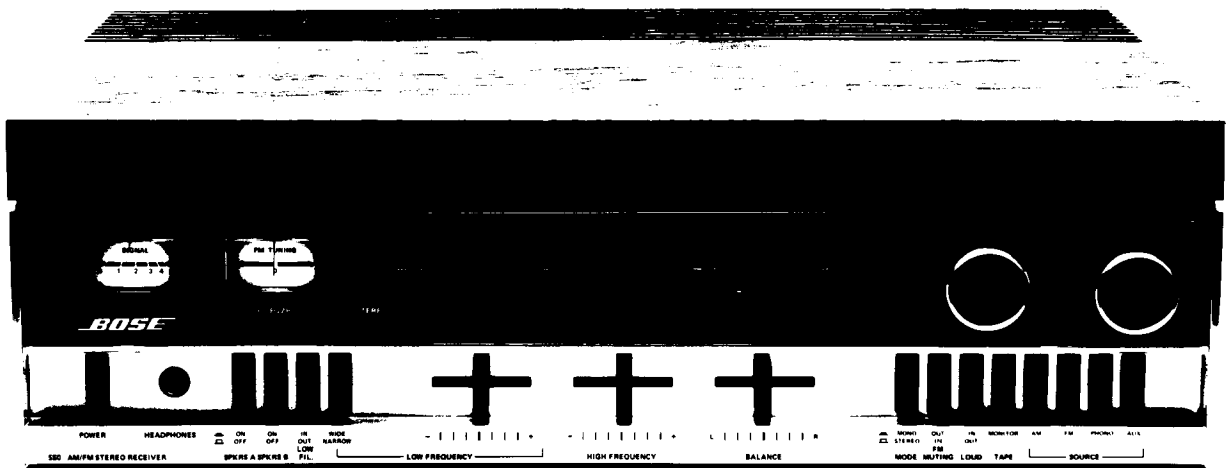



# Model 550 AM/FM Stereo Receiver



# Contents

<b>Safety Information</b> .....	3
<b>Electrostatic Discharge Sensitive (ESDS) Device Handling</b> .....	4
<b>Specifications</b> .....	5-6
<b>Technical Description</b> .....	7
<b>Disassembly/Assembly Procedures</b> .....	8-10
Figure 1. Antenna Placement Diagram .....	10
<b>Test Procedures</b> .....	11-14
Figure 2. AM/FM Adjustment Location .....	12
Figure 3. Amp Adjustment Location .....	14
Figure 4. Block Diagram .....	15
Figure 5. Wiring Diagram .....	16
Figure 6. Main PCB Layout .....	17
Figure 7. PCB Layout .....	18
Figure 8. Exploded View .....	19
Figure 9. Dial String Diagram .....	20
Figure 10. Pinout Location Diagram .....	21
<b>Part List Notes</b> .....	22
<b>Part List</b> .....	23-30
<b>Voltage Conversion Instructions</b> .....	31

# SAFETY INFORMATION

1. Parts that have special safety characteristics are identified by the  symbol on schematics or by special notes on the parts list. Use only replacement parts that have critical characteristics recommended by the manufacturer.
2. Make leakage current or resistance measurements to determine that exposed parts are acceptably insulated from the supply circuit before returning the unit to the customer. Use the following checks to perform these measurements:

**A. Leakage Current Hot Check-**With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.1 "Leakage Current for Appliances" and Underwriters Laboratories (UL) 1492 (71). With the unit AC switch first in the ON position, then in the OFF position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the unit (antennas, handle bracket, metal cabinet, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milliamp. Reverse the unit power cord plug in the outlet and repeat test. **ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE UNIT TO THE CUSTOMER.**

**B. Insulation Resistance Test Cold Check-**(1) Unplug the power supply and connect a jumper wire between the two prongs of the plug. (2) Turn on the power switch of the unit. (3) Measure the resistance with an ohmmeter between the jumpered AC plug and each exposed metallic cabinet part on the unit. When the exposed metallic part has a return path to the chassis, the reading should be between 1 and 5.2 Megohms. When there is no return path to the chassis, the reading must be "infinite". If it is not within the limits specified, there is the possibility of a shock hazard, and the unit must be repaired and re-checked before it is returned to the customer.

# ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICE HANDLING

This unit contains ESDS devices. We recommend the following precautions when repairing, replacing or transporting ESDS devices:

- Perform work at an electrically grounded work station.
- Wear wrist straps that connect to the station or heel straps that connect to conductive floor mats.
- Avoid touching the leads or contacts of ESDS devices or PC boards even if properly grounded. Handle boards by the edges only.
- Transport or store ESDS devices in ESD protective bags, bins, or totes. Do not insert unprotected devices into materials such as plastic, polystyrene foam, clear plastic bags, bubble wrap or plastic trays.

**CAUTION: THE 550 RECEIVER CONTAINS NO USER-SERVICEABLE PARTS. TO PREVENT WARRANTY INFRACTIONS, REFER SERVICING TO WARRANTY SERVICE STATIONS OR FACTORY SERVICE.**

# SPECIFICATIONS

<b>AM Tuner:</b>	20 dB Usable Sensitivity	350 uV (ferrite loopstick)	
	Adjacent Channel Selectivity	35 dB	
	Total Distortion	.9% (400 Hz @ 30% Modulation)	
	Image Rejection	37 dB	
	IF Rejection	45 dB	
	Signal to Noise Ratio	40 dB	
	<b>FM Tuner:</b>	IHF Usable Sensitivity	2.0 uV/11.25 dBf (Mono) 3.5 uV/16.11 dBf (Stereo)
50 dB Quieting Sensitivity		3.8 uV/16.82 dBf (Mono) 35 uV/37.27 dBf (Stereo)	
Frequency Response		30 Hz - 15kHz, +1.0 dB - 3.0 dB	
Signal to Noise Ratio @ 65 dBf		65 dB (Mono) 60 dB (stereo)	
THD @ 65 dBf		.25% (Mono) .50% (Stereo)	
Capture Ratio		1.9 dB	
Alternate Channel Sensitivity		60 dB	
Spurious Response Rejection		80 dB	
Image Rejection		65 dB	
AM Rejection		50 dB	
Stereo Separation, 1kHz		40 dB	
<b>Channel Separation:</b>		AUX. and Tape	60 dB @ 1kHz (at Tape - Out)
		Phono	55 dB @ 1kHz (at Tape - Out)
<b>Phono Overload:</b>		100 mV	
<b>Loudness Contour:</b>	+8 dB @ 100 Hz ( $\pm 2$ dB)	+6 dB @ 12kHz ( $\pm 2$ dB)	

# SPECIFICATIONS

<b>Input Sensitivity</b>		
<b>Impedance:</b>	Aux. and Tape	150 mV/ 50k Ohm
<b>Capacitance:</b>	Phono	2.75 mV/ 47k Ohm, 150 pF
<b>Source and Room Compensation</b>	Low Filter	-3 dB @ 100Hz -7 dB max. @ 20Hz
<b>Controls:</b>	Low Frequency Control Narrow Position	±8 dB @ 140Hz (center frequency) ±1 dB @ 20Hz and 1kHz
	Wide Position	±3 dB @ 350Hz ±8 dB @ 50Hz
	High Frequency Control	±8 dB @ 15kHz ±3 dB @ 2.2kHz
<b>Frequency Response:</b>	20 Hz to 20 kHz	±0.5 dB
	Phono RIAA	±0.5 dB
<b>Amplifier Power Output:</b>	40 Watts per Channel minimum RMS continuous power @ 8 Ohms, THD < .3%	20Hz to 20kHz
<b>IHF Power Bandwidth:</b>	20Hz to 20kHz	both channels driven THD <.19%
<b>Intermodulation Distortion:</b>	.09% IHF	60 Hz/7kHz 4:1 mixed at rated output
<b>Signal to Noise Ratio:</b>	Amplifier	87 dB A- weighted (below rated output) inputs shorted 91 dB A- weighted (below rated output) min. volume
	Phono	76 dB A- weighted (below rated output) inputs shorted
<b>Power Requirements:</b>	120 Volts AC 60 Hz (USA model)	220 Volts AC 50-60 Hz (export model)
<b>Power Consumption:</b>	360 Watts at rated power	
<b>AC Outlets:</b>	1 switched, 1 unswitched	400 watts max.
<b>Dimensions:</b>	18 1/4" x 5 3/4" x 12 1/4"	46.6 (w) x 14.6 (h) x 31.1 (d) cm
<b>Weight:</b>	15 1/2 lbs	7 Kg

