



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.

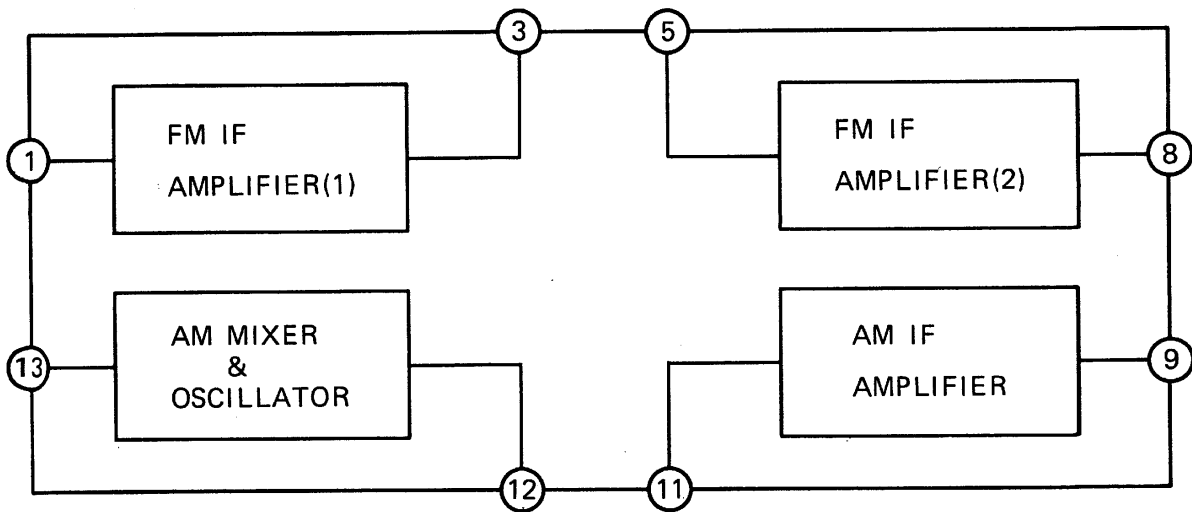


Figure 1. Block Diagram of the AN217

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 ④ 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 feeds 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 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 ⑭. 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 ⑭ 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 ⑭ 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 ③, 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 ③ .
- (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 μ 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 μ 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 1K μ 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 1K μ 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 ③) 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

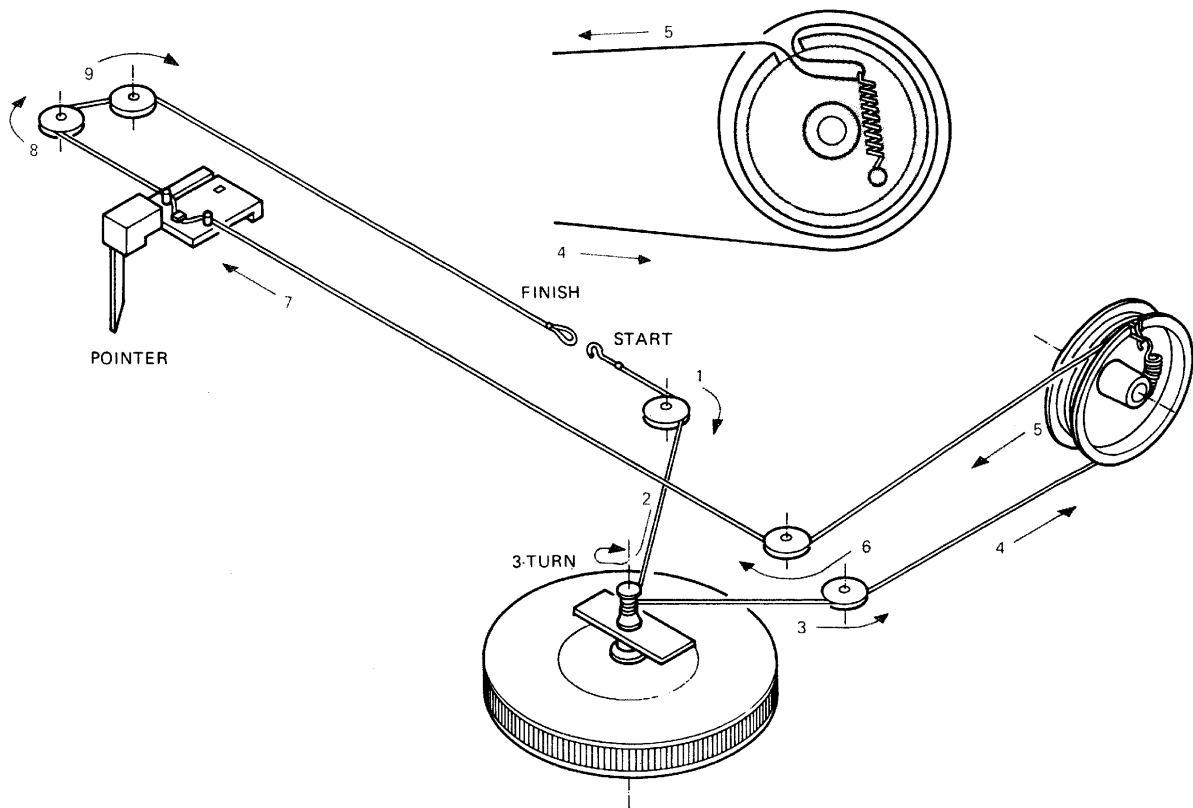


Figure 3. Dial Stringing

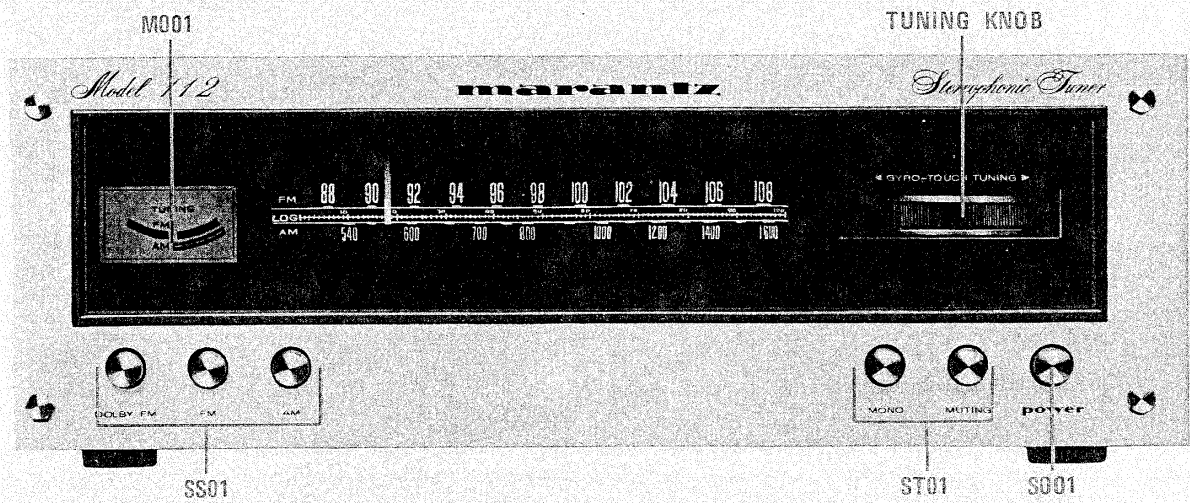


Figure 4. Front Panel Adjustment and Component Locations

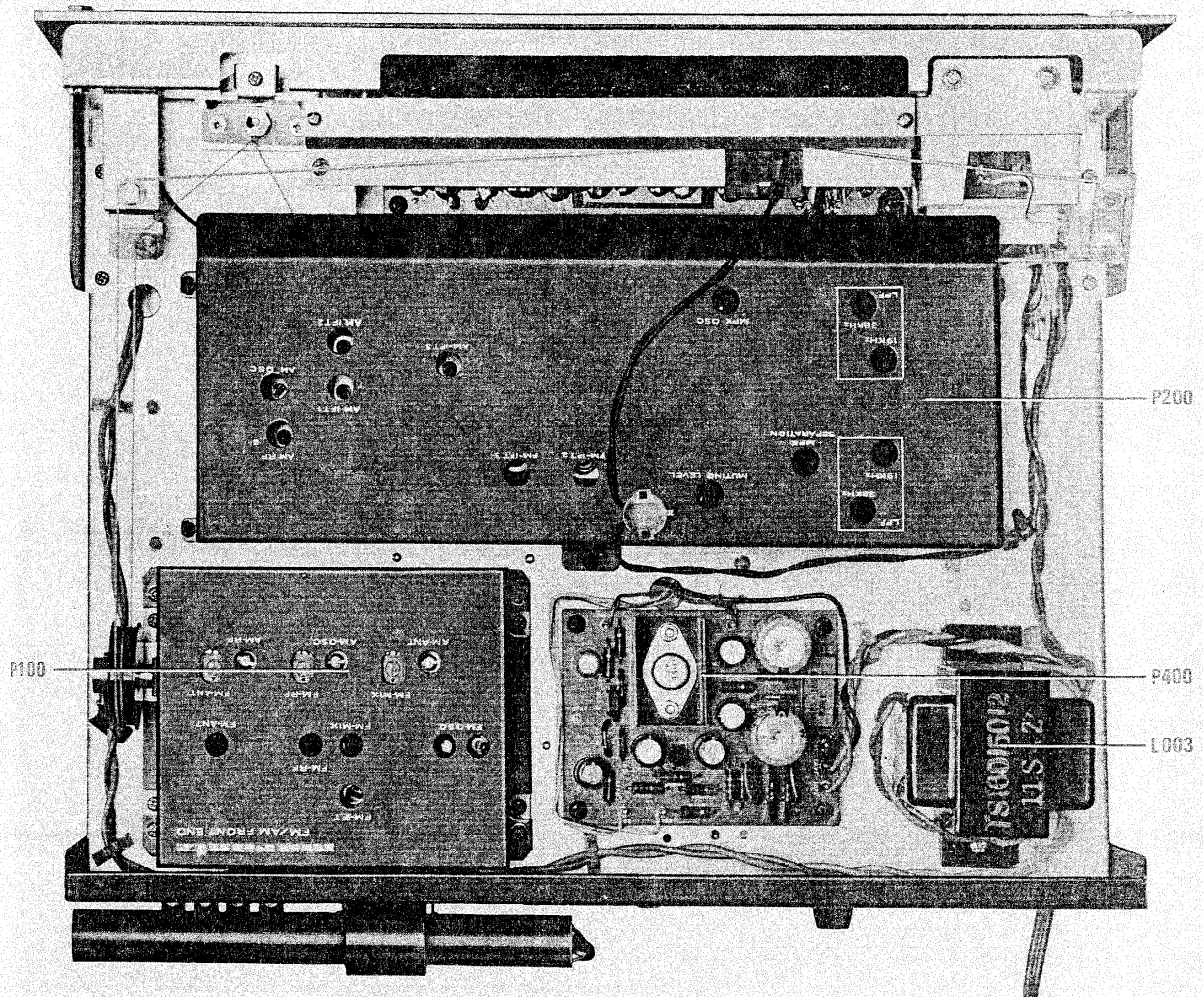


Figure 5. Main Chassis Component Locations (Top View)

