Plug
J408				
1111	1	1	273026702	Heat Sink, Power Transistor
1112	2	2	53110303E	Hexagon Nut
				GENERAL MISCELLANEOUS
0603	1	1	290816050	Bracket K
0621	1	1	285427401	Reflector
0625	1	1	51480306A	B. H. M. Screw F
0627	2	2	51570306B	P. H. Tapt Screw
0628	2	2	54050300R	T. L. Washer OR
0708	1	1	287105302	Cover
0713	1	1	290820101	Partitioner
0714	2	2	51570306B	P. H. Tapt Screw
0726	1	1	290805150	Guide K
0729	4	4	51042606A	F. H. M. Screw
				P 3 x 6 ST
0730	2	2	53112603A	Hexagon Nut
0903	1	1	290826250	Pulley K
0907	2	2	51100306A	B. H. M. Screw
0917	2	2	127126201	Pulley
0918	2	2	263711203	Shaft
0610	1	1	290827401	Reflector
0612	1	1	290827101	Holder
0614	2	2	51100308S	B. H. M. Screw
0615	2	2	53110303A	Hexagon Nut
0617	2	2	51570306B	P. H. Tapt Screw
				P 3x6 ST
0618	2	2	51480306A	B. H. M. Screw F
				DIAL LAMP BOARD-PZ01
PZ01	1	1	YD2908007	P.W. Board, Dial Lamp (Print Only)
	1	1	ZZ2908007	P. W. Board Assembly
				PZ01-MISCELLANEOUS
MZO1	1	1	IN1008007	Lamp, Dial Illumination
MZO4				
JZ01	1	1	YP1000113	Plug
JZ04				
JZ05	1	1	YJ0800017	Socket
JZ12				
				FUNCTION LAMP BOARD-PY01

REF. DESIG.	U	E	PART NO.	DESCRIPTION
PY01	1	1	YD2908006	P. W. Board, Function Lamp (Print Only)
	1	1	ZZ2908006	P. W. Board Assembly
				PY01-MISCELLANEOUS
MY01	1	1	IN1006301	Lamp
MY04				
MY05	1	1	IN1012011	Lamp
JY01	1	1	YP1000113	Plug
JY06				
				GENERAL MISCELLANEOUS
0726	1	1	290805150	Guide K
0910	1	1	290826251	Pulley K
0914	1	1	51100306A	B. H. M. Screw
				B 3 x 6
M001	1	1	IM1104208	DC Meter, FM/AM
0630	1	1	288610701	Sheet
0622	1	1	285427101	Holder
0624	1	1	51570306B	P. H. Tapt Screw
				P 3 x 6 ST
M002	1	1	IN1008007	Lamp
J008	1	1	YJ0800019	Socket
0616	1	1	121000501	Clamper
0403	1	1	290816001	Bracket
0409	1	1	289611801	Spacer
0410	2	2	51100308S	B. H. M. Screw
0411	2	2	53110303A	Hexagon Nut
0413	1	1	145525903	Bush
0414	1	1	284906702	Cap
0419	2	2	51060316A	P. H. M. Screw
0420	2	2	53110303A	Hexagon Nut
0426	2	2	51100306S	B. H. M. Screw
				B 3 x 6
0427	2	2	53110303A	Hexagon Nut
0429	2	2	51100306S	B. H. M. Screw
0430	2	2	53110303A	Hexagon Nut
0432	2	2	51100306S	B. H. M. Screw
0433	2	2	53110303A	Hexagon Nut
0516	3	3	51100306S	B. H. M. Screw
0519	1	1	145525903	Bush
G001	1	1	BF1040002	Printed Compo.
L002	1	1	LB3007526	Balun Coil
L006	1	1	LC1154004	Choke Coil,
F001	1	1	FS1005009	Fuse, 0.5A
J001	1	1	YT0304009	Terminal,
J003	1	1	YT0201009	Ant.
J004	1	1	YT0202011	Terminal, Quadradiol Output
J006	1	1	YJ0800012	Terminal, Output
J007	1	1	YJ0400048	Socket, Fuse Holder
J013	1	1	YL102003	Socket, AC Outlet
				Terminal, 2P
W001	1	1	YC0240010	AC Cord
W001	1	1	YC0190003	AC Cord
C002	1	1	DF1756351	Film Cap.,
L001	1	1	LF1120038	Ant. Coil, AM
				0.056μF±20%
0503	1	1	257816052	Bracket K
0508	1	1	281927103	Holder,
0509	2	2	51100310S	B. H. M. Screw
0510	2	2	53110303E	Hexagon Nut
0512	2	2	51100308S	B. H. M. Screw
0513	2	2	53110303E	Hexagon Nut
				Ant. B 3 x 10
				B 3 x 8