## TECHNICAL DESCRIPTION

The Model 550 AM/FM Stereo Receiver features a high quality AM/FM Stereo tuner and a direct-coupled amplifier with 40 watts of RMS power per channel.

The Model 550 includes a built-in 901<sup>®</sup> Series IV equalizer, that provides extra value and convenience to present owners and future purchasers of Bose<sup>®</sup> 901 loudspeakers. The built-in equalizer can be switched into the circuit when playing Bose 901 Series III or Series IV speakers. You can pre-set the Model 550 via the rear panel switches for various combinations of loudspeakers. This provides correct equalization when switching from one pair of speakers to the other.

The receiver incorporates Source and Room Compensation Controls unique to Bose electronic equipment. These controls allow you to compensate more accurately for problems in room acoustics and recordings. The result is greater realism and enjoyment.

# DISASSEMBLY/ASSEMBLY PROCEDURES

**Note:** Numbers in parentheses correspond to the callouts in Figure 8.

## 1. Top Cover Removal

**1.1** Remove the 4 screws (A-14) located on each side of the unit.

**1.2** Lift the top cover (A-2) off of the unit.

## 2. Top Cover Replacement

**2.1** Place the top cover onto the top of the unit.

**2.2** Secure the top cover to the unit.

## 3. Bottom Cover Removal

**3.1** Remove the 5 screws (L-13) that secure the bottom cover (A-3) to the unit.

**3.2** Remove bottom cover.

## 4. Bottom Cover Replacement

**4.1** Place the bottom cover onto the unit.

**4.2** Secure the bottom cover to the unit.

## 5. Front Panel Removal

**5.1** Perform procedures 1 and 3.

**5.2** Remove the volume, tuning, and slide pot knobs.

**5.3** Locate and remove the 3 screws (L-3) that secure the front panel (A-1) to the top front of the unit.

**5.4** Unclip the 4 plastic clips located at the bottom of the front panel and remove the panel from the unit.

## 6. Front Panel Replacement

**6.1** Place the front panel onto the unit and clip the bottom of the front panel into place.

**6.2** Secure the top of the front panel and replace the knobs.

## 7. 901® EQ PC Board Removal

**Note:** There is no callout on Figure 8. for the EQ board. The 901 EQ board is located under the dial lamp and behind the slide pots.

**7.1** Perform procedures 1 and 3.

**7.2** Using a pair of pliers, unclip the three plastic standoffs holding the board in place.

## 8. 901 EQ PC Board Replacement

**8.1** Align the standoffs over the holes in the main PC board. Push the 901 EQ board into place.

## 9. Slide Pot Removal

**9.1** Perform procedures 5 and 7.

**9.2** Unscrew the two screws (L-12) that secure each of the slide pots to the front of the unit.

**9.3** Remove the slide pots through the bottom of the unit.

## 10. Slide Pot Replacement

**10.1** Guide the slide pot assembly through the bottom of the unit and place it into the front of the unit.

**10.2** Secure the slide pots to the unit.



# DISASSEMBLY/ASSEMBLY PROCEDURES

## 11. Dial Lamp Assembly Removal

11.1 Perform procedure 1.

11.2 Carefully slide the dial lamp PC board to the left (with the unit facing you) and lift the board off of the clips.

11.3 Lift the board up towards the top of the unit and replace any defective bulbs.

## 12. Dial Lamp Assembly Replacement

12.1 Position the dial lamp PC board over the locking clips.

12.2 While aligning the clips with the holes in the PC board, carefully slide the board to the right to secure it to the lamp housing.