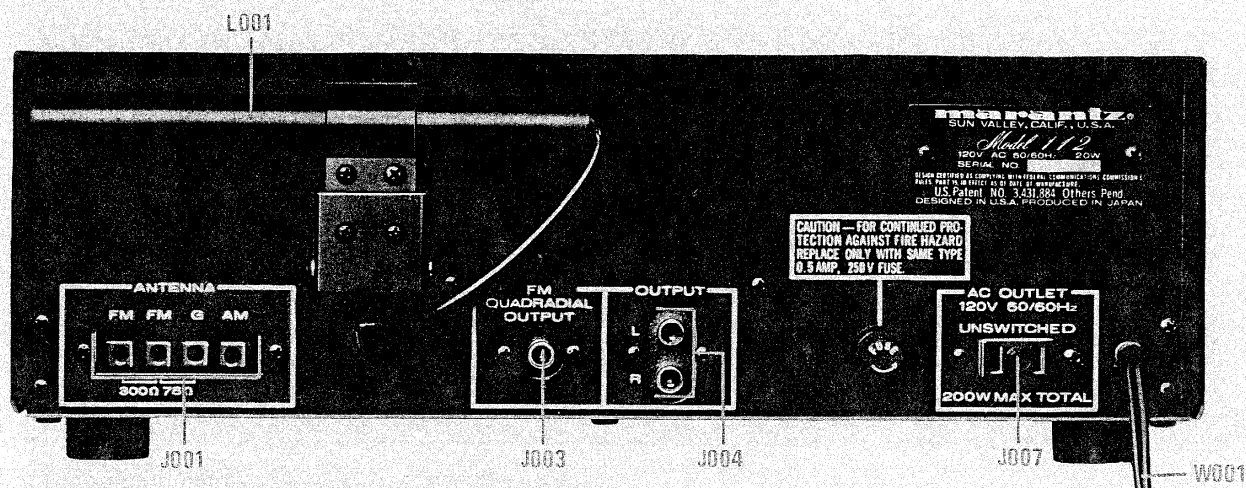


Figure 6. Rear Panel Adjustment and Component Locations

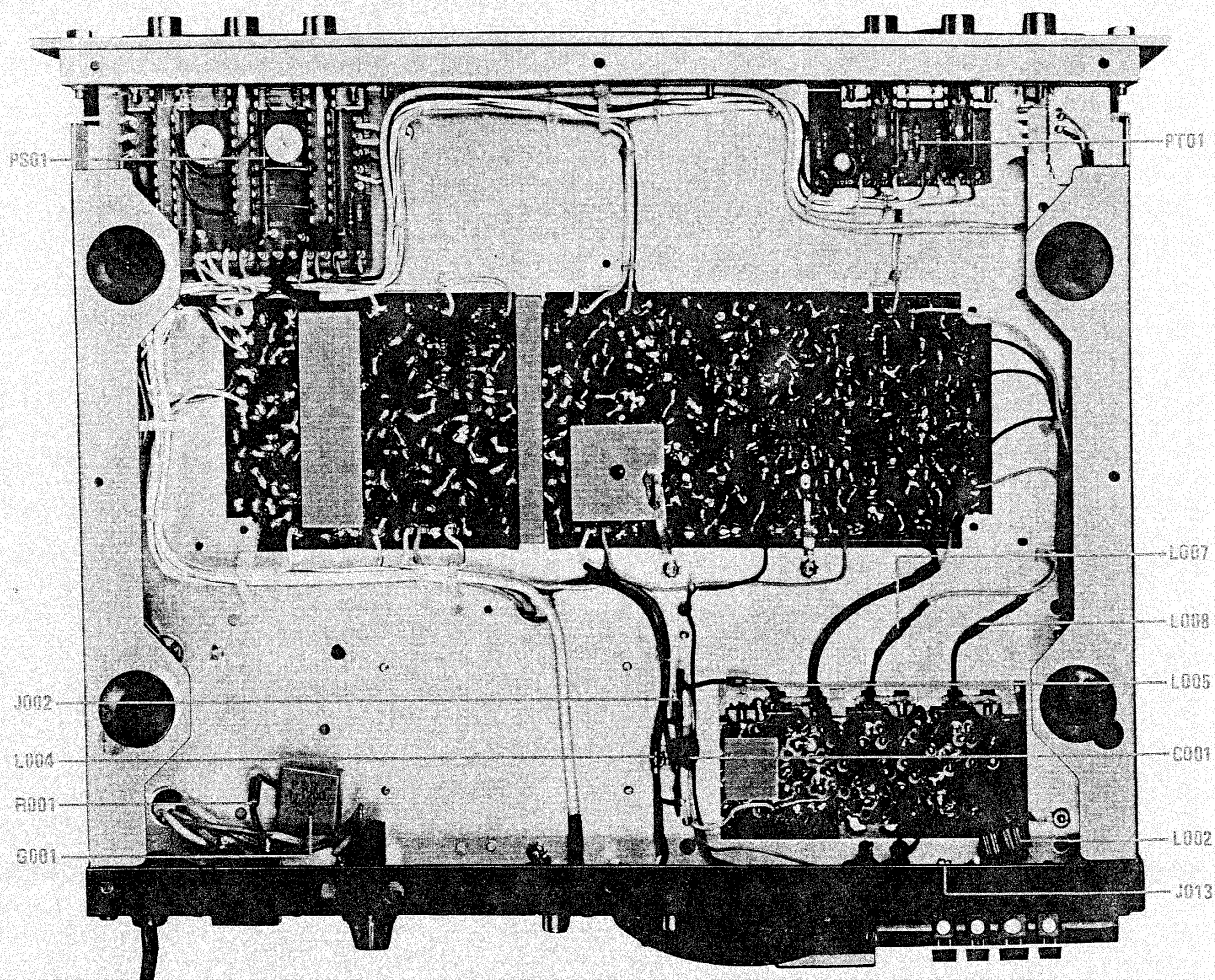


Figure 7. Main Chassis Component Locations (Bottom View)

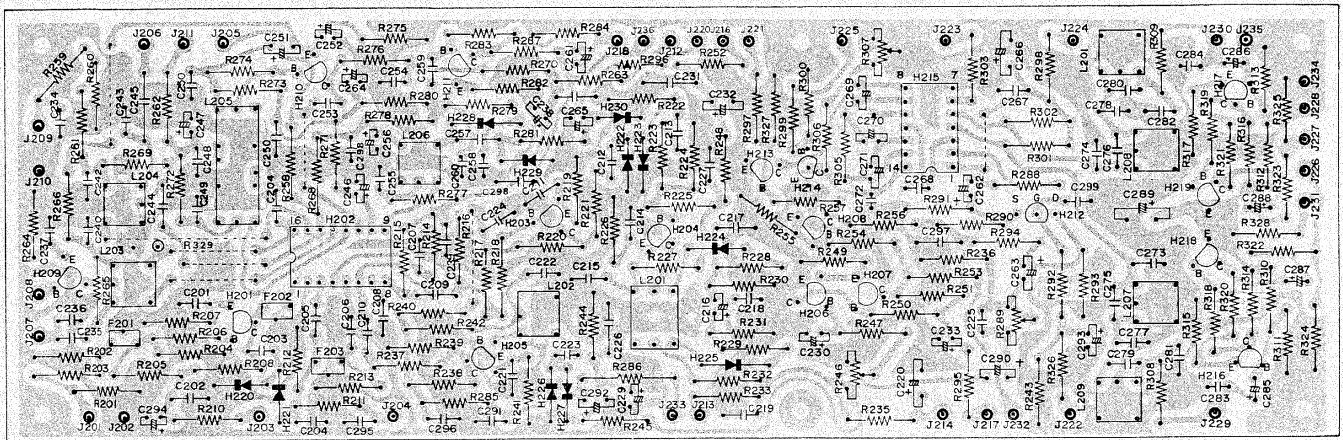


Figure 8. FM/AM Tuner Assembly P200 Component Locations

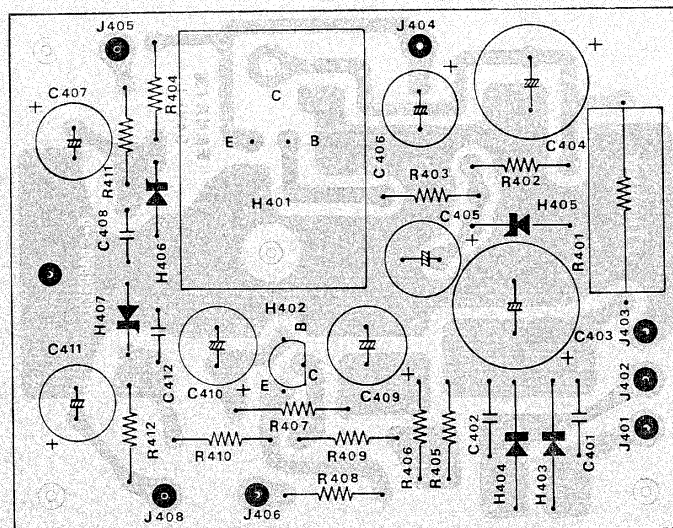


Figure 9. Power Supply Assembly P400 Component Locations

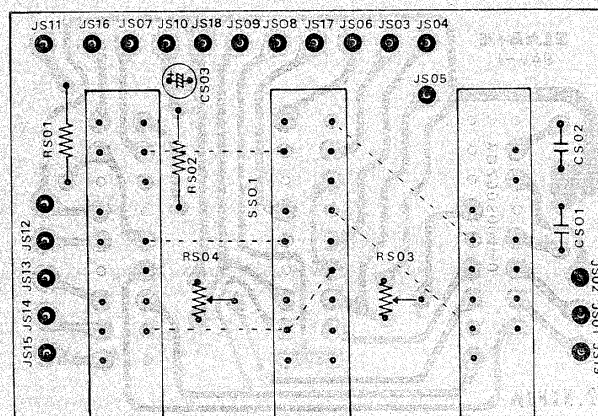
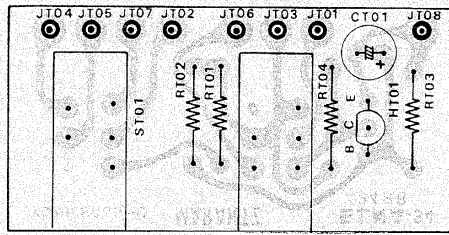