REF. DESIG.	U	E	PART NO.	DESCRIPTION	REF. DESIG.	U	E	PART NO.	DESCRIPTION
0425 1226	1	1	138200503 62030039W	Clamper Lug	PT01	1	1	YD2908005 ZZ2908005	MODE SWITCH CIRCUIT BOARD-PT01 P. W. Board, Mode Switch (Print Only) P. W. Board Assembly
R001	1		GT0522512	Resistor, 2.2MΩ ±5%, ½W	RT01	1	1	RT0556414 RT0539414	PT01-MISCELLANEOUS Resistor, 560KΩ ±5%, ½W Resistor, 390KΩ ±5%, ½W
0703 0707 0812 0813 0815 0827 1116 1117 1118	1	1	290830201 282705302 290810401 290810601 51040306E 51064019A 290812002 54060300R 51570312B	Dial Cover Retainer Bearing F. H. M. Screw F 3 x 6 Screw Insulator T. L. Washer IR P. H. Tapt Screw P 3 x 12	RT03 RT04 CT01 HT01 ST01 JT01 JT08	1	1	RT0524314 RT0510414 EA4760109 HT3037204 SP0202014 YP1000113	Resistor, 24KΩ ±5%, ½W Resistor, 100KΩ ±5%, ½W Electroly Cap., 47μF 10V Transistor, 2SC372 (Y) Pushswitch Plug
W004 W005 W006 J009	1		YB0007001 YB0007001 YB0027001 YL0106004	Wire Material Wire Material Wire Material Terminal	S001	1	1	SP0301003	GENERAL MISCELLANEOUS Pushswitch
1121 1123	1		285216006 51062606A	Bracket P. H. M. Screw P 2.6 x 6	0203 0204 0332 0333 0335 0336 0337 0338 0339 0340 0341 0342 0343 0344 0345 0346 0347 0348 0349 0350 0351 0352 0353 0354 0355 0356 0357 0358 0359 0360 0361 0362 0363 0364 0365 0366 0367 0368 0369 0370 0371 0372 0373 0374 0375 0376 0377 0378 0379 0380 0381 0382 0383 0384 0385 0386 0387 0388 0389 0390 0391 0392 0393 0394 0395 0396 0397 0398 0399 0400 0401 0402 0403 0404 0405 0406 0407 0408 0409 0410 0411 0412 0413 0414 0415 0416 0417 0418 0419 0420 0421 0422 0423 0424 0425 0426 0427 0428 0429 0430 0431 0432 0433 0434 0435 0436 0437 0438 0439 0440 0441 0442 0443 0444 0445 0446 0447 0448 0449 0450 0451 0452 0453 0454 0455 0456 0457 0458 0459 0460 0461 0462 0463 0464 0465 0466 0467 0468 0469 0470 0471 0472 0473 0474 0475 0476 0477 0478 0479 0480 0481 0482 0483 0484 0485 0486 0487 0488 0489 0490 0491 0492 0493 0494 0495 0496 0497 0498 0499 0500 0501 0502 0503 0504 0505 0506 0507 0508 0509 05010 05011 05012 05013 05014 05015 05016 05017 05018 05019 05020 05021 05022 05023 05024 05025 05026 05027 05028 05029 05030 05031 05032 05033 05034 05035 05036 05037 05038 05039 05040 05041 05042 05043 05044 05045 05046 05047 05048 05049 05050 05051 05052 05053 05054 05055 05056 05057 05058 05059 05060 05061 05062 05063 05064 05065 05066 05067 05068 05069 05070 05071 05072 05073 05074 05075 05076 05077 05078 05079 05080 05081 05082 05083 05084 05085 05086 05087 05088 05089 05090 05091 05092 05093 05094 05095 05096 05097 05098 05099 050100 050101 050102 050103 050104 050105 050106 050107 050108 050109 050110 050111 050112 050113 050114 050115 050116 050117 050118 050119 050120 050121 050122 050123 050124 050125 050126 050127 050128 050129 050130 050131 050132 050133 050134 050135 050136 050137 050138 050139 050140 050141 050142 050143 050144 050145 050146 050147 050148 050149 050150 050151 050152 050153 050154 050155 050156 050157 050158 050159 050160 050161 050162 050163 050164 050165 050166 050167 050168 050169 050170 050171 050172 050173 050174 050175 050176 050177 050178 050179 050180 050181 050182 050183 050184 050185 050186 050187 050188 050189 050190 050191 050192 050193 050194 050195 050196 050197 050198 050199 050200 050201 050202 050203 050204 050205 050206 050207 050208 