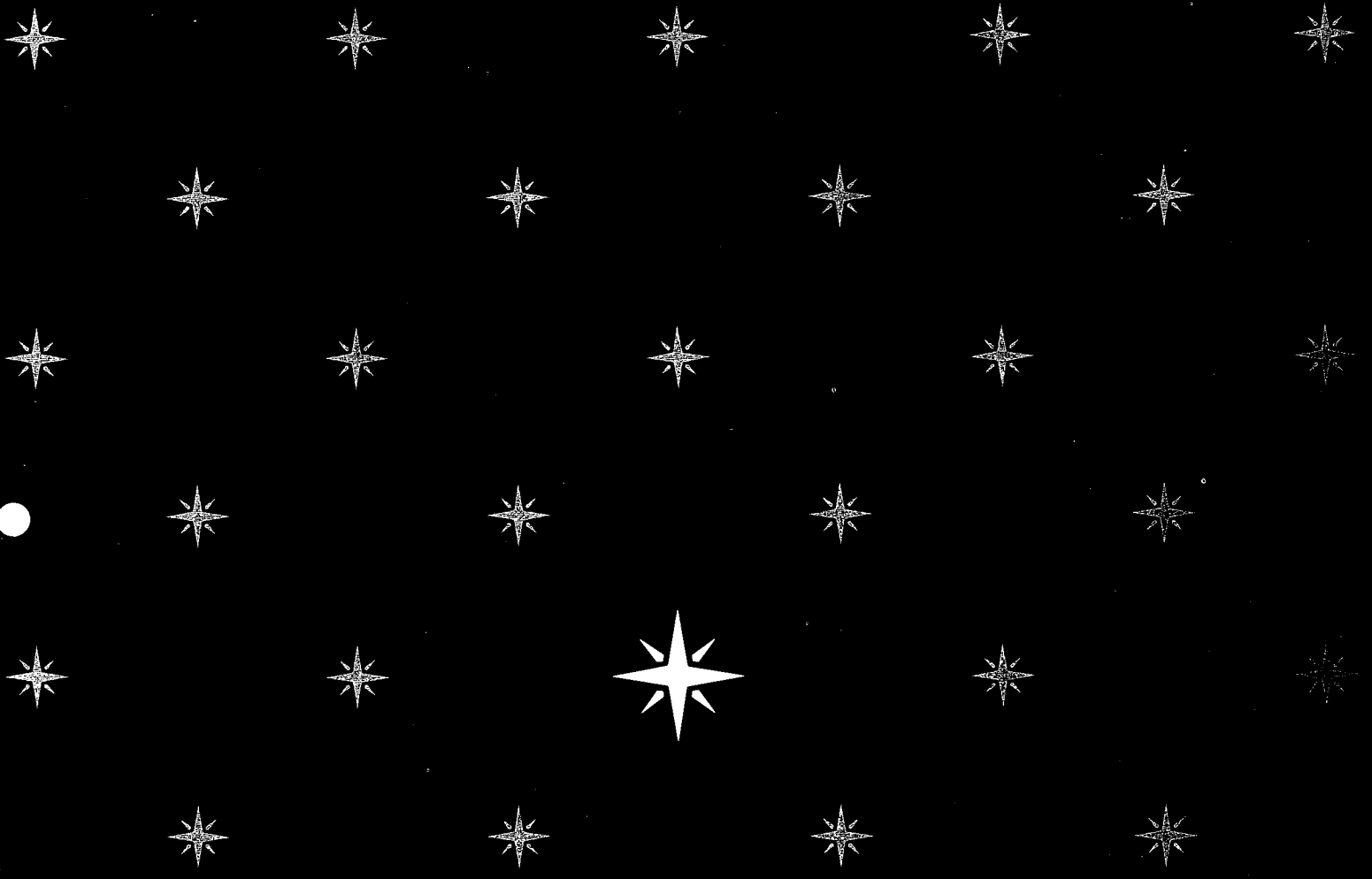


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SERVICE MANUAL 1070



**marantz**

model 1070

*Console Stereo Amplifier*

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## 1. INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for the Marantz Model 1070 Stereo Console Amplifier.

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

The parts list furnishes complete ordering information. Most replacement parts should be ordered from the Marantz Company. However, a simple description is included for parts which can be obtained locally.

## 2. PRE-AMPLIFIER

Signals from the input jacks (TUNER, TAPE-1, TAPE-2 & AUX) are applied to the selector switch.