Figure 10. Selector Switch Assembly PS01 Component Locations



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

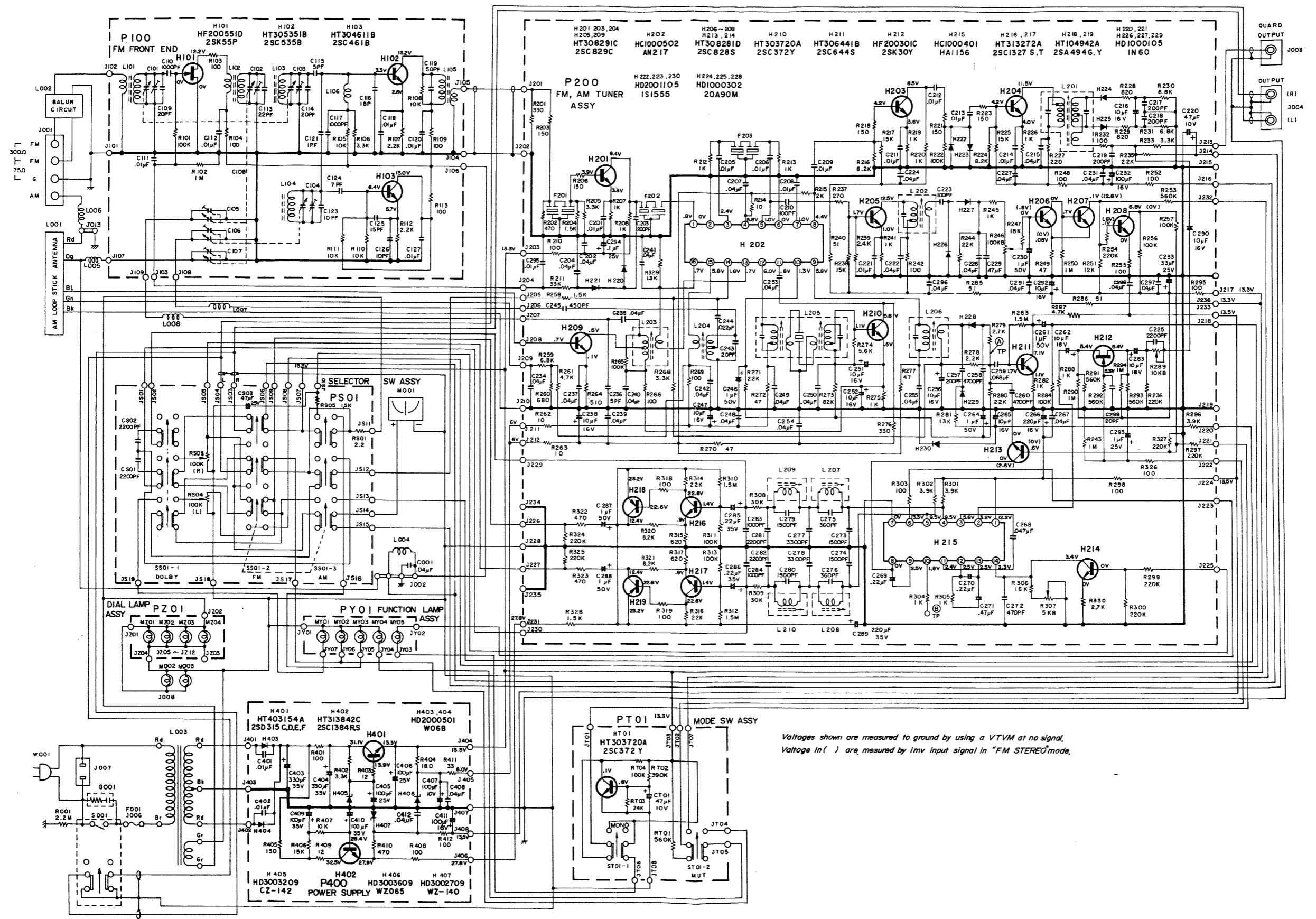


Figure 12. Function Lamp Assembly PY01 Component Locations



Figure 13. Dial Lamp Assembly PZ01 Component Locations

NOTE



Voltages shown are measured to ground by using a VTVM at no signal.
 Voltage in () are measured by imv input signal in "FM STEREO" mode.

Figure 15. Schematic Diagram

7. PARTS LIST

| REF. DESIG. | U | E | PART NO. | DESCRIPTION | REF. DESIG. | U | E | PART NO. | DESCRIPTION |
|-------------|---|---|-----------|--|-------------|---|---|-----------|----------------------|
| A | 1 | 1 | 290806340 | Front Panel Assembly | R214 | 1 | 1 | RT0510014 | 10Ω |
| 0103 | 1 | 1 | 290806301 | Escutcheon | R215 | 1 | 1 | RT0520214 | 2KΩ |
| 0104 | 1 | 1 | 291240101 | Frame | R216 | 1 | 1 | RT0582214 | 8.2KΩ |
| 0105 | 1 | 1 | 290815801 | Window | R217 | 1 | 1 | RT0515314 | 15KΩ |
| 0106 | 6 | 6 | 288625901 | Bush | R218 | 1 | 1 | RT0515114 | 150Ω |
| 0108 | 1 | 1 | 290805301 | Cover | R219 | 1 | 1 | RT0510214 | 1KΩ |
| B | 1 | 1 | 282725740 | Lid Assembly, Top | R220 | 1 | 1 | RT0510214 | 1KΩ |
| 0122 | 1 | 1 | 282725701 | Lid | R221 | 1 | 1 | RT0515114 | 150Ω |
| 0123 | 3 | 3 | 257711807 | Spacer | R222 | 1 | 1 | RT0510414 | 100KΩ |
| C | 1 | 1 | 290816040 | Rear Panel Assembly | R223 | 1 | 1 | RT0515114 | 150Ω |
| 0405 | 1 | 1 | 290816022 | Bracket | R224 | 1 | 1 | RT0582214 | 8.2KΩ |
| 0416 | 1 | 1 | 282125901 | Bush | R225 | 1 | 1 | RT0515314 | 15KΩ |
| 0417 | 2 | 2 | 55060305S | T R Rivet | R226 | 1 | 1 | RT0510214 | 1KΩ |
| D | 1 | 1 | 290810340 | Pointer Assembly | R227 | 1 | 1 | RT0522114 | 220Ω |
| 1303 | 1 | 1 | 290810301 | Pointer | R228 | 1 | 1 | RT0582114 | 820Ω |
| 1304 | 1 | 1 | 290810302 | Pointer | R229 | 1 | 1 | RT0582114 | 820Ω |
| 1305 | 1 | 1 | 290806701 | Cap | R230 | 1 | 1 | RT0568214 | 6.8KΩ |
| M003 | 1 | 1 | IN1008030 | Lamp | R231 | 1 | 1 | RT0568214 | 6.8KΩ |
| E | 1 | 1 | 282715942 | Drum Assembly | R232 | 1 | 1 | RT0510114 | 100Ω |
| 1311 | 1 | 1 | 282715901 | Drum | R233 | 1 | 1 | RT0533214 | 3.3KΩ |
| 1312 | 1 | 1 | 71101569M | Spring | R235 | 1 | 1 | RT0522314 | 22KΩ |
| 1313 | 2 | 2 | 51064019A | Screw | R236 | 1 | 1 | RT0522414 | 220KΩ |
| F | 1 | 1 | 120200640 | Hook Assembly | R237 | 1 | 1 | RT0527114 | 270Ω |
| 1318 | 1 | 1 | 72080802A | String | R238 | 1 | 1 | RT0515314 | 15KΩ |
| 1319 | 1 | 1 | 120225801 | Hook | R239 | 1 | 1 | RT0582214 | 8.2KΩ |
| G | 1 | 1 | 290827340 | Fly Wheel Assembly | R240 | 1 | 1 | RT0551014 | 51Ω |
| 0803 | 1 | 1 | 257727301 | Fly Wheel | R241 | 1 | 1 | RT0510214 | 1KΩ |
| 0804 | 2 | 2 | 257706302 | Escutcheon | R242 | 1 | 1 | RT0510114 | 100Ω |
| 0806 | 1 | 1 | 290811201 | Shaft | R243 | 1 | 1 | RT0510514 | 1MΩ |
| 0808 | 1 | 1 | 53110603E | Hexagon Nut | R244 | 1 | 1 | RT0522314 | 22KΩ |
| 0809 | 1 | 1 | 54020601E | Flat Washer | R245 | 1 | 1 | RT0510214 | 1KΩ |
| P200 | 1 | 1 | YD2908002 | FM/AM TUNER CIRCUIT BOARD-P200 P.W. Board, FM/AM Tuner (Print Only) | R246 | 1 | 1 | RA0104018 | Trimming, .100KΩ (B) |
| | 1 | 1 | ZZ2908002 | P.W. Board Assembly | R247 | 1 | 1 | RT0518314 | 18KΩ |
| | 1 | 1 | ZZ2908802 | P.W. Board Assembly | R248 | 1 | 1 | RT0510114 | 100Ω |
| | | | | P200-RESISTORS All resistors are ±5% and ¼W, unless otherwise indicated. | R249 | 1 | 1 | RT0547014 | 47Ω |
| R201 | 1 | 1 | RT0533114 | 330Ω | R250 | 1 | 1 | RT0510514 | 1MΩ |
| R202 | 1 | 1 | RT0547114 | 470Ω | R251 | 1 | 1 | RT0512314 | 12KΩ |
| R203 | 1 | 1 | RT0515114 | 150Ω | R252 | 1 | 1 | RT0510114 | 100Ω |
| R204 | 1 | 1 | RT0515214 | 1.5KΩ | R253 | 1 | 1 | RT0556414 | 560KΩ |
| R205 | 1 | 1 | RT0533214 | 3.3KΩ | R254 | 1 | 1 | RT0522414 | 220KΩ |
| R206 | 1 | 1 | RT0515114 | 150Ω | R255 | 1 | 1 | RT0510114 | 100Ω |
| R207 | 1 | 1 | RT0510214 | 1KΩ | R256 | 1 | 1 | RT0510414 | 100KΩ |
| R208 | 1 | 1 | RT0510214 | 1KΩ | R257 | 1 | 1 | RT0510414 | 100KΩ |
| R210 | 1 | 1 | RT0510114 | 100Ω | R258 | 1 | 1 | RT0515214 | 1.5KΩ |
| R211 | 1 | 1 | RT0533314 | 33KΩ | R259 | 1 | 1 | RT0568214 | 6.8KΩ |
| R212 | 1 | 1 | RT0510214 | 1KΩ | R260 | 1 | 1 | RT0568114 | 680Ω |
| R213 | 1 | 1 | RT0510214 | 1KΩ | R261 | 1 | 1 | RT0547214 | 4.7KΩ |
| | | | | | R262 | 1 | 1 | RT0510014 | 10Ω |
| | | | | | R263 | 1 | 1 | RT0510014 | 10Ω |
| | | | | | R264 | 1 | 1 | RT0551114 | 510Ω |
| | | | | | R265 | 1 | 1 | RT0510414 | 100KΩ |
| | | | | | R266 | 1 | 1 | RT0510114 | 100Ω |
| | | | | | R267 | 1 | 1 | RT0510214 | 1KΩ |
| | | | | | R268 | 1 | 1 | RT0533214 | 33KΩ |
| | | | | | R269 | 1 | 1 | RT0510114 | 100Ω |
| | | | | | R270 | 1 | 1 | RT0547014 | 47Ω |
| | | | | | R271 | 1 | 1 | RT0522314 | 22KΩ |
| | | | | | R272 | 1 | 1 | RT0547014 | 47Ω |
| | | | | | R273 | 1 | 1 | RT0582314 | 82KΩ |
| | | | | | R274 | 1 | 1 | RT0556214 | 5.6KΩ |
| | | | | | R275 | 1 | 1 | RT0510214 | 1KΩ |