## 13. Selector Lamp Assembly Removal

13.1 Perform procedure 7.

13.2 Remove the screw (L-1) securing the PC board to the front housing.

13.3 Unclip the ends of the board and remove it from the housing.

13.4 Replace any bulbs that are defective.

## 14. Selector Lamp Assembly Replacement

14.1 Place the PC board into the housing and clip it into place.

14.2 Secure the board to the housing.

## 15. Meter Lamp Assembly Removal

15.1 Perform procedure 1.

15.2 Remove the screw (L-1) securing the meter lamp PC board to the housing.

15.3 Cut any tie wraps needed and remove the PC board from the housing.

15.4 Replace any defective bulbs.

## 16. Meter Lamp Assembly Replacement

16.1 Place the PC board into the housing and secure it to the housing.

16.2 Replace any tie wraps that had been removed.

## 17. Volume Control Removal

17.1 Perform procedure 5.

17.2 Remove the nut securing the volume control to the front housing and remove the control from the rear of the housing.

## 18. Volume Control Replacement

18.1 Place the volume control through the rear of the front housing.

18.2 Secure the volume control to the front housing.

## 19. Power Switch Removal

19.1 Perform procedure 5.

19.2 Remove the two screws securing the power switch to the front assembly.

19.3 Remove the power switch through the bottom of the unit.

## 20. Power Switch Replacement

20.1 Place the power switch into the front assembly.

20.2 Secure the power switch to the front assembly.

# TEST PROCEDURES

## 1. AM Tuner Adjustment Procedure

**Note:** Refer to the antenna placement diagram Figure 1.

**1.1** Connect an AM signal generator to an AM loop antenna. Set the frequency according to the AM alignment procedure listed below.

**1.2** Connect a voltmeter to the tape output jacks on the rear panel.

**1.3** Refer to the adjustment location chart (Figure 2.) for the location of the tuning coils called out in the AM alignment procedure.

## 2. FM/MPX Tuner Adjustment

**2.1** Connect an FM signal generator to the antenna terminals on the rear panel.

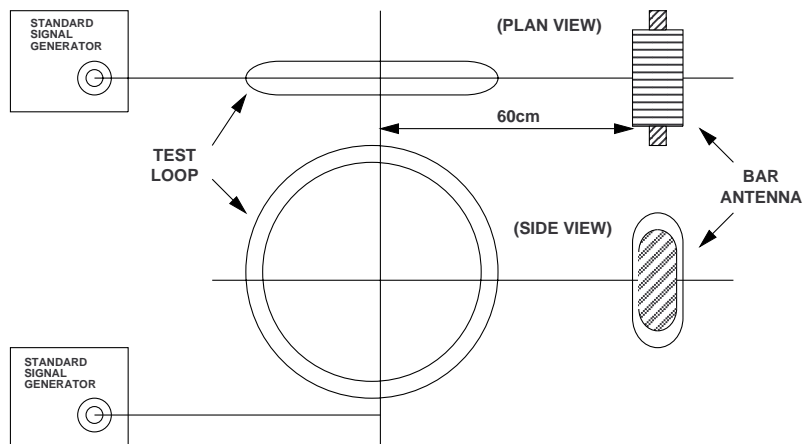
**2.2** Connect a voltmeter to the tape output jacks on the rear panel.

**2.3** Refer to the adjustment location chart (Figure 2.) for the location of the tuning coils called out in the FM/MPX alignment procedure.