Signals from the PHONO MIC jacks are applied to the other section of the selector switch, then to the phono-amplifier and equalized for proper frequency response. The gain of the phono-amplifier (H401, H403 and H405) is 40dB.

The outputs of the phono-amplifier are fed to the selector switch. The selector switch selects one of signals from MIC, PHONO, TUNER, AUX, TAPE 1, TAPE 2 jacks and feeds it to the TAPE MONITOR switch and TAPE OUT jacks. The selected signal is then applied to the MODE switch, to the balance and volume controls, and finally to the preamplifier consisting of HE01, HE03, HE05 and HE07.

The frequency response is controlled by the Bass, Middle and Treble controls and the resultant output is passed to the PRE OUT jacks through the High-cut and Low-cut filter networks. These networks are switched in and out of the circuit by the filter switches.

## 3. MAIN AMPLIFIER

The main amplifier consists of differential pre-amplifiers H701 and H703, class "A" driver H707 and direct-coupled drivers H721 and H722.

H709 and H711 act as current limiters.

H726, H727 and H728 form a protector circuit. It protects the speaker from damage due to POWER SWITCH transients or excessively high DC voltage.

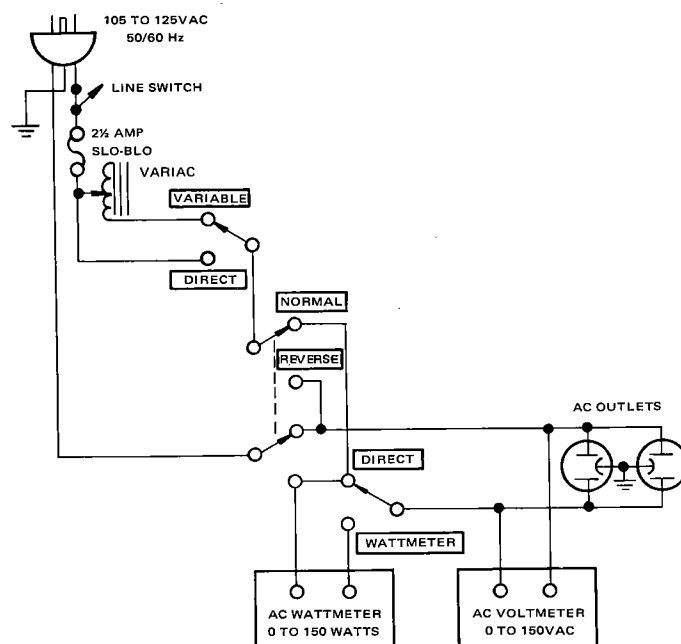


Figure 1. AC Power Control Box Simplified Schematic

**4. TROUBLESHOOTING ANALYSIS**

- 1. Excessive line consumption
  - a. Check for shorted H801, H802, H803.
  - b. Check for shorted transistor H001, through H004.
  - c. Check for open H005, H006, R733, R734.
- 2. No line consumption or zero bias voltage
  - a. Check line cord, fuse, check for shorted H005, H006 R733, R734.
  - b. Check for open rectifiers H801, H802, H803 or open L001.
- 3. High hum and noise level
  - a. Check filter capacitors C001, C002, C803, C804.
- 4. Parasitic oscillation
  - a. Check C703, C704, C707, C708, C715, C716

**5. POWER AMPLIFIER ADJUSTMENT**

**1. Adjustment of Idling current**

Connect VTVM between J714 and J716. Adjust R733 until the meter reads 10mV. Similarly, connect VTVM between J715 and J717 and adjust R734 until the meter reads 10mV.

**2. DC-OFFSET adjustment**

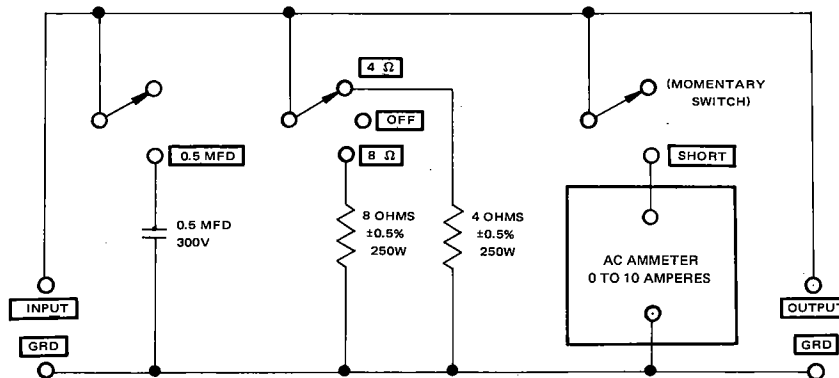
Connect VTVM to J723 and J722 (or ground) and adjust R711 until the meter indication reaches 0mV ( $\pm 5mV$ ). Similarly, connect VTVM to R724 and J722 (or ground) and adjust R712 until the meter indication reaches 0mV ( $\pm 5mV$ ).