| REF. DESIG. | U | E | PART NO. | DESCRIPTION |
|----------------------------|---|---|-----------|-----------------------|
| R276 | 1 | 1 | RT0533114 | 330Ω |
| R277 | 1 | 1 | RT0547014 | 47Ω |
| R278 | 1 | 1 | RT0522214 | 2.2KΩ |
| R279 | 1 | 1 | RT0527214 | 2.7KΩ |
| R280 | 1 | 1 | RT0522314 | 22KΩ |
| R281 | 1 | 1 | RT0513314 | 13KΩ |
| R282 | 1 | 1 | RT0510214 | 1KΩ |
| R283 | 1 | 1 | RT0515514 | 1.5MΩ |
| R284 | 1 | 1 | RT0510414 | 100KΩ |
| R285 | 1 | 1 | RT0551014 | 51Ω |
| R286 | 1 | 1 | RT0551014 | 51Ω |
| R287 | 1 | 1 | RT0547214 | 4.7KΩ |
| R288 | 1 | 1 | RT0510214 | 1KΩ |
| R289 | 1 | 1 | RA0103025 | Trimming, 10KΩ (B) |
| R290 | 1 | 1 | RT0510514 | 1MΩ |
| R291 | 1 | 1 | RT0556414 | 560KΩ |
| R292 | 1 | 1 | RT0556414 | 560KΩ |
| R293 | 1 | 1 | RT0556414 | 560KΩ |
| R294 | 1 | 1 | RT0510514 | 1MΩ |
| R295 | 1 | 1 | RT0510114 | 100Ω |
| R296 | 1 | 1 | RT0539214 | 3.9KΩ |
| R297 | 1 | 1 | RT0522414 | 220KΩ |
| R298 | 1 | 1 | RT0510114 | 100Ω |
| R299 | 1 | 1 | RT0522414 | 220KΩ |
| R300 | 1 | 1 | RT0522414 | 220KΩ |
| R301 | 1 | 1 | RT0539214 | 3.9KΩ |
| R302 | 1 | 1 | RT0539214 | 3.9KΩ |
| R303 | 1 | 1 | RC1010112 | 100Ω ±10%, 1/4W |
| R304 | 1 | 1 | RT0510214 | 1KΩ |
| R305 | 1 | 1 | RT0510214 | 1KΩ |
| R306 | 1 | 1 | RT0516314 | 16KΩ |
| R307 | 1 | 1 | RA0502020 | Trimming, 5KΩ (B) |
| R308 | 1 | 1 | RT0530314 | 30KΩ |
| R309 | 1 | 1 | RT0530314 | 30KΩ |
| R310 | 1 | 1 | RT0515514 | 1.5MΩ |
| R311 | 1 | 1 | RT0510414 | 100KΩ |
| R312 | 1 | 1 | RT0515514 | 1.5MΩ |
| R313 | 1 | 1 | RT0510414 | 100KΩ |
| R314 | 1 | 1 | RT0522314 | 22KΩ |
| R315 | 1 | 1 | RT0562114 | 620Ω |
| R316 | 1 | 1 | RT0522314 | 22KΩ |
| R317 | 1 | 1 | RT0562114 | 620Ω |
| R318 | 1 | 1 | RT0510114 | 100Ω |
| R319 | 1 | 1 | RT0510114 | 100Ω |
| R320 | 1 | 1 | RT0582214 | 8.2KΩ |
| R321 | 1 | 1 | RT0582214 | 8.2KΩ |
| R322 | 1 | 1 | RT0547114 | 470Ω |
| R323 | 1 | 1 | RT0547114 | 470Ω |
| R324 | 1 | 1 | RT0522414 | 220KΩ |
| R325 | 1 | 1 | RT0522414 | 220KΩ |
| R326 | 1 | 1 | RT0510114 | 100Ω |
| R327 | 1 | 1 | RT0522414 | 220KΩ |
| R328 | 1 | 1 | RT0515214 | 1.5KΩ |
| R329 | 1 | 1 | RT0510214 | 1KΩ |
| R330 | 1 | 1 | RT0527214 | 2.7KΩ |
| P200-SEMICONDUCTORS | | | | |
| H201 | 1 | 1 | HT308291C | Transistor, 2SC829(C) |
| H202 | 1 | 1 | HC1000502 | IC, AN217 |
| H203 | 1 | 1 | HT308291C | Transistor, 2SC829(C) |
| H204 | 1 | 1 | HT308291C | Transistor, 2SC829(C) |

| REF. DESIG. | U | E | PART NO. | DESCRIPTION |
|------------------------|---|---|-----------|----------------------------|
| H205 | 1 | 1 | HT308291C | Transistor, 2SC829(C) |
| H206 | 1 | 1 | HT308281D | Transistor, 2SC828(S) |
| H207 | 1 | 1 | HT308281D | Transistor, 2SC828(S) |
| H208 | 1 | 1 | HT308281D | Transistor, 2SC828(S) |
| H209 | 1 | 1 | HT308291C | Transistor, 2SC829(C) |
| H210 | 1 | 1 | HT303720A | Transistor, 2SC372(Y) |
| H211 | 1 | 1 | HT306441B | Transistor, 2SC644 (S) |
| H212 | 1 | 1 | HF200301C | FET, 2SK30 (Y) |
| H213 | 1 | 1 | HT308281D | Transistor, 2SC828 (S) |
| H214 | 1 | 1 | HT308281D | Transistor, 2SC828 (S) |
| H215 | 1 | 1 | HC1000401 | IC, HA1156 |
| H216 | 1 | 1 | HT313272A | Transistor, 2SC1327S or T |
| H217 | 1 | 1 | HT313272A | Transistor, 2SC1327S or T |
| H218 | 1 | 1 | HT104942A | Transistor, 2SA494 G or Y |
| H219 | 1 | 1 | HT104942A | Transistor, 2SA494 G or Y |
| H220 | 1 | 1 | HD1000105 | Diode, IN60 |
| H221 | 1 | 1 | HD1000105 | Diode, IN60 |
| H222 | 1 | 1 | HD2001105 | Diode, IS1555 |
| H223 | 1 | 1 | HD2001105 | Diode, IS1555 |
| H224 | 1 | 1 | HD1000302 | Diode, 20A90M |
| H225 | 1 | 1 | HD1000302 | Diode, 20A90M |
| H226 | 1 | 1 | HD1000105 | Diode, IN60 |
| H227 | 1 | 1 | HD1000105 | Diode, IN60 |
| H228 | 1 | 1 | HD1000302 | Diode, 20A90M |
| H229 | 1 | 1 | HD1000105 | Diode, IN60 |
| H230 | 1 | 1 | HD2001105 | Diode, IS1555 |
| P200-CAPACITORS | | | | |
| C201 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C202 | 1 | 1 | DK1840301 | Ceramic, 0.04μF +100%, -0% |
| C203 | 1 | 1 | DD1620101 | Ceramic, 200PF ±10%SL |
| C204 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C205 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C206 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C207 | 1 | 1 | DK1840301 | Ceramic, 0.04μF +100%, -0% |
| C208 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C209 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C210 | 1 | 1 | DD1610101 | Ceramic, 100PF ±10% SL |
| C211 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C212 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C213 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C214 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C215 | 1 | 1 | DK1840301 | Ceramic, 0.04μF +100%, -0% |
| C216 | 1 | 1 | EA1060169 | Electroly, 10μF, 16V |
| C217 | 1 | 1 | DD1620101 | Ceramic, 200PF ±10% |
| C218 | 1 | 1 | DD1620101 | Ceramic, 200PF ±10% |
| C219 | 1 | 1 | DD1620101 | Ceramic, 200PF ±10% |
| C220 | 1 | 1 | EA4760109 | Electroly, 47μF 10V |
| C221 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C222 | 1 | 1 | DK1840301 | Ceramic, 0.04μF +100%, -0% |
| C223 | 1 | 1 | DD1610101 | Ceramic, 100PF ±10% |
| C224 | 1 | 1 | DK1840301 | Ceramic, 0.04μF +100%, -0% |
| C225 | 1 | 1 | DF1722201 | Film, 2200PF ±20% |
| C226 | 1 | 1 | DK1840301 | Ceramic, 0.04μF +100%, -0% |
| C227 | 1 | 1 | DK1840301 | Ceramic, 0.04μF +100%, -0% |
| C229 | 1 | 1 | EA4740509 | Electroly, 0.47μF, 50V |
| C230 | 1 | 1 | EA1050509 | Electroly, 1μF, 50V |
| 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 |
|-------------|---|---|-----------|-----------------------------|
| C236 | 1 | 1 | DD1105001 | Ceramic, 5PF ±0.5PF |
| C237 | 1 | 1 | DF1740301 | Film, 0.04μF ±20% |
| C238 | 1 | 1 | EA1060169 | Electroly, 10μF, 16V |
| C239 | 1 | 1 | DF1740301 | Film, 0.04μF ±20% |
| C240 | 1 | 1 | DF1740301 | Film, 0.04μF ±20% |
| C241 | 1 | 1 | DF1740301 | Film, 0.04μF ±20% |
| C242 | 1 | 1 | DF1740301 | Film, 0.04μF ±20% |
| C243 | 1 | 1 | DD1620001 | Ceramic, 20PF ±10% |
| C244 | 1 | 1 | DF1722301 | Film, 0.022μF ±20% |
| C245 | 1 | 1 | DF6545101 | Film, 450PF ±5% |
| C246 | 1 | 1 | EA1050509 | Electroly, 1μF, 50V |
| C247 | 1 | 1 | EA1060169 | Electroly, 10μF, 16V |
| C248 | 1 | 1 | DF1740301 | Film, 0.04μF ±20% |
| C249 | 1 | 1 | DF1740301 | Film, 0.04μF ±20% |
| C250 | 1 | 1 | DF1740301 | Film, 0.04μF ±20% |
| C251 | 1 | 1 | EA1060169 | Electroly, 10μF, 16V |
| C252 | 1 | 1 | EA1060169 | Electroly, 10μF, 16V |
| C253 | 1 | 1 | DF1740301 | Film, 0.04μF ±20% |
| C254 | 1 | 1 | DF1740301 | Film, 0.04μF ±20% |
| C255 | 1 | 1 | DF1740301 | Film, 0.04μF ±20% |
| C256 | 1 | 1 | EA1060169 | Electroly, 10μF, 16V |
| C257 | 1 | 1 | DD1620101 | Ceramic, 200PF ±10% SL |
| C258 | 1 | 1 | DF1747201 | Film, 4700PF ±20% |
| 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 |
| C263 | 1 | 1 | EA1060169 | Electroly, 10μF, 16V |
| C264 | 1 | 1 | EA1050509 | Electroly, 1μF, 50V |
| C265 | 1 | 1 | EA1060169 | Film, 10μF, 16V |
| C266 | 1 | 1 | EA2270169 | Electroly, 220μF 16V |
| C267 | 1 | 1 | DK1840301 | Ceramic, 0.04μF +100%, -0% |
| C268 | 1 | 1 | DF1747301 | Film, 0.047μF ±20% |
| C269 | 1 | 1 | EQ2240501 | Electroly, 0.22μF ±20% |
| C270 | 1 | 1 | EQ2240501 | Electroly, 0.22μF ±20% |
| C271 | 1 | 1 | EQ4740501 | Electroly, 0.47μF ±20% |
| C272 | 1 | 1 | DF5547101 | Film, 470PF ±5% |
| C273 | 1 | 1 | DF1615205 | Film, 1500PF ±10% |
| C274 | 1 | 1 | DF1615205 | Film, 1500PF ±10% |
| C275 | 1 | 1 | DD1536101 | Ceramic, 360PF ±5% |
| C276 | 1 | 1 | DD1536101 | Ceramic, 360PF ±5% |
| C277 | 1 | 1 | DF1633205 | Film, 3300PF ±10% |
| C278 | 1 | 1 | DF1633205 | Film, 3300PF ±10% |
| C279 | 1 | 1 | DF1515205 | Film, 1500PF ±5% |
| C280 | 1 | 1 | DF1515205 | Film, 1500PF ±5% |
| C281 | 1 | 1 | DF1622205 | Film, 2200PF ±10% |
| C282 | 1 | 1 | DF1622205 | Film, 2200PF ±10% |
| C283 | 1 | 1 | DF1510205 | Film, 1000PF ±5% |
| C284 | 1 | 1 | DF1510205 | Film, 1000PF ±5% |
| C285 | 1 | 1 | EV2240351 | Electroly, 0.22μF ±20%, 35V |
| C286 | 1 | 1 | EV2240351 | Electroly, 0.22μF ±20%, 35V |
| C287 | 1 | 1 | EA1050509 | Electroly, 1μF, 50V |
| C288 | 1 | 1 | EA1050509 | Electroly, 1μF, 50V |
| C289 | 1 | 1 | EA2270359 | Electroly, 220μF, 35V |
| C290 | 1 | 1 | EA1060169 | Electroly, 10μF, 16V |
| C291 | 1 | 1 | DK1840301 | Ceramic, 0.04μF +100%, -0% |
| C292 | 1 | 1 | EA1060169 | Electroly, 10μF, 16V |
| C293 | 1 | 1 | EV1040251 | Electroly, 0.1μF, 25V |
| C294 | 1 | 1 | EA1060169 | Electroly, 10μF, 16V |
| C295 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C296 | 1 | 1 | DK1840301 | Ceramic, 0.04μF +100%, -0% |