050209 050210 050211 050212 050213 050214 050215 050216 050217 050218 050219 050220 050221 050222 050223 050224 050225 050226 050227 050228 050229 050230 050231 050232 050233 050234 050235 050236 050237 050238 050239 050240 050241 050242 050243 050244 050245 050246 050247 050248 050249 050250 050251 050252 050253 050254 050255 050256 050257 050258 050259 050260 050261 050262 050263 050264 050265 050266 050267 050268 050269 050270 050271 050272 050273 050274 050275 050276 050277 050278 050279 050280 050281 050282 050283 050284 050285 050286 050287 050288 050289 050290 050291 050292 050293 050294 050295 050296 050297 050298 050299 0502100 0502101 0502102 0502103 0502104 0502105 0502106 0502107 0502108 0502109 0502110 0502111 0502112 0502113 0502114 0502115 0502116 0502117 0502118 0502119 0502120 0502121 0502122 0502123 0502124 0502125 0502126 0502127 0502128 0502129 0502130 0502131 0502132 0502133 0502134 0502135 0502136 0502137 0502138 0502139 0502140 0502141 0502142 0502143 0502144 0502145 0502146 0502147 0502148 0502149 0502150 0502151 0502152 0502153 0502154 0502155 0502156 0502157 0502158 0502159 0502160 0502161 0502162 0502163 0502164 0502165 0502166 0502167 0502168 0502169 0502170 0502171 0502172 0502173 0502174 0502175 0502176 0502177 0502178 0502179 0502180 0502181 0502182 0502183 0502184 0502185 0502186 0502187 0502188 0502189 0502190 0502191 0502192 0502193 0502194 0502195 0502196 0502197 0502198 0502199 0502200 0502201 0502202 0502203 0502204 0502205 0502206 0502207 0502208 0502209 0502210 0502211 0502212 0502213 0502214 0502215 0502216 0502217 0502218 0502219 0502220 0502221 0502222 0502223 0502224 0502225 0502226 0502227 0502228 0502229 0502230 0502231 0502232 0502233 0502234 0502235 0502236 0502237 0502238 0502239 0502240 0502241 0502242 0502243 0502244 0502245 0502246 0502247 0502248 0502249 0502250 0502251 0502252 0502253 0502254 0502255 0502256 0502257 0502258 0502259 0502260 0502261 0502262 0502263 0502264 0502265 0502266 0502267 0502268 0502269 0502270 0502271 0502272 0502273 0502274 0502275 0502276 0502277 0502278 0502279 0502280 0502281 0502282 0502283 0502284 0502285 0502286 0502287 0502288 0502289 0502290 0502291 0502292 0502293 0502294 0502295 0502296 0502297 0502298 0502299 0502300 0502301 0502302 0502303 0502304 0502305 0502306 0502307 0502308 0502309 0502310 0502311 0502312 0502313 0502314 0502315 0502316 0502317 0502318 0502319 0502320 0502321 0502322 0502323 0502324 0502325 0502326 0502327 0502328 0502329 0502330 0502331 0502332 0502333 0502334 0502335 0502336 0502337 0502338 0502339 0502340 0502341 0502342 0502343 0502344 0502345 0502346 0502347 0502348 0502349 0502350 0502351 0502352 0502353 0502354 0502355 0502356 0502357 0502358 0502359 0502360 0502361 0502362 0502363 0502364 0502365 0502366 0502367 0502368 0502369 0502370 0502371 0502372 0502373 0502374 0502375 0502376 0502377 0502378 0502379 0502380 0502381 0502382 0502383 0502384 0502385 0502386 0502387 0502388 0502389 0502390 0502391 0502392 0502393 0502394 0502395 0502396 0502397 0502398 0502399 0502400 0502401 0502402 0502403 0502404 0502405 0502406 0502407 0502408 0502409 0502410 0502411 0502412 0502413 0502414 0502415 0502416 0502417 0502418 0502419 0502420 0502421 0502422 0502423 0502424 0502425 0502426 0502427 