**2.4** Perform the tests listed on the next page for the FM and MPX sections.

## AM Alignment Procedure

CIRCUIT ALIGNMENT	EQUIPMENT CONNECTION	STEP	GEN. FREQ.	DIAL SETTING	ADJUSTMENTS
IF	AM IF Sweep Generator MARKER Generator to TP "B" OSCILLOSCOPE across point TPF	1	455 KHz (400Hz Mod.)	Tuning gang Fully closed	T6 & T8 (AM IFT) Adjust for maximum output. Repeat until no further improvement can be made.
BAND	AM Signal Generator with loop antenna.	4	600 KHz (400Hz Mod.)	600KHz	L 5 (AM OSC. Coil) Adjust for maximum output.
		5	1400KHz (400Hz Mod.)	1400KHz	TC 6 (AM OSC. Trimmer) Adjust for maximum output.
		6			Repeat steps 3 and 4.
TRACKING	AM Signal Generator with loop antenna.	7	600KHz	Tune to signal	T 7 (AM ant. Coil) Adjust coil on ferrite core for maximum output.
		8	1400KHz	Tune to signal	TC 4 (AM ANT. Trimmer) Adjust for maximum output.
		9		Tune to signal	Repeat steps 6 and 7.



**Figure 1. Antenna Placement Diagram**

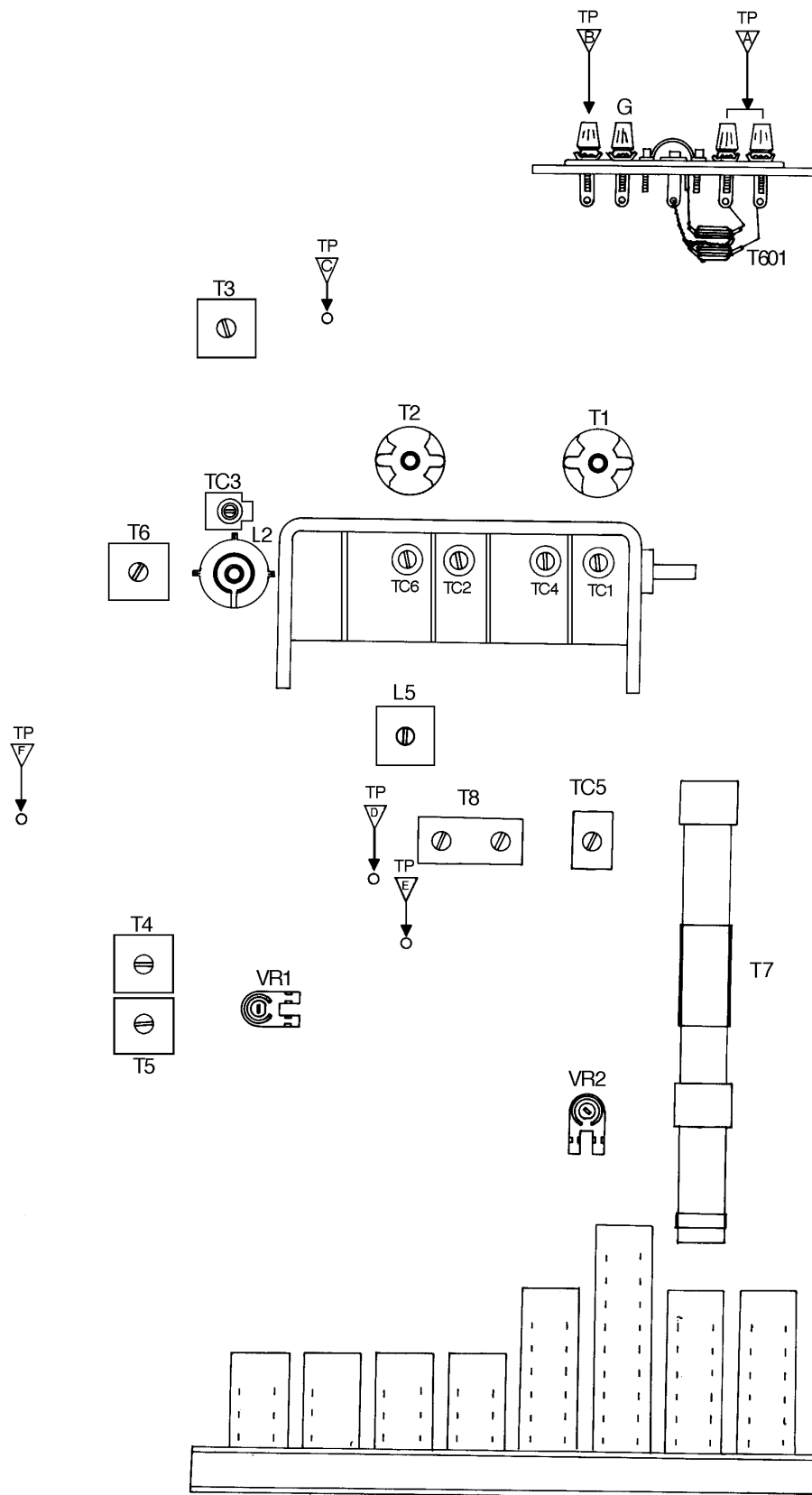
# TEST PROCEDURES

## FM Alignment Procedure

CIRCUIT ALIGNMENT	EQUIPMENT CONNECTION	STEP	GEN. FREQ.	DIAL SETTING	ADJUSTMENTS
Quadrature Detector	FM SIGNAL GENERATOR to antenna terminals through 300 dummy antenna. Oscilloscope, Dist. meter and Output Meter (VTVM) to TAPE OUT.	1	98MHz	Tune to signal	FM SIGNAL GENERATOR output; no output Tuning meter needle adjust to center by T 4 output: 1mV 100% mod. T5 adjust for minimum distortion.
IF	IF SWEEP GENERATOR MARKER GENERATOR to TP "C" oscilloscope across TP "D"	2	10.7 MHz	Tuning gang fully closed	T 3, 4, 5 Adjust for maximum noise & symmetrical response.
		3			Repeat step 2 to verify adjustment.