| REF. DESIG. | U | E | PART NO. | DESCRIPTION |
|---|---|---|-----------|--|
| C297 | 1 | 1 | DK1840301 | Ceramic, 0.04μF +100%, -0% |
| C298 | 1 | 1 | DK1840301 | Ceramic, 0.04μF +100%, -0% |
| C299 | 1 | 1 | DD1620001 | Ceramic, 20PF ±10% |
| P200-MISCELLANEOUS | | | | |
| F201 | 1 | 1 | FF1107052 | Ceramic Filter, CFS 10.7M |
| F202 | 1 | 1 | FF1107052 | Ceramic Filter, CFS 10.7M |
| F203 | 1 | 1 | FF1107052 | Ceramic Filter, CFS 10.7M |
| L201 | 1 | 1 | LI1401623 | IFT, FM |
| L202 | 1 | 1 | LI1015602 | IFT, FM |
| L203 | 1 | 1 | LA1001017 | Coil, AM RF |
| L204 | 1 | 1 | LO1001042 | Coil, AM OSC |
| L205 | 1 | 1 | LI1028002 | IFT, AM |
| L206 | 1 | 1 | LI1001048 | IFT, AM |
| L207 | 1 | 1 | LS1029004 | MPX Coil, 56mH |
| L208 | 1 | 1 | LS1029004 | MPX Coil, 56mH |
| L209 | 1 | 1 | LS1029005 | MPX Coil, 43mH |
| L210 | 1 | 1 | LS1029005 | MPX Coil, 43mH |
| L205 | 1 | 1 | LI1028003 | IFT, AM |
| 1211 | 1 | 1 | 290810903 | Shield |
| 1212 | 1 | 1 | 290810902 | Shield |
| J201 | 1 | 1 | YP1000113 | Plug |
| J235 | 1 | 1 | | |
| GENERAL MISCELLANEOUS | | | | |
| L007 | 1 | 1 | LC1332002 | Choke Coil |
| L008 | 1 | 1 | LC1332002 | Choke Coil |
| POWER SUPPLY CIRCUIT BOARD -P400 | | | | |
| P400 | 1 | 1 | YD2908003 | P. W. Board, Power Supply (Print Only) |
| | 1 | 1 | ZZ2908003 | P. W. Board Assembly |
| P400-RESISTORS | | | | |
| R401 | 1 | 1 | GS1010105 | 100Ω ±10%, 5W |
| R402 | 1 | 1 | RC1033212 | 3.3KΩ ±10%, ½W |
| R403 | 1 | 1 | RC1012012 | 12Ω ±10%, ½W |
| R404 | 1 | 1 | RC1018112 | 180Ω ±10%, ½W |
| R405 | 1 | 1 | RC1015112 | 150Ω ±10%, ½W |
| R406 | 1 | 1 | RC1015312 | 15KΩ ±10%, ½W |
| R407 | 1 | 1 | RC1010312 | 10KΩ ±10%, ½W |
| R408 | 1 | 1 | RC1010112 | 100Ω ±10%, ½W |
| R409 | 1 | 1 | RC1012012 | 12Ω ±10%, ½W |
| R410 | 1 | 1 | RC1047112 | 470Ω ±10%, ½W |
| R412 | 1 | 1 | RC1010112 | 100Ω ±10%, ½W |
| R411 | 1 | 1 | RC1033012 | 33Ω ±10%, ½W |
| P400-CAPACITORS | | | | |
| C401 | 1 | 1 | DK1810351 | Ceramic, 0.01μF +100%, -0%, 50V |
| C402 | 1 | 1 | DK1810351 | Ceramic, 0.01μF +100%, -0%, 50V |
| C403 | 1 | 1 | EA3370509 | Electroly, 330μF, 50V |
| C404 | 1 | 1 | EA3370509 | Electroly, 330μF, 50V |
| C405 | 1 | 1 | EA1070259 | Electroly, 100μF, 25V |
| C406 | 1 | 1 | EA1070259 | Electroly, 100μF, 25V |
| C407 | 1 | 1 | EA1070109 | Electroly, 100μF, 10V |
| C408 | 1 | 1 | DK1840301 | Ceramic, 0.04μF +100%, -0% |
| C409 | 1 | 1 | EA1070359 | Electroly, 100μF, 35V |
| C410 | 1 | 1 | EA1070359 | Electroly, 100μF, 35V |
| C411 | 1 | 1 | EA1070169 | Electroly, 100μF, 16V |

| REF. DESIG. | U | E | PART NO. | DESCRIPTION | REF. DESIG. | U | E | PART NO. | DESCRIPTION |
|-------------|---|---|-----------|------------------------------------|-------------|---|---|-----------|---|
| C412 | 1 | 1 | DK1840301 | Cramic, 0.04 μ F +100%, -0% | PY01 | 1 | 1 | YD2908006 | P. W. Board, Function Lamp (Print Only) |
| | | | | | | 1 | 1 | ZZ2908006 | P. W. Board Assembly |
| | | | | P400-SEMICONDUCTORS | | | | | PY01-MISCELLANEOUS |
| H401 | 1 | 1 | HT403154A | Transistor, 2SD315 (C,D,E,F) | MY01 | | | | |
| H402 | 1 | 1 | HT313842C | Transistor, 2SC1384 R or S | | 1 | 1 | IN1006301 | Lamp |
| H403 | 1 | 1 | HD2000501 | Diode, W 06B | MY04 | | | | |
| H404 | 1 | 1 | HD2000501 | Diode, W 06B | MY05 | 1 | 1 | IN1012011 | Lamp |
| H405 | 1 | 1 | HD3003209 | Diode, CZ-142 | JY01 | | | | |
| H406 | 1 | 1 | HD3003609 | Diode, WZ065 | | 1 | 1 | YP1000113 | Plug |
| H407 | 1 | 1 | HD3002709 | Diode, WZ-140 | JY06 | | | | |
| | | | | P400-MISCELLANEOUS | | | | | GENERAL MISCELLANEOUS |
| J401 | | | | | | | | | |
| J408 | 1 | 1 | YP1000113 | Plug | 0726 | 1 | 1 | 290805150 | Guide K |
| | | | | | 0910 | 1 | 1 | 290826251 | Pulley K |
| 1111 | 1 | 1 | 273026702 | Heat Sink, Power Transistor | 0914 | 1 | 1 | 51100306A | B. H. M. Screw B 3 x 6 |
| 1112 | 2 | 2 | 53110303E | Hexagon Nut | M001 | 1 | 1 | IM1104208 | DC Meter, FM/AM |
| | | | | GENERAL MISCELLANEOUS | 0630 | 1 | 1 | 288610701 | Sheet |
| 0603 | 1 | 1 | 290816050 | Bracket K | 0622 | 1 | 1 | 285427101 | Holder |
| 0621 | 1 | 1 | 285427401 | Reflector | 0624 | 1 | 1 | 51570306B | P. H. Tapt Screw P 3 x 6 ST |
| 0625 | 1 | 1 | 51480306A | B. H. M. Screw F | M002 | 1 | 1 | IN1008007 | Lamp |
| 0627 | 2 | 2 | 51570306B | P. H. Tapt Screw P 3 x 6 ST | J008 | 1 | 1 | YJ0800019 | Socket |
| 0628 | 2 | 2 | 54050300R | T. L. Washer OR | 0616 | 1 | 1 | 121000501 | Clamper |
| 0708 | 1 | 1 | 287105302 | Cover | 0403 | 1 | 1 | 290816001 | Bracket |
| 0713 | 1 | 1 | 290820101 | Partitioner | 0409 | 1 | 1 | 289611801 | Spacer |
| 0714 | 2 | 2 | 51570306B | P. H. Tapt Screw P 3 x 6 ST | 0410 | 2 | 2 | 51100308S | B. H. M. Screw B 3 x 8 |
| 0726 | 1 | 1 | 290805150 | Guide K | 0411 | 2 | 2 | 53110303A | Hexagon Nut |
| 0729 | 4 | 4 | 51042606A | F. H. M. Screw F 2.6 x 6 | 0413 | 1 | 1 | 145525903 | Bush |
| | | | | | 0414 | 1 | 1 | 284906702 | Cap |
| 0730 | 2 | 2 | 53112603A | Hexagon Nut | 0419 | 2 | 2 | 51060316A | P. H. M. Screw P 3 x 16 |
| 0903 | 1 | 1 | 290826250 | Pulley K | 0420 | 2 | 2 | 53110303A | Hexagon Nut |
| 0907 | 2 | 2 | 51100306A | B. H. M. Screw B 3 x 6 | 0426 | 2 | 2 | 51100306S | B. H. M. Screw B 3 x 6 |
| 0917 | 2 | 2 | 127126201 | Pulley | 0427 | 2 | 2 | 53110303A | Hexagon Nut |
| 0918 | 2 | 2 | 263711203 | Shaft | 0429 | 2 | 2 | 51100306S | B. H. M. Screw B 3 x 6 |
| 0610 | 1 | 1 | 290827401 | Reflector | 0430 | 2 | 2 | 53110303A | Hexagon Nut |
| 0612 | 1 | 1 | 290827101 | Holder | 0432 | 2 | 2 | 51100306S | B. H. M. Screw B 3 x 6 |
| 0614 | 2 | 2 | 51100308S | B. H. M. Screw B 3 x 8 | 0433 | 2 | 2 | 53110303A | Hexagon Nut |
| 0615 | 2 | 2 | 53110303A | Hexagon Nut | 0516 | 3 | 3 | 51100306S | B. H. M. Screw B 3 x 6 |
| 0617 | 2 | 2 | 51570306B | P. H. Tapt Screw P 3x6 ST | 0519 | 1 | 1 | 145525903 | Bush |
| 0618 | 2 | 2 | 51480306A | B. H. M. Screw F | G001 | 1 | 1 | BF1040002 | Printed Compo. |
| | | | | DIAL LAMP BOARD-PZ01 | L002 | 1 | 1 | LB3007526 | Balun Coil |
| PZ01 | 1 | 1 | YD2908007 | P.W. Board, Dial Lamp (Print Only) | L006 | 1 | 1 | LC1154004 | Choke Coil, 150 μ H |
| | | | | | F001 | 1 | 1 | FS1005009 | Fuse, 0.5A 250V (UL) |
| | | | | | J001 | 1 | 1 | YT0304009 | Terminal, Ant. |
| | | | | PZ01-MISCELLANEOUS | J003 | 1 | 1 | YT0201009 | Terminal, Quadradial Output |
| MZ01 | | | | | J004 | 1 | 1 | YT0202011 | Terminal, Output |
| MZ04 | 1 | 1 | IN1008007 | Lamp, Dial Illumination | J006 | 1 | 1 | YJ0800012 | Socket, Fuse Holder |
| | | | | | J007 | 1 | 1 | YJ0400048 | Socket, AC Outlet |
| JZ01 | | | | | J013 | 1 | 1 | YL0102003 | Terminal, 2P |
| JZ04 | 1 | 1 | YP1000113 | Plug | W001 | 1 | 1 | YC0240010 | AC Cord |
| | | | | | W001 | 1 | 1 | YC0190003 | AC Cord |
| JZ05 | | | | | C002 | 1 | 1 | DF1756351 | Film Cap., 0.056 μ F \pm 20% |
| JZ12 | 1 | 1 | YJ0800017 | Socket | L001 | 1 | 1 | LF1120038 | Ant. Coil, AM |
| | | | | FUNCTION LAMP BOARD-PY01 | 0503 | 1 | 1 | 257816052 | Bracket K |
| | | | | | 0508 | 1 | 1 | 281927103 | Holder, Ant. |
| | | | | | 0509 | 2 | 2 | 51100310S | B. H. M. Screw B 3 x 10 |
| | | | | | 0510 | 2 | 2 | 53110303E | Hexagon Nut |
| | | | | | 0512 | 2 | 2 | 51100308S | B. H. M. Screw B 3 x 8 |
| | | | | | 0513 | 2 | 2 | 53110303E | Hexagon Nut |