0502428 0502429 0502430 0502431 0502432 0502433 0502434 0502435 0502436 0502437 0502438 0502439 0502440 0502441 0502442 0502443 0502444 0502445 0502446 0502447 0502448 0502449 0502450 0502451 0502452 0502453 0502454 0502455 0502456 0502457 0502458 0502459 0502460 0502461 0502462 0502463 0502464 0502465 0502466 0502467 0502468 0502469 0502470 0502471 0502472 0502473 0502474 0502475 0502476 0502477 0502478 0502479 0502480 0502481 0502482 0502483 0502484 0502485 0502486 0502487 0502488 0502489 0502490 0502491 0502492 0502493 0502494 0502495 0502496 0502497 0502498 0502499 0502500 0502501 0502502 0502503 0502504 0502505 0502506 0502507 0502508 0502509 0502510 0502511 0502512 0502513 0502514 0502515 0502516 0502517 0502518 0502519 0502520 0502521 0502522 0502523 0502524 0502525 0502526 0502527 0502528 0502529 0502530 0502531 0502532 0502533 0502534 0502535 0502536 0502537 0502538 0502539 0502540 0502541 0502542 0502543 0502544 0502545 0502546 0502547 0502548 0502549 0502550 0502551 0502552 0502553 0502554 0502555 0502556 0502557 0502558 0502559 0502560 0502561 0502562 0502563 0502564 0502565 0502566 0502567 0502568 0502569 0502570 0502571 0502572 0502573 0502574 0502575 0502576 0502577 0502578 0502579 0502580 0502581 0502582 0502583 0502584 0502585 0502586 0502587 0502588 0502589 0502590 0502591 0502592 0502593 0502594 0502595 0502596 0502597 0502598 0502599 0502600 0502601 0502602 0502603 0502604 0502605 0502606 0502607 0502608 0502609 0502610 0502611 0502612 0502613 0502614 0502615 0502616 0502617 0502618 0502619 0502620 0502621 0502622 0502623 0502624 0502625 0502626 0502627 0502628 0502629 0502630 0502631 0502632 0502633 0502634 0502635 0502636 0502637 0502638 0502639 0502640 0502641 0502642 0502643 0502644 0502645 0502646 0502647 0502648 0502649 0502650 0502651 0502652 0502653 0502654 0502655 0502656 0502657 0502658 0502659 0502660 0502661 0502662 0502663 0502664 0502665 0502666 0502667 0502668 0502669 0502670 0502671 0502672 0502673 0502674 0502675 0502676 0502677 0502678 0502679 0502680 0502681 0502682 0502683 0502684 0502685 0502686 0502687 0502688 0502689 0502690 0502691 0502692 0502693 0502694 0502695 0502696 0502697 0502698 0502699 0502700 0502701 0502702 0502703 0502704 0502705 0502706 0502707 0502708 0502709 0502710 0502711 0502712 0502713 0502714 0502715 0502716 0502717 0502718 0502719 0502720 0502721 0502722 0502723 0502724 0502725 0502726 0502727 0502728 0502729 0502730 0502731 0502732 0502733 0502734 0502735 0502736 0502737 0502738 0502739 0502740 0502741 0502742 0502743 0502744 0502745 0502746 0502747 0502748 0502749 0502750 0502751 0502752 0502753 0502754 0502755 0502756 0502757 0502758 0502759 0502760 0502761 0502762 0502763 0502764 0502765 0502766 0502767 0502768 0502769 0502770 0502771 0502772 0502773 0502774 0502775 0502776 0502777 0502778 0502779 0502780 0502781 0502782 0502783 0502784 0502785 0502786 0502787 0502788 0502789 0502790 0502791 0502792 0502793 0502794 0502795 0502796 0502797 0502798 0502799 0502800 0502801 0502802 0502803 0502804 0502805 0502806 0502807 0502808 0502809 0502810 0502811 0502812 0502813 0502814 0502815 0502816 0502817 0502818 0502819 0502820 0502821 0502822 0502823 0502824 0502825 0502826 0502827 0502828 0502829 0502830 0502831 0502832 0502833 0502834 0				