**6. POWER SUPPLY ADJUSTMENT**

Connect a voltmeter between J810 and J811. Adjust R807 until meter indicates 40 VDC.

**7. TEST EQUIPMENT REQUIRED FOR SERVICING**

Table 1 lists the test equipment required for servicing the Model 1070 Stereo Console Amplifier. The wattmeter, ac voltmeter, and variable autotransformer may be assembled as a test fixture as shown schematically in Figure 1. The load resistors and ac ammeter may be assembled into a second test fixture as shown in Figure 2.



**Figure 2. Amplifier Output Load Box Simplified Schematic**

| Item   | Manufacturer and Model No. (or equivalent)   | Function   |
|--|--|--|
| Distortion Analyzer                              | Hewlett Packard, Model 331A or 333A  | Measures distortion and voltage of amplifier output.                                       |
| Audio Oscillator                                 | Weston Model CVO-100P<br>(NOTE: Less than 0.02 percent residual distortion is required.) | Sinewave and squarewave signal source.   |
| Oscilloscope                                     | Tektronix, Model 503; Data, Model 555  | Waveform analysis and troubleshooting.   |
| VTVM   | RCA Senior Volt-Ohmyst, Model WV-98C   | Voltage and resistance measurements.   |
| AC Wattmeter                                     | Simpson, Model 390   | Monitors primary power consumption of amplifier.   |
| AC Ammeter (0 to 10 amps)                        | Commercial Grade   | Monitors amplifier output under short circuit condition.                                   |
| Line Voltmeter (0 to 150 vac)                    | Commercial Grade   | Monitors potential of primary power to amplifier.  |
| Variable Autotransformer (0 to 140 vac, 10 amps) | Powerstat, Model 116B  | Adjusts level of primary power to amplifier.   |
| Shorting Plug                                    | Use phono plug with 600 ohms across center pin and shell.                                | Shorts amplifier input to eliminate noise pickup.  |
| Power Supply Bleeder Resistor (10 ohms at 1W)    | Commercial Grade   | Discharges power supply filter capacitors prior to disassembly or resistance measurements. |
| Output Load Resistor (8 $\pm$ 0.5%, 250W)        | Commercial Grade   | Provides 8-ohm load for amplifier output termination.                                      |
| Output Load Resistor (4 $\pm$ 5%, 250W)          | Commercial Grade   | Provides 4-ohm load for amplifier output termination.                                      |
| Output Load Capacitor (0.5 mfd)                  | Mylar  | Provides capacitive load for instability checks.   |
| AC Power Control Box                             | Optional Item. Fabricate in accordance with Figure 1.                                    | Monitors and controls primary power for amplifier.   |
| Amplifier Output Load Box                        | Optional Item. Fabricate in accordance with Figure 2.                                    | Provides various amplifier loads and can monitor shorted output.                           |

## 8. PERFORMANCE VERIFICATION

### Test Procedure

#### A. Test Equipment

Refer to Table 1 for required test equipment.

#### B. Preliminary Procedures

1. Make the test setup shown in Figure 1 with the instrument controls set in the following positions:

|                               |                        |
|-------------------------------|------------------------|
| Line Switch                   | OFF                    |
| Variable-line switch variable |                        |
| Wattmeter Switch              | ON                     |
| Variable Autotransformer      | 0V (fully CCW)         |
| Load                          | 8 ohms (0.5 mfd – OFF) |
| Audio Generator               |                        |
| Frequency                     | 1 KHz                  |
| Output                        | 5V range               |
| Gain                          | Minimum                |
| AC VTVM                       | 30V range              |

2. Make sure that connections between the resistive load and the system terminals of the Model 1070 have negligible resistance when compared with the resistance of the load itself. Appreciable resistance in wiring adds to the total load, resulting in inaccurate measurements of output power.
3. Connect amplifier output to load and connect AC cord to line power. Connect shorting plugs to the Phono input jacks of the model 1070.