| REF. DESIG. | U | E | PART NO. | DESCRIPTION |
|--------------------------------------|---|---|-----------|---|
| 0425 | 1 | 1 | 138200503 | Clamper |
| 1226 | 1 | 1 | 62030039W | Lug |
| R001 | 1 | | GT0522512 | Resistor, 2.2M Ω \pm 5%, $\frac{1}{2}$ W |
| 0703 | 1 | 1 | 290830201 | Dial |
| 0707 | 1 | 1 | 282705302 | Cover |
| 0812 | 1 | 1 | 290810401 | Retainer |
| 0813 | 1 | 1 | 290810601 | Bearing |
| 0815 | 2 | 2 | 51040306E | F. H. M. Screw F 3 x 6 |
| 0827 | 1 | 1 | 51064019A | Screw |
| 1116 | 1 | 1 | 290812002 | Insulator |
| 1117 | 5 | | 54060300R | T. L. Washer IR |
| 1118 | 4 | | 51570312B | P. H. Tapt Screw P 3 x 12 |
| W004 | 1 | | YB0007001 | Wire Material |
| W005 | 1 | | YB0007001 | Wire Material |
| W006 | 1 | | YB0027001 | Wire Material |
| J009 | 1 | | YL0106004 | Terminal |
| 1121 | 1 | | 285216006 | Bracket |
| 1123 | 3 | | 51062606A | P. H. M. Screw P 2.6 x 6 |
| J010 | 1 | | YJ0800009 | Socket, Fuse Holder |
| J011 | 1 | | YJ0800009 | Socket, Fuse Holder |
| J012 | 1 | | YJ0800009 | Socket, Fuse Holder |
| 1127 | 1 | 1 | 138200503 | Clamper |
| 1325 | 1 | 1 | 138200503 | Clamper |
| 4236 | 1 | 1 | 287100501 | Clamper |
| J002 | 1 | 1 | YL0104001 | Terminal, Ant. |
| C001 | 1 | 1 | DK1840301 | Ceramic Cap., 0.04 μ F, +100%, -0% |
| L004 | 1 | 1 | LC1332002 | Choke Coil, 3.3 μ H |
| L005 | 1 | 1 | LC1332002 | Choke Coil, 3.3 μ H |
| SELECTOR SWITCH CIRCUIT BOARD | | | | |
| -PS01 | | | | |
| PS01 | 1 | 1 | YD2908004 | P. W. Board, Selector Switch (Print Only) |
| | 1 | | ZZ2908004 | P. W. Board Assembly |
| | 1 | | ZZ2908804 | P. W. Board Assembly |
| PS01-RESISTORS | | | | |
| RS01 | 1 | 1 | RC1002212 | 2.2 Ω \pm 10%, $\frac{1}{2}$ W |
| RS02 | 1 | 1 | RT0515214 | 1.5K Ω \pm 5%, $\frac{1}{2}$ W |
| RS03 | 1 | 1 | RA0104018 | Trimming, 100K Ω (B) |
| RS04 | 1 | 1 | RA0104018 | Trimming, 100K Ω (B) |
| PS01-CAPACITORS | | | | |
| CS01 | 1 | | DF1522205 | Film, 2200PF \pm 5%, 50V |
| CS02 | 1 | | DF1522205 | Film, 2200PF \pm 5%, 50V |
| CS03 | 1 | 1 | EM4740251 | Electroly, 0.47 μ F, 25V |
| CS01 | 1 | | DF1510205 | Film, 1000PF \pm 5% |
| CS02 | 1 | | DF1510205 | Film, 1000PF \pm 5% |
| PS01-MISCELLANEOUS | | | | |
| SS01 | 1 | 1 | SP0603008 | Pushswitch |
| JS01 | ? | 1 | YP1000113 | Plug |
| JS20 | | | | |

| REF. DESIG. | U | E | PART NO. | DESCRIPTION |
|---------------------------------------|---|---|-----------|---|
| MODE SWITCH CIRCUIT BOARD-PT01 | | | | |
| PT01 | 1 | 1 | YD2908005 | P. W. Board, Mode Switch (Print Only) |
| | 1 | 1 | ZZ2908005 | P. W. Board Assembly |
| PT01-MISCELLANEOUS | | | | |
| RT01 | 1 | 1 | RT0556414 | Resistor, 560K Ω \pm 5%, $\frac{1}{4}$ W |
| RT02 | 1 | 1 | RT0539414 | Resistor, 390K Ω \pm 5%, $\frac{1}{4}$ W |
| RT03 | 1 | 1 | RT0524314 | Resistor, 24K Ω \pm 5%, $\frac{1}{4}$ W |
| RT04 | 1 | 1 | RT0510414 | Resistor, 100K Ω \pm 5%, $\frac{1}{4}$ W |
| CT01 | 1 | 1 | EA4760109 | Electroly Cap., 47 μ F 10V |
| HT01 | 1 | 1 | HT3037204 | Transistor, 2SC372 (Y) |
| ST01 | 1 | 1 | SP0202014 | Pushswitch |
| JT01 | | | | |
| ? | 1 | 1 | YP1000113 | Plug |
| JT08 | | | | |
| GENERAL MISCELLANEOUS | | | | |
| S001 | 1 | 1 | SP0301003 | Pushswitch |
| 0203 | 4 | 4 | 293205701 | Lug |
| 0204 | 4 | 4 | 51490410S | B. H. M. Screw F.S. |
| 0332 | 2 | | 951061111 | Label, Fuse (0.3A) |
| 0333 | 1 | | 951061103 | Label, Fuse (3A) |
| 0335 | 1 | 1 | 290886101 | Label, Marantz |
| 0531 | 6 | 6 | 51100306S | B. H. M. Screw B 3 x 6 |
| 0831 | 1 | 1 | 290810602 | Bearing |
| 0832 | 2 | 2 | 51040306E | F. H. M. Screw F 3 x 6 |
| 1003 | 1 | 1 | 290810550 | Chassis K |
| 1013 | 2 | 2 | 290810101 | Support |
| 1014 | 2 | 2 | 54040402N | Spring Washer |
| 1018 | 2 | 2 | 51100306A | B. H. M. Screw B 3 x 6 |
| 1019 | 2 | 2 | 51100306A | B. H. M. Screw B 3 x 6 |
| 1020 | 2 | 2 | 51100306A | B. H. M. Screw B 3 x 6 |
| 1023 | 4 | 4 | 51570308B | P. H. Tapt Screw P 3 x 6 ST |
| 1026 | 2 | 2 | 289610401 | Retainer |
| 1027 | 2 | 2 | 51570410B | P. H. Tapt Screw P 4 x 10 ST |
| 1028 | 1 | 1 | 290812001 | Insulator |
| 1029 | 2 | 2 | 54040402N | Spring Washer |
| 1103 | 4 | 4 | 51570306S | P. H. Tapt Screw P 3 x 6 ST |
| 1104 | 2 | 2 | 51060306S | P. H. M. Screw P 3 x 6 |
| 1105 | 1 | 1 | 288116003 | Bracket |
| 1109 | 4 | 4 | 51100306S | P. H. M. Screw P 3 x 6 |
| 1122 | 2 | | 51570306B | P. H. Tapt Screw P 3 x 6 ST |
| 1126 | 4 | 4 | 288600506 | Clamper |
| 1128 | 1 | 1 | 288600504 | Clamper |
| 1129 | 1 | 1 | 51570306B | P. H. Tapt Screw P 3 x 6 ST |
| 1131 | 4 | 4 | 288600506 | Clamper |
| 1132 | 1 | 1 | 288600504 | Clamper |
| 1135 | 1 | 1 | 288600506 | Clamper |
| 1203 | 2 | 2 | 51100304A | B. H. M. Screw B 3 x 4 |
| 1204 | 4 | 4 | 51570306B | P. H. Tapt Screw P 3 x 6 ST |
| 1216 | 1 | 1 | 138200503 | Clamper |
| 1217 | 1 | 1 | 53110303A | Hexagon Nut |
| 1218 | 1 | 1 | 54050300R | T. L. Washer OR |
| 1221 | 1 | 1 | 138200503 | Clamper |
| 1222 | 1 | 1 | 51570306B | P. H. Tapt Screw P 3 x 6 ST |
| 1223 | 1 | 1 | 54050300R | T. L. Washer OR |
| 1227 | 1 | 1 | 51570306B | P. H. Tapt Screw P 3 x 6 ST |
| 1231 | 1 | 1 | 51570306B | P. H. Tapt Screw P 3 x 6 ST |
| 1232 | 1 | 1 | 54050300R | T. L. Washer OR |
| 1332 | 2 | 2 | 121000501 | Clamper |
| 1333 | 2 | 2 | 51570306B | P. H. Tapt Screw P 3 x 6 ST |
| 1334 | 2 | 2 | 54050300R | T. L. Washer OR |