REF. DESIG.	U	E	PART NO.	DESCRIPTION	REF. DESIG.	U	E	PART NO.	DESCRIPTION
A001	1	1	AV0120202	FM Front End Assembly	L003	1	TS1601502	Power Transf.	
				FM FRONT END CIRCUIT BOARD—P100	0111	4	4	52017039J	Bolt
P100	1	1	YD2908001	P. W. Board, FM Front End (Print Only)	0116	6	6	281815401	Knob
	1	1	ZZ2908001	P. W. Board Assembly	0124	4	4	51480406S	B. H. M. Screw F
				P100—RESISTORS	0131	1	1	282825702	Lid
R101	1	1	RT0510414	100KΩ	0133	8	8	51100406S	B. H. M. Screw B 4 x 6
R102	1	1	RT0510514	1MΩ	0303	1	1	290826501	Indicator, Name Plate
R103	1	1	RT0510114	100Ω	0305	1	1	290826503	Indicator, Name Plate
R104	1	1	RT0510114	100Ω	0312	2	2	51100305S	B. H. M. Screw B 3 x 5
R105	1	1	RT0510314	10KΩ	0316	1	1	257886101	Label, UL Caution
R106	1	1	RT0533214	3.3KΩ	0317	1	1	257886102	Label, Do Not Remove...
R107	1	1	RT0522214	2.2KΩ	0318	1	1	257886103	Label, See, Marking
R108	1	1	RT0510314	10KΩ	0320	1	1	250626506	Indicator, Do Not Use
R109	1	1	RT0510114	100Ω	0323	1	1	951110103	Label, UL
R110	1	1	RT0510314	10KΩ	0324	1	1	951091102	Label, UL Factory Co. No.
R111	1	1	RT0510314	10KΩ	0710	1	1	287311802	Spacer
R112	1	1	RT0522214	2.2KΩ	0717	1	1	290826901	Protector
R113	1	1	RT0510114	100Ω	0718	2	2	51570306B	P. H. Tapt Screw P 3 x 6 ST
					0732	1	1	290805102	Guide
				P100—CAPACITORS	0733	2	2	51102605E	B. H. M. Screw B 2.6 x 5
C101	1	1	CT1120003	Trimming, 12PF	0819	1	1	290826201	Pulley
C102	1	1	CT1120003	Trimming, 12PF	0821	2	2	59058002G	Washer
C103	1	1	CT1120003	Trimming, 12PF					
C104	1	1	CT1120003	Trimming, 12PF	0823	1	1	53110303E	Hexagon Nut
C108	1	1	CA4330001	Variable, AM3G, FM4G	0824	1	1	54040302N	Spring Washer
C109	1	1	DD1620001	Ceramic, 20PF ±10%	0828	2	2	51470306A	B. H. M. Screw S
C110	1	1	DK1710201	Ceramic, 1000PF ±20%	1208	1	1	290810901	Shield
C111	1	1	DK1710301	Ceramic, 0.01μF ±20%	1209	5	5	51570306S	P. H. Tapt Screw P 3 x 6 ST
C112	1	1	DK1710301	Ceramic, 0.01μF ±20%	1320	1	1	56382540G	Eyelet
C113	1	1	DD1522001	Ceramic, 22PF ±5%	1323	1	1	290825901	Bush
C114	1	1	DD1620001	Ceramic, 20PF ±10%	1523	4	1	952281501	Serial No. Card
C115	1	1	DD1205001	Ceramic, 5PF ±0.5PF	1525	4	1	952301511	Serial No. Card
C116	1	1	DD1518001	Ceramic, 18PF ±5% SL	F001	1	1	FS1005007	Fuse, 0.5A
C117	1	1	DK1710201	Ceramic, 1000PF ±20%	F002	1	1	FS1030004	Fuse, 3A
C118	1	1	DK1710301	Ceramic, 0.01μF ±20%	F003	1	1	FS1005003	Fuse, 0.5A
C119	1	1	DD1650001	Ceramic, 50PF ±10%					
C120	1	1	DK1710301	Ceramic, 0.01μF ±20%	1403	1	1	290885101	Instructions, Set
C121	1	1	DD1001003	Ceramic, 1PF ±0.25PF CH	1404	1	1	290885121	Instructions, Set
C122	1	1	DD1615009	Ceramic, 15PF (RH)	1409	1	1	290885601	Schematic Diagram
C123	1	1	DD1610004	Ceramic, 10PF (RH)	1411	1	1	290885603	Schematic Diagram
C124	1	1	DD1207005	Ceramic, 7PF ±1PF (RH)	1416	1	1	288585107	Instructions, Set Mounting
C125	1	1	DD1615009	Ceramic, 15PF	1417	1	1	288785108	Accessories
C126	1	1	DD1610004	Ceramic, 10PF (RH)	1418	1	1	281881304	Partitioner
C127	1	1	DK1710301	Ceramic, 0.01μF ±20%	1423	1	1	257785401	Guarantee Card
C128	1	1	DK1710301	Ceramic, 0.01μF ±20%	1424	1	1	257785102	Instructions, Red Tag
				P100—MISCELLANEOUS	1425	1	1	257781301	Envelope
L104	1	1	LO1027901	OSC Coil, FM	1431	1	1	281881301	Envelope
L105	1	1	LI1001901	IFT, FM					
H101	1	1	HF200551D	FET, 2SK55 (D)	1503	1	1	290880101	Packing Case Inner
H102	1	1	HT305351B	Transistor, 2SC535 (B)	1504	1	1	290880111	Packing Case Outer
H103	1	1	HT304611B	Transistor, 2SC461 (B)	1509	2	2	289180301	Partitioner
J101	~	1	YP1000114	Plug	1512	1	1	901383033	Polyethylen Bag, Set
J106	1	1			1514	1	1	901302501	Polyethylen Bag, Printed Matter
					1515	1	1	901302501	Polyethylen Bag, Accessories
					1517	1	1	102980401	Sleeve
					1518	1	1	956000004	Hang Tag
					1519	1	1	281905601	Buffer
					1520	2	2	273182101	Silicagel
				GENERAL MISCELLANEOUS					
L003	1		TS1601501	Power Transf.	1531	1	1	ZA0200007	Ext. Antenna, FM
					1532	1	1	ED0120006	Connective Cord