#### C. Total Hum and Noise Test

1. With shorting plugs connected to the Phono input jacks and an 8 ohm resistive load connected across the speaker system output terminals, connect a distortion analyzer across the load.

NOTE: If the distortion analyzer does not contain a built-in voltmeter, an AC VTVM may be substituted.

2. Set the distortion analyzer controls for voltage measurements and apply power to the amplifier. Set the volume control fully CCW. Set the SELECTOR switch to PHONO.
3. If the distortion analyzer indicates more than 2.0 mV refer to the trouble analysis section of this manual.
4. Set the volume control fully CW. If the distortion analyzer indicates more than 20 mV refer to the trouble analysis section of this manual.

#### D. Maximum Power Output

1. Connect the audio oscillator to the AUX input. Set audio oscillator frequency to 1 KHz. Set SELECTOR switch to AUX.
2. With the distortion analyzer connected across the output load (8-ohm), set the analyzer on the 30 VAC scale.
3. Turn the analyzer on and increase the audio oscillator output to 180 mV. The AC VTVM should read 16.8 VAC or more.

#### E. Harmonic Distortion Test

1. Set the frequency of the audio oscillator and the distortion analyzer to 20 KHz.
2. Set the controls of the analyzer for voltage measurement on the 30 volt scale.
3. Adjust the audio oscillator output level until the analyzer meter indicates 16.8 VAC.
4. Switch the distortion analyzer to Set Level and adjust SENSITIVITY for full scale reading on 0–1% scale.
5. Measure the total harmonic distortion with the analyzer and verify it is less than 0.3%.

NOTE: Any parasitic oscillation in the amplifier will be displayed on the oscilloscope when capacitance is switched into the load.

6. Switch the distortion analyzer back to SET LEVEL. (Do not readjust sensitivity of analyzer.)
7. Change the frequency of the audio oscillator and distortion analyzer to 1 KHz. Adjust audio oscillator output for a full scale reading on the 0—1% scale.
8. Measure the distortion, verifying it is no greater than 0.3%.
9. Repeat steps 7 and 8, changing frequency to 20 Hz. Distortion should be no more than 0.3%.
10. Check for parasitic oscillation; there should be none.