| REF. DESIG. | U | E | PART NO. | DESCRIPTION |
|-------------|---|---|-----------|--|
| A001 | 1 | 1 | AV0120202 | FM Front End Assembly |
| | | | | FM FRONT END CIRCUIT BOARD—P100 |
| P100 | 1 | 1 | YD2908001 | P. W. Board, FM Front End (Print Only) |
| | 1 | 1 | ZZ2908001 | P. W. Board Assembly |
| | | | | P100—RESISTORS All resistors are ±5% and ¼W. |
| R101 | 1 | 1 | RT0510414 | 100KΩ |
| R102 | 1 | 1 | RT0510514 | 1MΩ |
| R103 | 1 | 1 | RT0510114 | 100Ω |
| R104 | 1 | 1 | RT0510114 | 100Ω |
| R105 | 1 | 1 | RT0510314 | 10KΩ |
| R106 | 1 | 1 | RT0533214 | 3.3KΩ |
| R107 | 1 | 1 | RT0522214 | 2.2KΩ |
| R108 | 1 | 1 | RT0510314 | 10KΩ |
| R109 | 1 | 1 | RT0510114 | 100Ω |
| R110 | 1 | 1 | RT0510314 | 10KΩ |
| R111 | 1 | 1 | RT0510314 | 10KΩ |
| R112 | 1 | 1 | RT0522214 | 2.2KΩ |
| R113 | 1 | 1 | RT0510114 | 100Ω |
| | | | | P100—CAPACITORS |
| C101 | 1 | 1 | CT1120003 | Trimming, 12PF |
| C102 | 1 | 1 | CT1120003 | Trimming, 12PF |
| C103 | 1 | 1 | CT1120003 | Trimming, 12PF |
| C104 | 1 | 1 | CT1120003 | Trimming, 12PF |
| C108 | 1 | 1 | CA4330001 | Variable, AM3G, FM4G |
| C109 | 1 | 1 | DD1620001 | Ceramic, 20PF ±10% |
| C110 | 1 | 1 | DK1710201 | Ceramic, 1000PF ±20% |
| C111 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C112 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C113 | 1 | 1 | DD1522001 | Ceramic, 22PF ±5% |
| C114 | 1 | 1 | DD1620001 | Ceramic, 20PF ±10% |
| C115 | 1 | 1 | DD1205001 | Ceramic, 5PF ±0.5PF |
| C116 | 1 | 1 | DD1518001 | Ceramic, 18PF ±5% SL |
| C117 | 1 | 1 | DK1710201 | Ceramic, 1000PF ±20% |
| C118 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C119 | 1 | 1 | DD1650001 | Ceramic, 50PF ±10% |
| C120 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C121 | 1 | 1 | DD1001003 | Ceramic, 1PF ±0.25PF CH |
| C122 | 1 | 1 | DD1615009 | Ceramic, 15PF (RH) |
| C123 | 1 | 1 | DD1610004 | Ceramic, 10PF (RH) |
| C124 | 1 | 1 | DD1207005 | Ceramic, 7PF ±1PF (RH) |
| C125 | 1 | 1 | DD1615009 | Ceramic, 15PF (RH) |
| C126 | 1 | 1 | DD1610004 | Ceramic, 10PF (RH) |
| C127 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| C128 | 1 | 1 | DK1710301 | Ceramic, 0.01μF ±20% |
| | | | | P100—MISCELLANEOUS |
| L104 | 1 | 1 | LO1027901 | OSC Coil, FM |
| L105 | 1 | 1 | LI1001901 | IFT, FM |
| H101 | 1 | 1 | HF200551D | FET, 2SK55 (D) |
| H102 | 1 | 1 | HT305351B | Transistor, 2SC535 (B) |
| H103 | 1 | 1 | HT304611B | Transistor, 2SC461 (B) |
| J101 | 1 | 1 | YP1000114 | Plug |
| J106 | 1 | 1 | | |
| | | | | GENERAL MISCELLANEOUS |
| L003 | 1 | | TS1601501 | Power Transf. |

| REF. DESIG. | U | E | PART NO. | DESCRIPTION |
|-------------|---|---|-----------|---------------------------------|
| L003 | 1 | | TS1601502 | Power Transf. |
| 0111 | 4 | 4 | 52017039J | Bolt |
| 0116 | 6 | 6 | 281815401 | Knob |
| 0124 | 4 | 4 | 51480406S | B. H. M. Screw F |
| 0131 | 1 | 1 | 282825702 | Lid |
| 0133 | 8 | 8 | 51100406S | B. H. M. Screw B 4 x 6 |
| 0303 | 1 | | 290826501 | Indicator, Name Plate |
| 0305 | 1 | | 290826503 | Indicator, Name Plate |
| 0312 | 2 | 2 | 51100305S | B. H. M. Screw B 3 x 5 |
| 0316 | 1 | 1 | 257886101 | Label, UL Caution |
| 0317 | 1 | 1 | 257886102 | Label, Do Not Remove... |
| 0318 | 1 | 1 | 257886103 | Label, See, Marking |
| 0320 | 1 | 1 | 250626506 | Indicator, Do Not Use |
| 0323 | 1 | | 951110103 | Label, UL |
| 0324 | 1 | | 951091102 | Label, UL Factory Co. No. |
| 0710 | 1 | 1 | 287311802 | Spacer |
| 0717 | 1 | 1 | 290826901 | Protector |
| 0718 | 2 | 2 | 51570306B | P. H. Tapt Screw P 3 x 6 ST |
| 0732 | 1 | 1 | 290805102 | Guide |
| 0733 | 2 | 2 | 51102605E | B. H. M. Screw B 2.6 x 5 |
| 0819 | 1 | 1 | 290826201 | Pulley |
| 0821 | 2 | 2 | 59058002G | Washer |
| 0823 | 1 | 1 | 53110303E | Hexagon Nut |
| 0824 | 1 | 1 | 54040302N | Spring Washer |
| 0828 | 2 | 2 | 51470306A | B. H. M. Screw S |
| 1208 | 1 | 1 | 290810901 | Shield |
| 1209 | 5 | 5 | 51570306S | P. H. Tapt Screw P 3 x 6 ST |
| 1320 | 1 | 1 | 56382540G | Eyelet |
| 1323 | 1 | 1 | 290825901 | Bush |
| 1523 | 4 | | 952281501 | Serial No. Card |
| 1525 | 4 | | 952301511 | Serial No. Card |
| F001 | 1 | | FS1005007 | Fuse, 0.5A |
| F001 | 1 | | FS1030004 | Fuse, 3A |
| F002 | 1 | | FS1005003 | Fuse, 0.5A |
| F003 | 1 | | FS1005003 | Fuse, 0.5A |
| 1403 | 1 | | 290885101 | Instructions, Set |
| 1404 | 1 | | 290885121 | Instructions, Set |
| 1409 | 1 | | 290885601 | Schematic Diagram |
| 1411 | 1 | | 290885603 | Schematic Diagram |
| 1416 | 1 | | 288585107 | Instructions, Set Mounting |
| 1417 | 1 | | 288785108 | Instructions, Accessories |
| 1418 | 1 | | 281885104 | Instructions, Partitioner |
| 1423 | 1 | | 257785401 | Guarantee Card |
| 1424 | 1 | | 257785102 | Instructions, Red Tag |
| 1425 | 1 | | 257781301 | Envelope |
| 1431 | 1 | | 281881301 | Envelope |
| 1503 | 1 | 1 | 290880101 | Packing Case, Inner |
| 1504 | 1 | 1 | 290880111 | Packing Case, Outer |
| 1509 | 2 | 2 | 289180301 | Partitioner |
| 1512 | 1 | 1 | 901383033 | Polyethylen Bag, Set |
| 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 |
| 1531 | 1 | 1 | ZA0200007 | Ext. Antenna, FM |
| 1532 | 1 | 1 | ED0120006 | Connective Cord |

8. TECHNICAL SPECIFICATIONS

FM SECTION

| | |
|---|-----------------------------------|
| Tuning Frequency Range | 88 – 108MHz |
| IHF M 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 \sim 50/60Hz (This unit can be converted by a qualified technician to operate on 110/120/240 V \sim 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.