8. TECHNICAL SPECIFICATIONS

FM SECTION

Tuning Frequency Range	88 – 108MHz
IHFM Usable Sensitivity	2.0 μ V
IHF Selectivity	60dB
Capture Ratio	1.5dB
Image Rejection Ratio at 106MHz	70dB
Signal to Noise Ratio (Mono)	70dB
Signal to Noise Ratio (Stereo)	60dB
Total Harmonic Distortion (Mono)	0.15%
Total Harmonic Distortion (Stereo)	0.3%
Frequency Response (ref. 50 μ sec. de-emphasis)	\pm 1dB, 50Hz – 15KHz \pm 1dB
Stereo Separation at 1KHz	42dB

AM SECTION

Tuning Frequency Range	535 – 1605KHz
Usable Sensitivity	20 μ V
Selectivity	26dB
Image Rejection Ratio	70dB
Signal to Noise Ratio	50dB
Frequency Response (-3dB down)	50Hz – 2.5KHz
Total Harmonic Distortion	1%

GENERAL

Power Requirements	220 Volts ~ 50/60Hz (This unit can be converted by a qualified technician to operate on 110/120/240 V ~ 50/60Hz)
Power Consumption	20 Watts
Dimensions – Panel Width	14-11/64 inches
– Panel Height	4-23/32 inches
– Depth	11-1/32 inches
Weight – Unit alone	14.1 lbs.
– Packed for Shipment	21.6 lbs.

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

marantz

NOTE

SERVICE INFORMATION FOR EUROPEAN MODEL

The information contained here in included the rear panel and main chassis component locations, schematic diagram, voltage conversion and FTZ regulation.

For the circuit description, alignment method and repairing hints, refer to the original service manual.