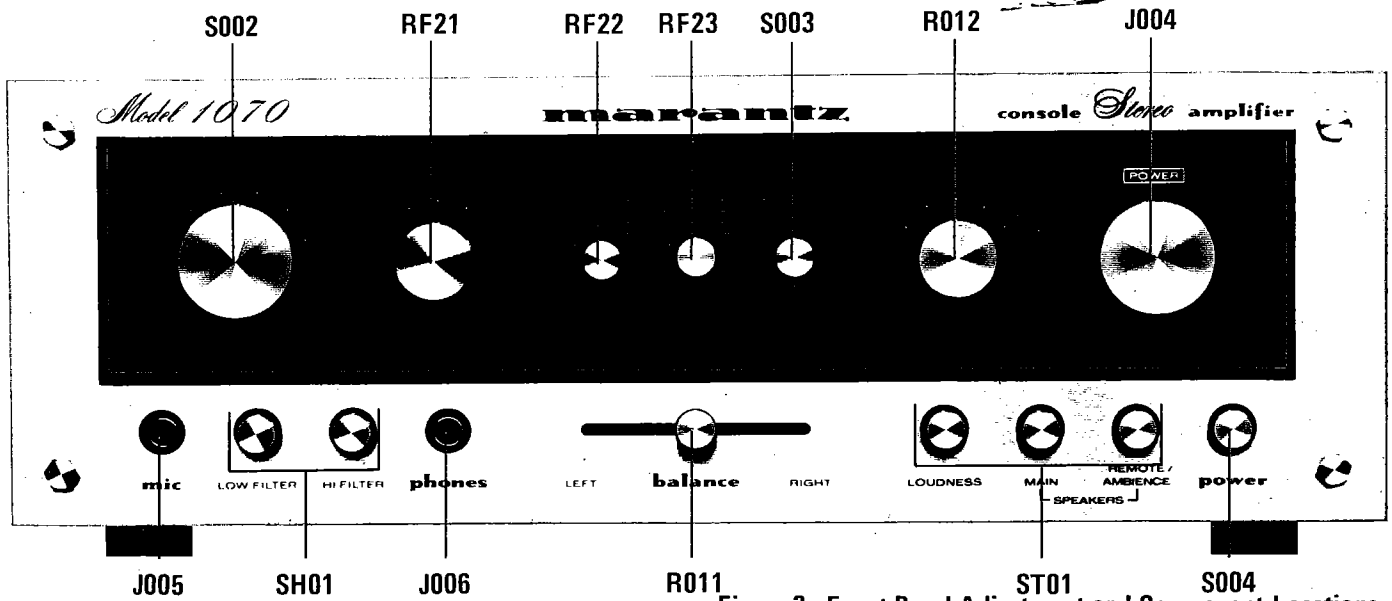


Figure 3. Front Panel Adjustment and Component Locations