RF AMPLIFIER	FM SIGNAL GENERATOR to antenna terminals through 300 ohm antenna matching network Output Meter (VTVM) to TAPE OUT.	4	90MHz (100% Mod.)	Tune to signal	T2 (RF Coil) T1 (ANT Coil) Adjust for maximum output.
		5	106MHz (100% Mod.)	Tune to signal	TC1, TC2 Adjust for maximum output.
		6			Repeat steps 4 and 5 to obtain suitable sensitivity at 90MHz and 106MHz.
LOCAL OSCILLATOR	FM SIGNAL GENERATOR to antenna terminals through 300 ohm antenna matching network Output Meter (VTVM) to TAPE OUT.	7	87.35 MHz	Minimum	L 2 (OSC. Coil) Adjust for maximum output.
		8	108MHz	108MHz	TC 3 (OSC. Trimmer) Adjust for maximum output.
		9			Repeat steps 7 and 8 several times.

## MPX Alignment Procedure

CIRCUIT ALIGNMENT	EQUIPMENT CONNECTION	GEN. FREQ.	DIAL SETTING	ADJUSTMENTS
19/38KHz	FM STEREO SIG. GEN. connect to EXT. MOD. of FM SIGNAL GENERATOR. FM SIG. GEN. to antenna terminals through 300 ohm antenna matching network Frequency Counter to TP "E"	98mHz (Mod.)	98mHz	(1) FM SIGNAL GENERATOR Output: 1mV unmod. Counter reading adjust to 19 KHz by VR 2  (2) Add composite signal to FM SIGNAL GENERATOR. Adjust VR 2 for max. separation.



**Figure 2. AM/FM Adjustment Location**

# TEST PROCEDURES

## 3. Loudness Control Procedure

**Note:** Use the following control settings. Slide pots centered, speaker A switch selected with the output connected to an 8 ohm load, all switches out except for the aux switch.

**3.1** Apply a **100Hz** signal at **1Volt** to the aux input.

**3.2** Rotate the volume control until 1.5 Vrms is measured at the output.

**3.3** Reference a dB meter to the output.

**3.4** Push the loudness switch IN. There should be a +8dB change in response at the output.

**3.5** Change the signal to **12kHz** and repeat step 3.3 and 3.4. There should be a + 6dB change in response at the output.