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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| Voltage Conversion | 29 |
| FTZ Regulation | 29 |

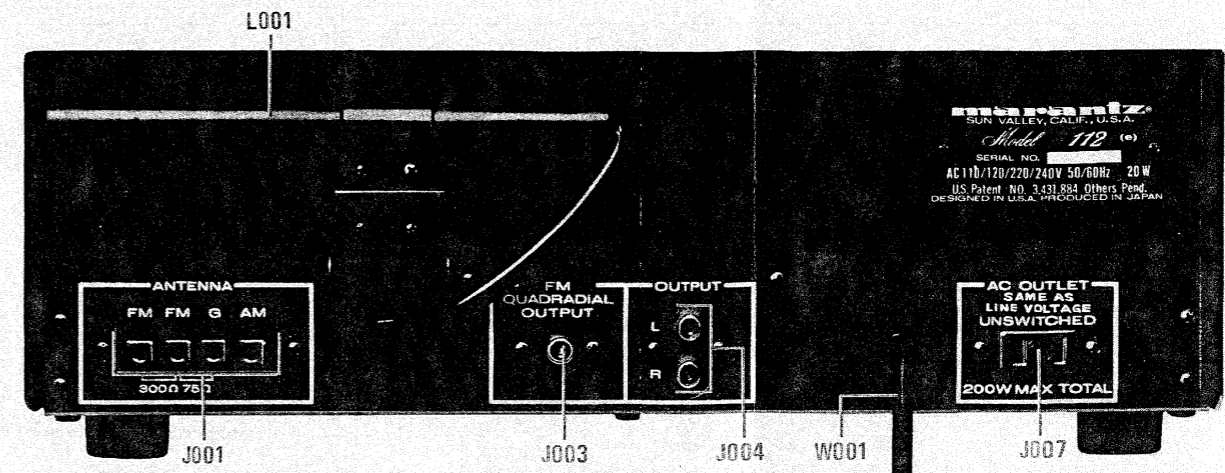


Figure 16. Rear Panel Adjustment and Component Locations

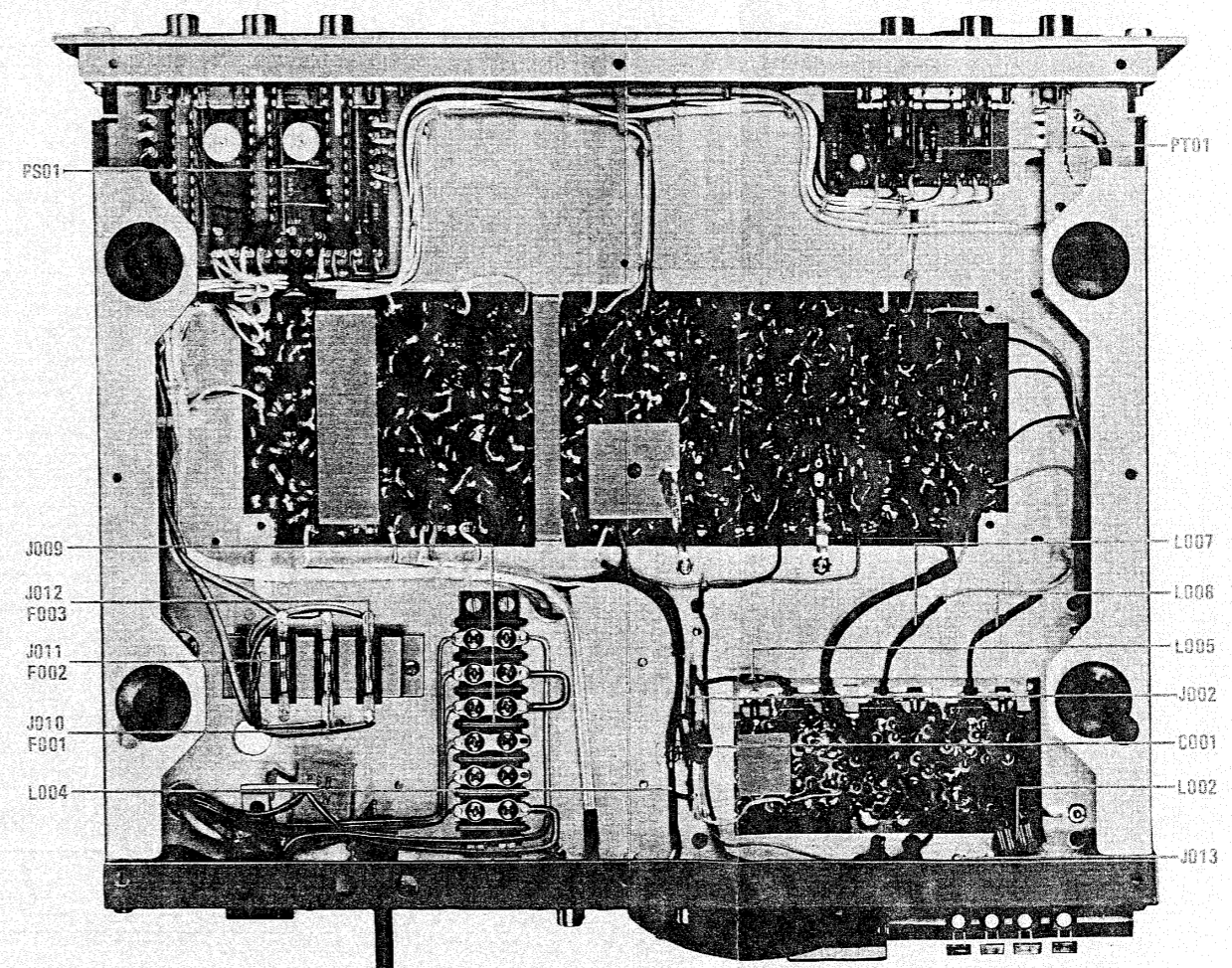
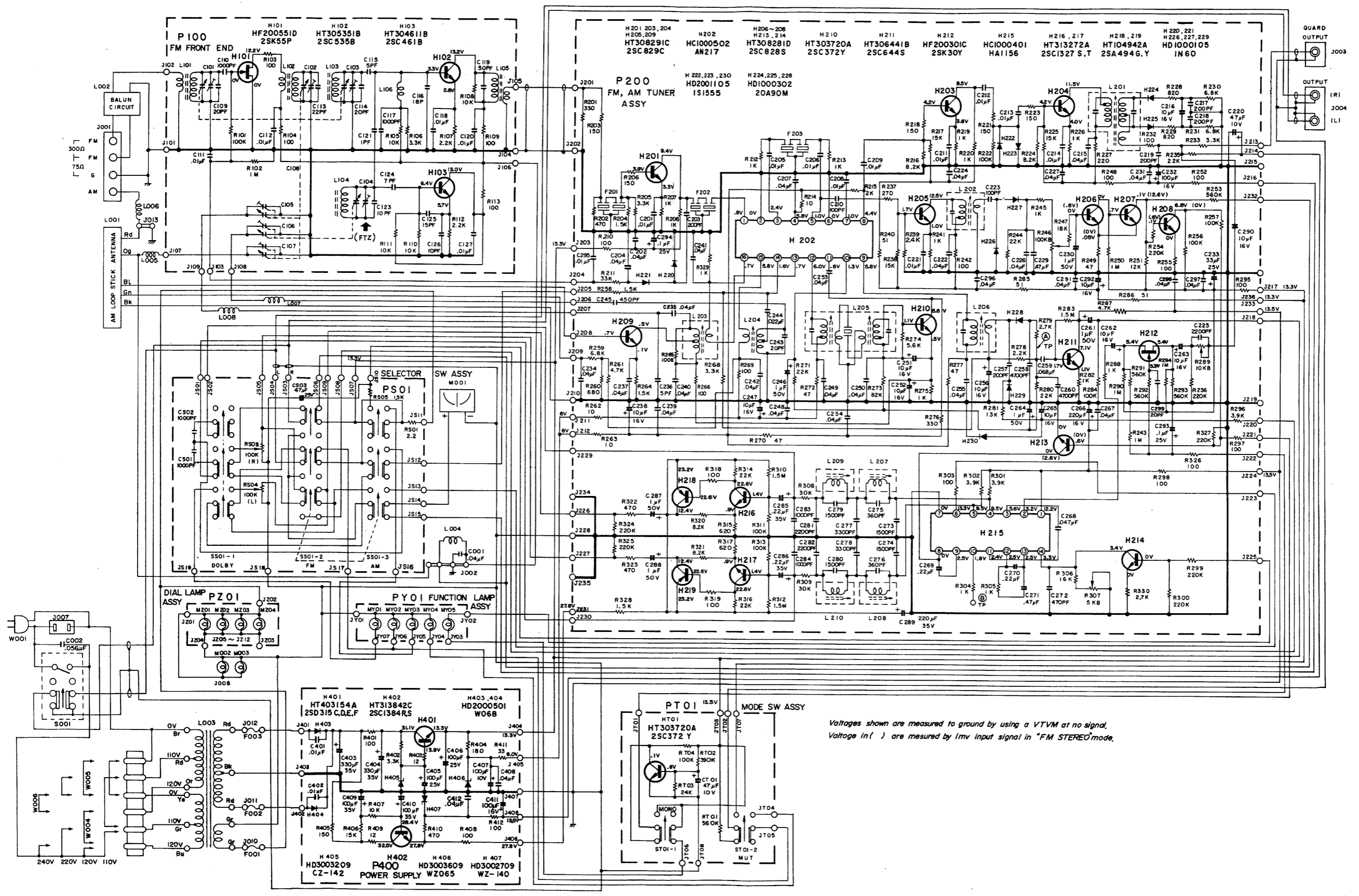


Figure 17. Main Chassis Component Locations (Bottom View)



Voltagess shown are measured to ground by using a VTVM at no signal.
 Voltage in () are measured by 1mv input signal in "FM STEREO" mode.

Figure 18. Schematic Diagram

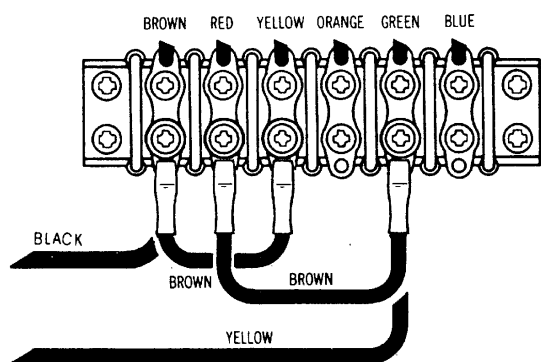
VOLTAGE CONVERSION

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

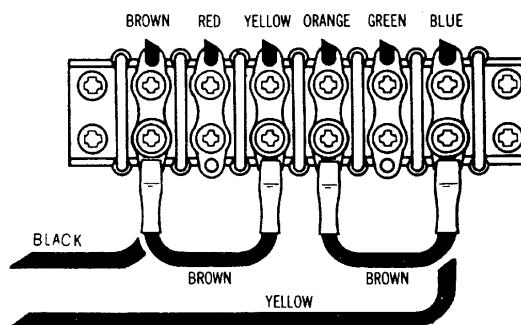
To convert the unit to the required voltage perform the following steps:

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

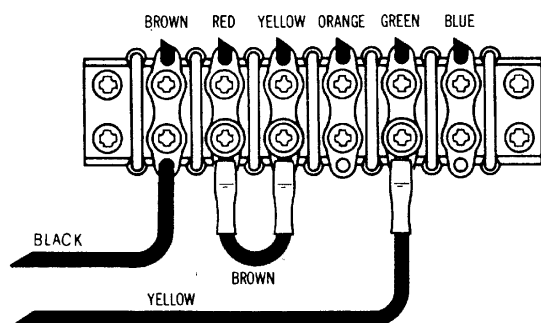
CAUTION: DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE.



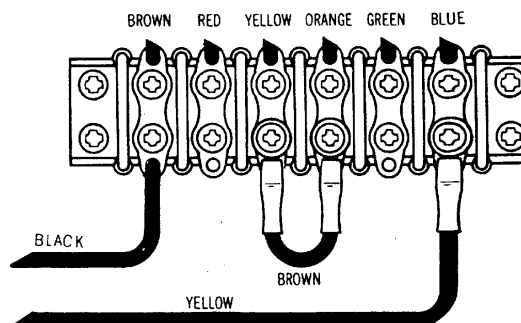
For 110V Operation



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 empfangsbereit sein, bitten wir, den Bereich durch Nachstellen des Kernes in der Oszillatordspule (in der Abbildung mit "FTZ" gekennzeichnet) so zu korrigieren, dass er den Bestimmungen entspricht.