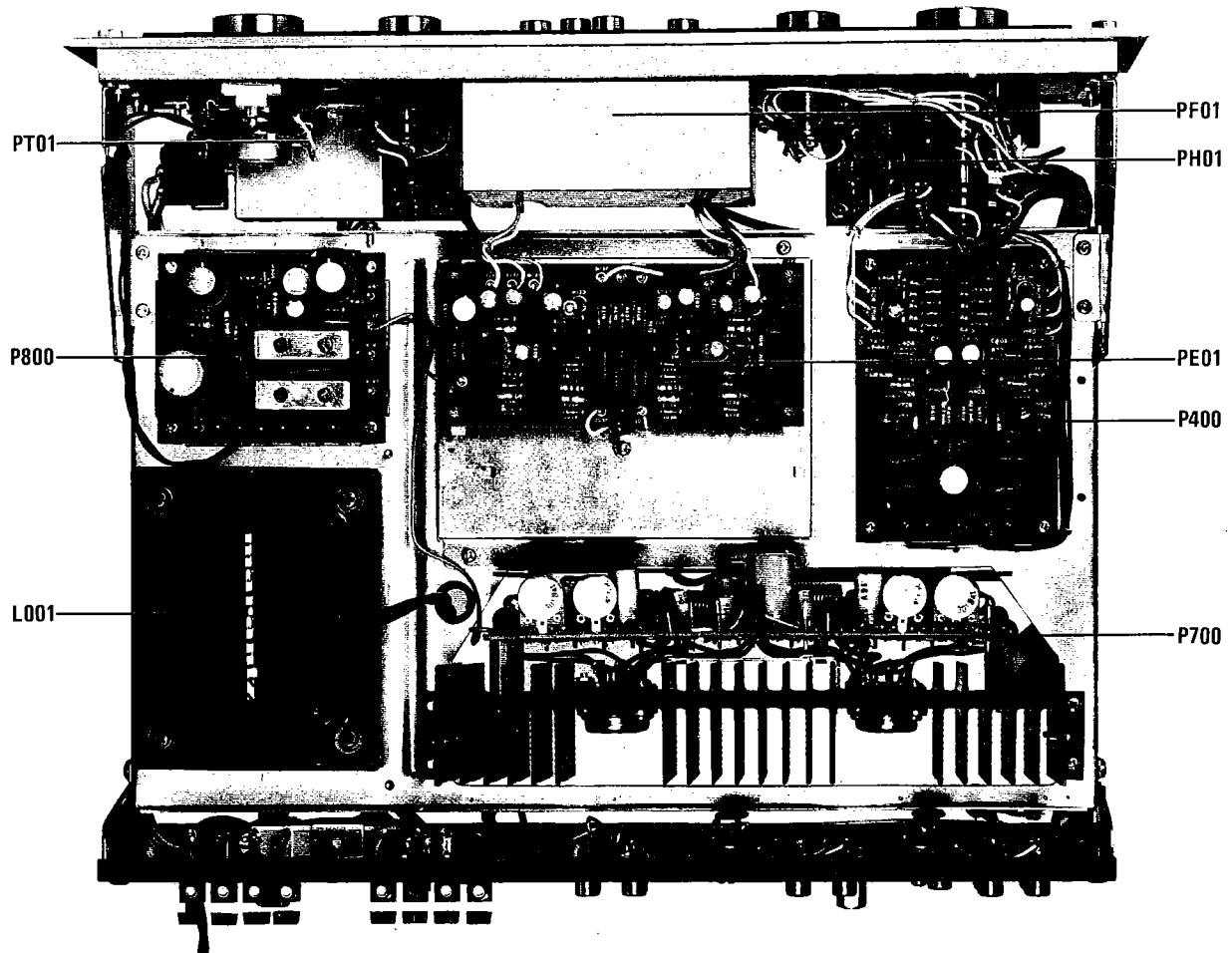


Figure 4. Main Chassis Component Locations (Top View)