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FTZ Regulation	29

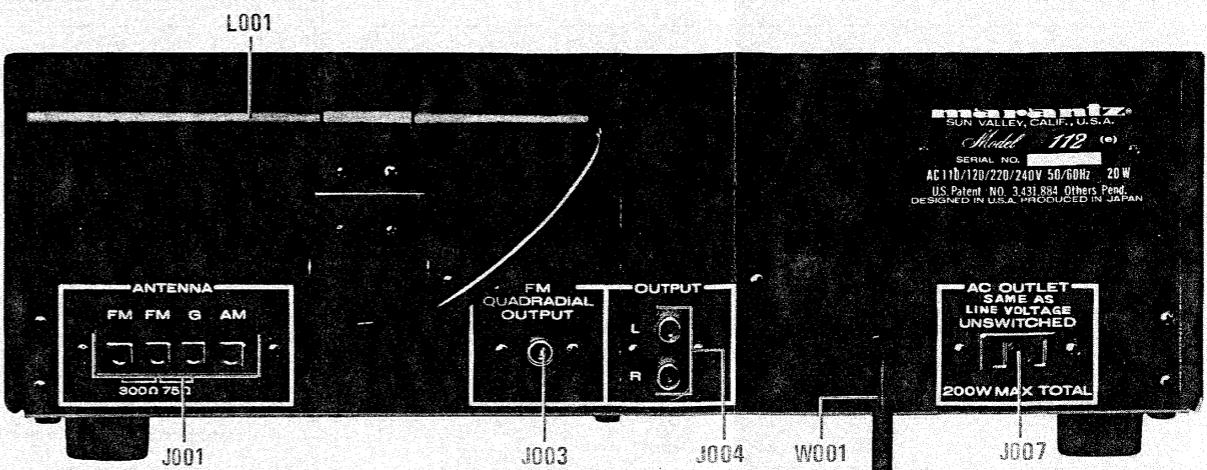


Figure 16. Rear Panel Adjustment and Component Locations

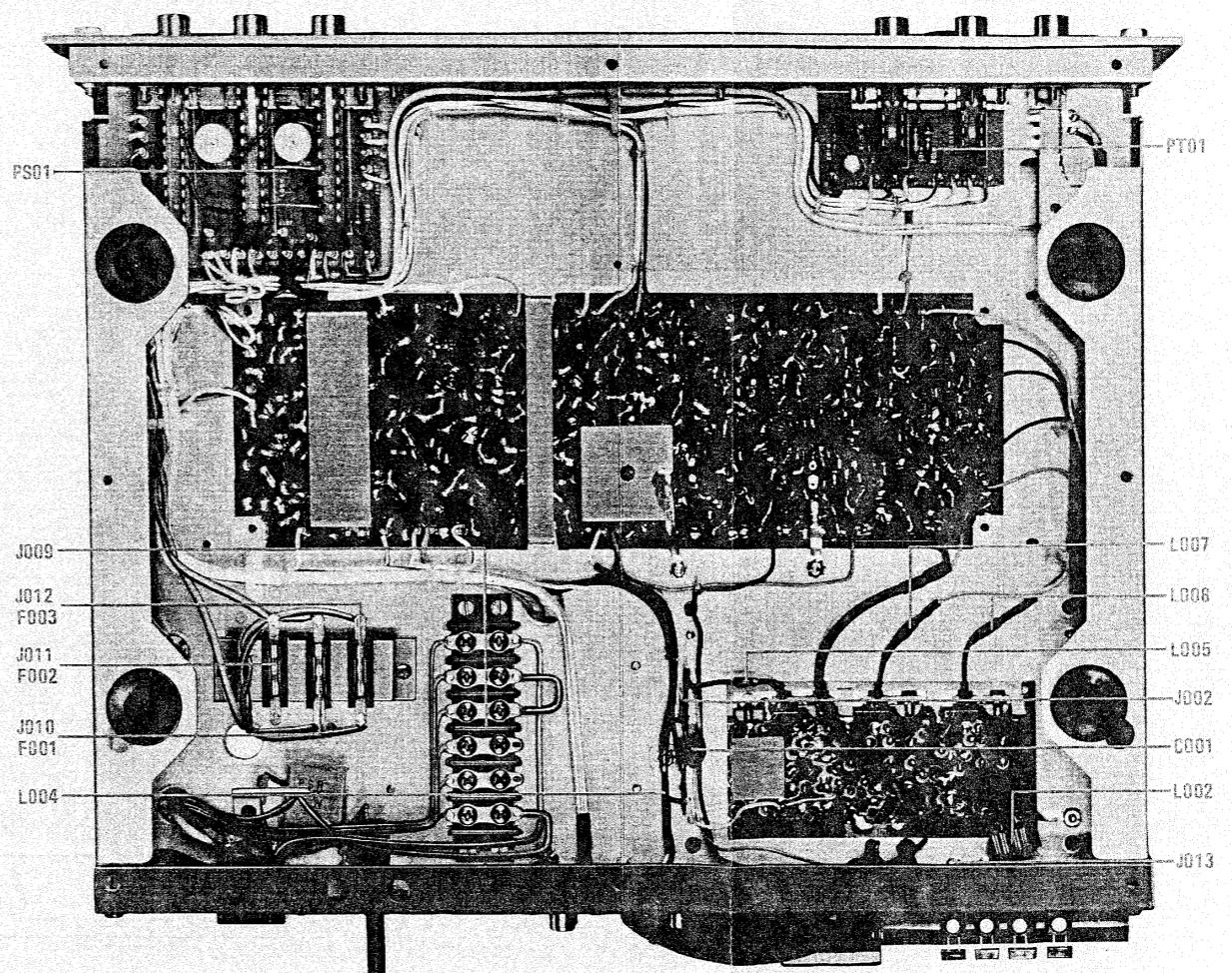


Figure 17. Main Chassis Component Locations (Bottom View)