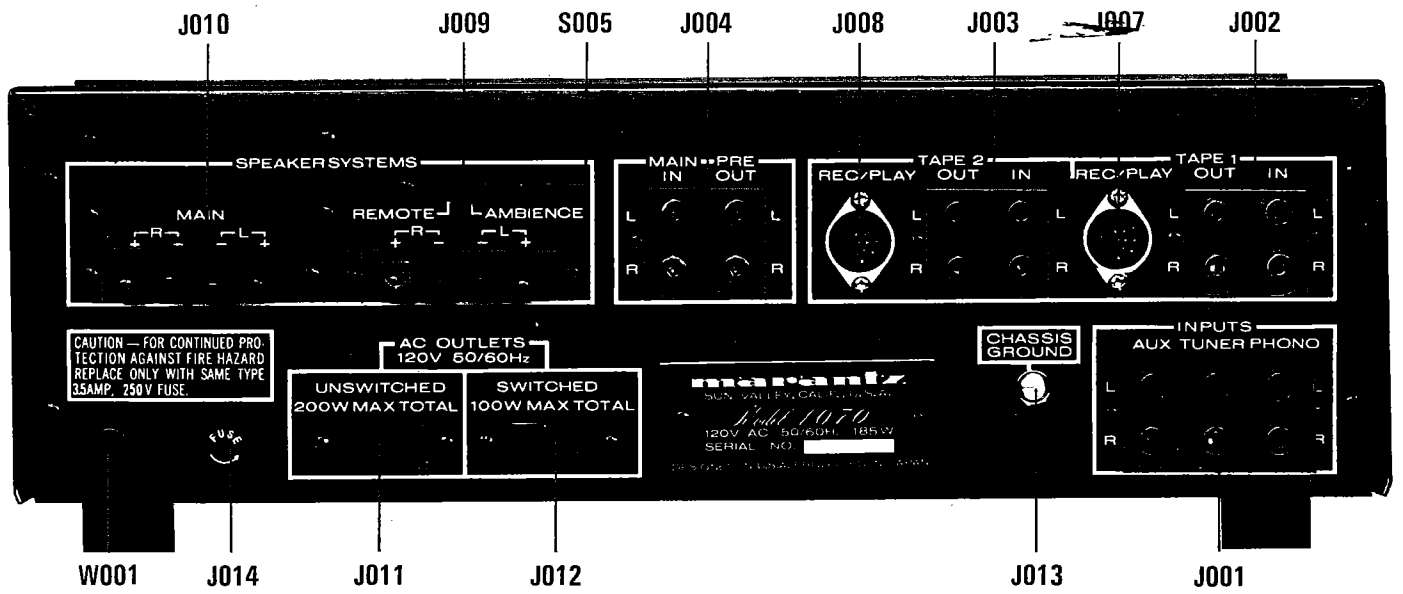


Figure 5. Rear Panel Adjustment and Component Locations

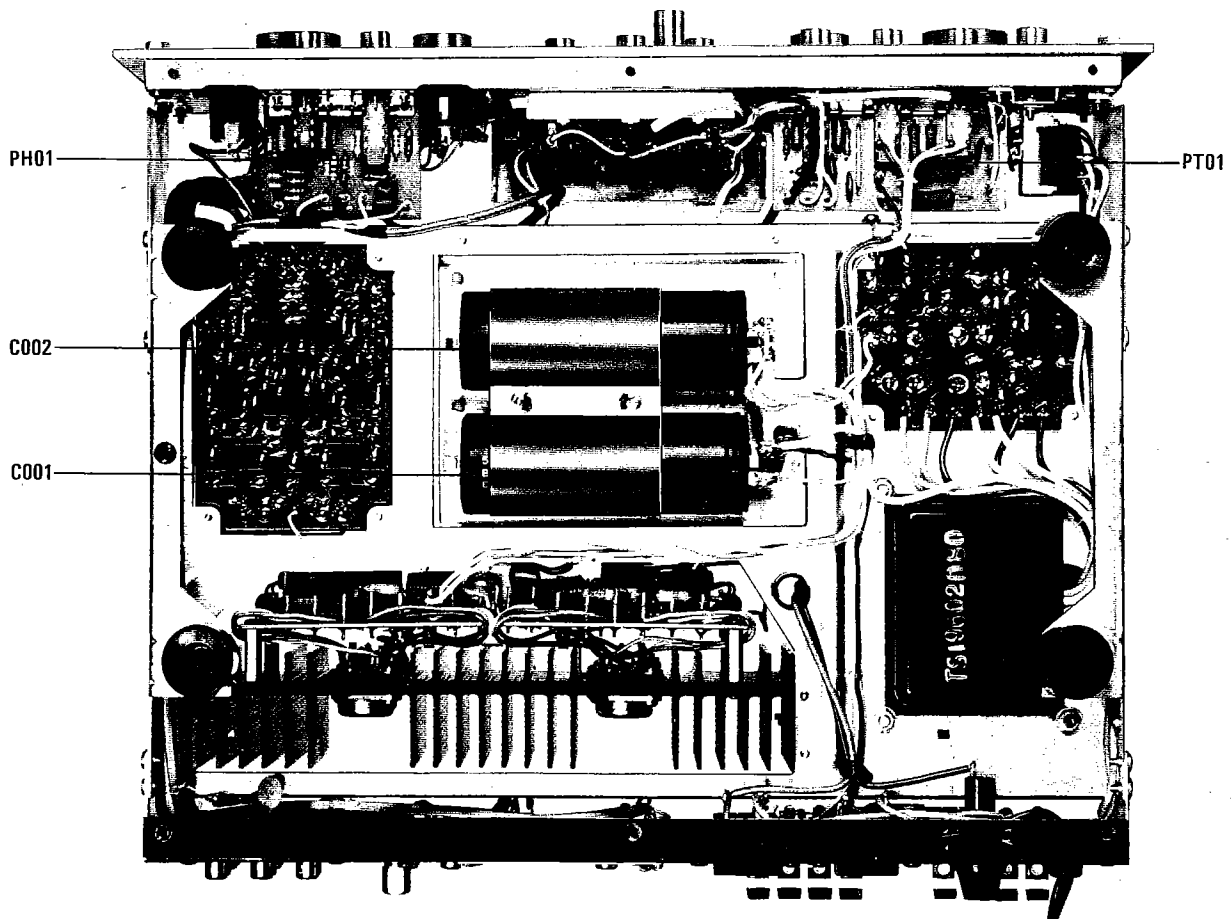


Figure 6. Main Chassis Component Locations (Bottom View)