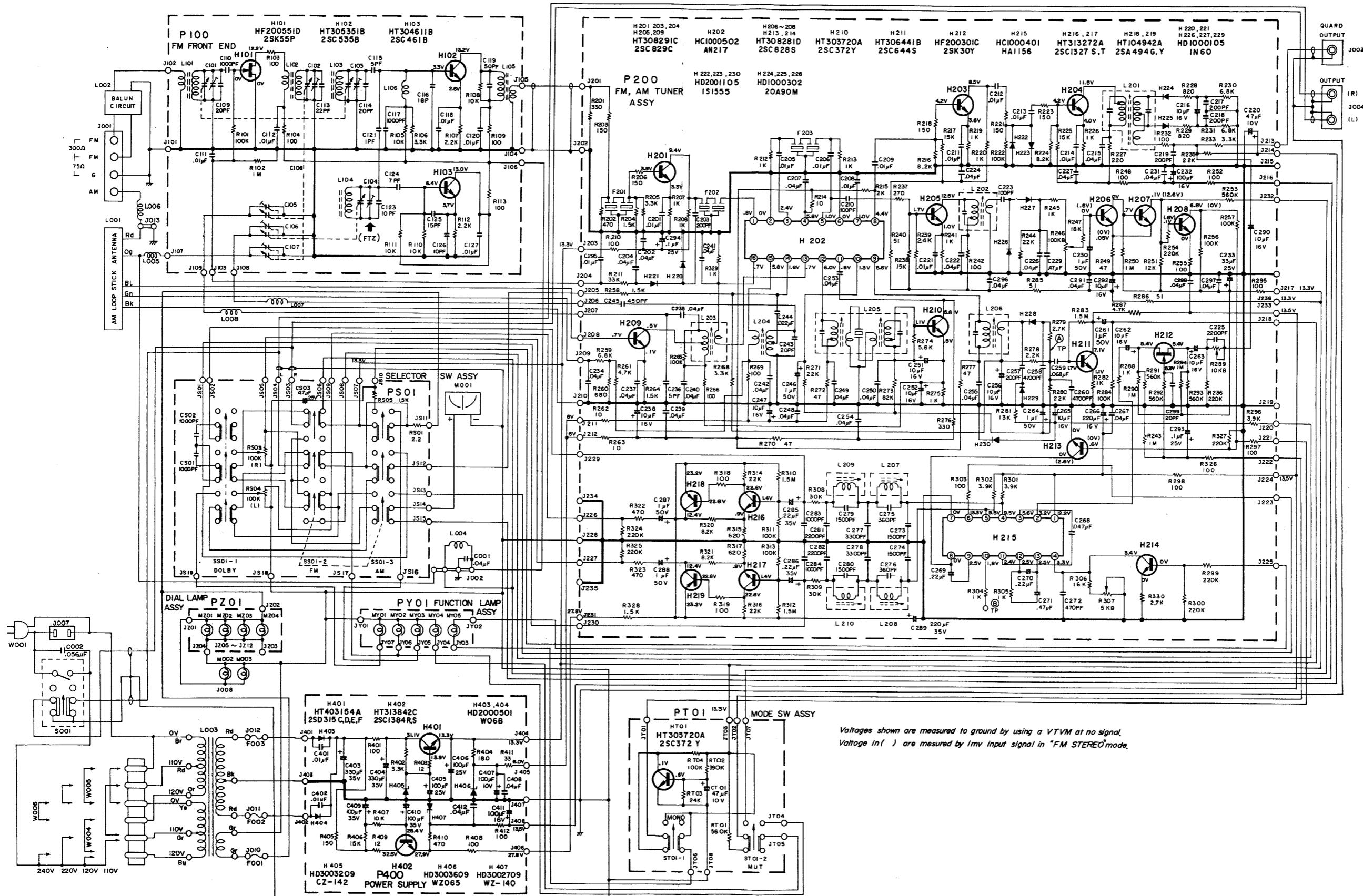


Figure 18. Schematic Diagram

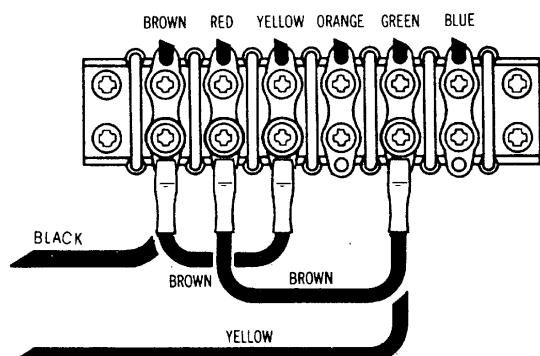
VOLTAGE CONVERSION

This model is equipped with a universal power transformer to permit operation at 110, 120, 220 and 240 V AC 50 to 60 Hz.

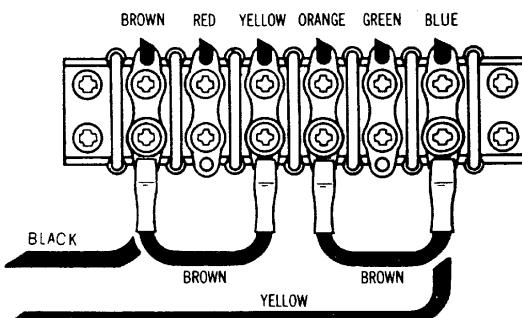
To convert the unit to the required voltage perform the following steps:

- (1) Remove the lid (top).
- (2) Change the jumper wires as illustrated below for the required AC voltage.

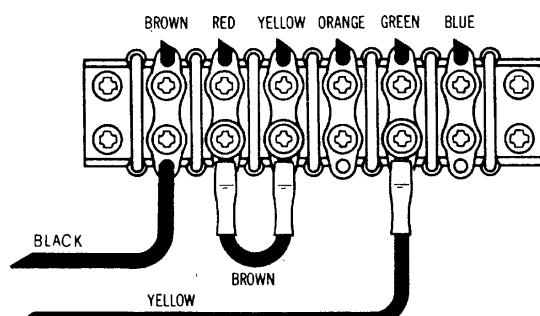
CAUTION: DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE.



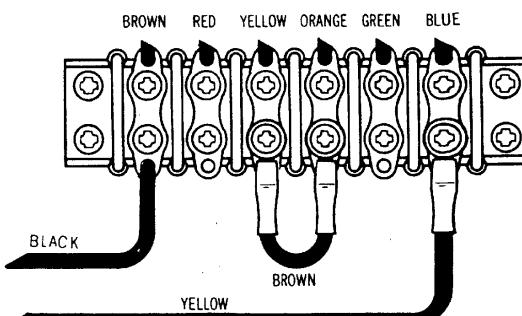
For 110V Operation



For 120V Operation



For 220V Operation



For 240V Operation

Figure 19. Voltage Conversion Chart

FTZ REGULATION

Instruction for the use in the range other than specified in FTZ codes

Achtung für die Leute, die in dem Gebiet wohnen, wo die FTZ-Bestimmungen vorherrschend sind.

Sollte das Gerät auch für Frequenzen ausserhalb des in den FTZ-Bestimmungen angegebenen Bereiches empfangebereit sein, bitten wir, den Bereich durch Nachstellen des Kernes in der Oszillatorschaltung (in der Abbildung mit "FTZ" gekennzeichnet) so zu korrigieren, dass er den Bestimmungen entspricht.