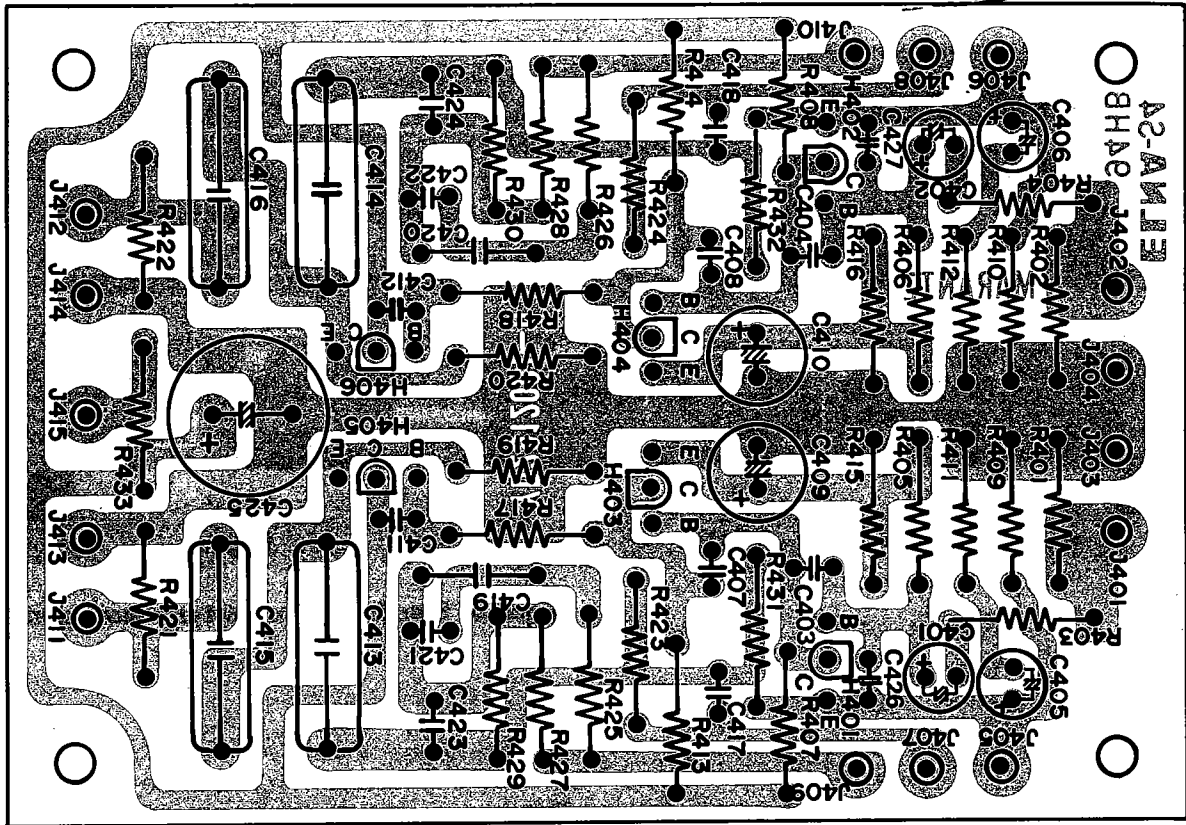


Figure 7. Phono Amplifier Assembly P400 Component Locations

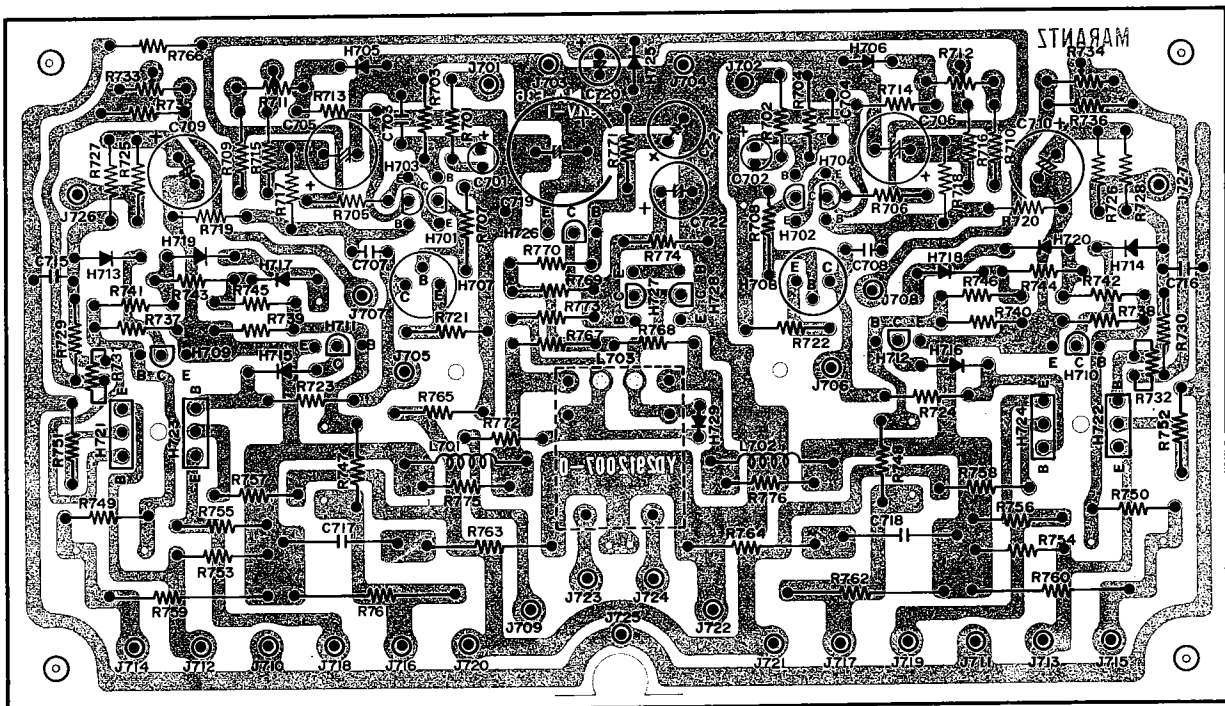


Figure 8. Main Assembly P700 Component Locations