## 4. Low Filter Procedure

**4.1** Perform procedure 3.1, 3.2, and 3.3.

**4.2** Push the low filter switch IN. There should be a -3dB change in response at the output.

**4.3** Change the input frequency to **20Hz** and reference a dB meter to the output.

**4.4** Push the low filter switch IN. There should be a -7dB change in response at the output.

## 5. Low Frequency Control Procedure

**5.1** Apply a **140Hz** signal at **1Volt** to the aux input.

**5.2** Rotate the volume control until 1.5 Vrms is measured at the output.

**5.3** Reference a dB meter to the output with the low frequency control centered and the wide/narrow switch in the OUT position.

**5.4** Slide the control from one side to the other. There should be a + 8dB and -8dB change in response ( $\pm 1$ dB) from the center.

**5.5** Push the wide/narrow switch IN. Change the frequency to **350Hz**. With the low frequency control centered reference a dB meter to the output.

**5.6** Slide the control from side to side. There should be a +3dB and -3dB change in response ( $\pm 1$ dB) from the center.

## 6. High Frequency Procedure

**6.1** Apply a **15kHz** signal at **1Volt** to the aux input.

**6.2** Reference a dB meter to the output.

**6.3** Slide the high frequency control from side to side. There should be a +8dB and -8dB change in response ( $\pm 1$ dB) at the output.

**6.4** Change the input signal to **2.2kHz**. Slide the control from side to side. There should be a +3dB and -3dB change in response ( $\pm 1$ dB) at the output.

## 7. 901® EQ Response Procedure

**7.1** Apply a **250Hz** signal **1Volt** to the aux input. Reference a dB meter to the output.

**7.2** Switch the EQ switch located on the rear panel from the **other** position to the **901** position. There should be a -1dB change in response at the output.

# TEST PROCEDURES

7.3 Reference a dB meter to the output.

7.4 Check the response using the chart below.

**901® Response Chart**

Frequency	Output	Tolerance
40Hz	+16dB	±2dB
250Hz	0dB Reference	----
700Hz	-7.0dB	±2dB
10kHz	+16dB	±2dB
14kHz	+21dB	±2dB

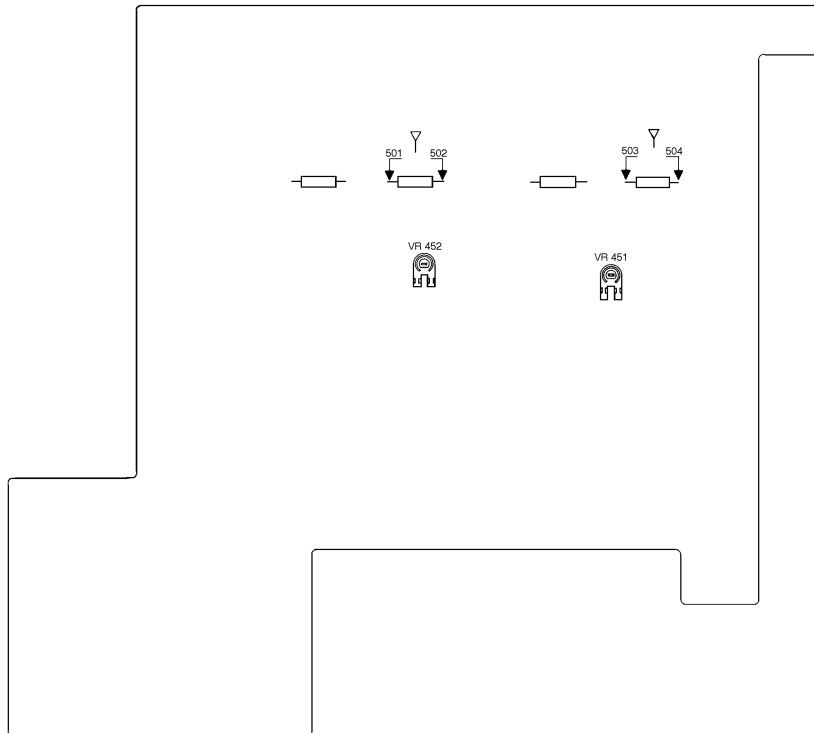
## 8. Amplifier Adjustment Procedure

**Note:** Preheat the unit for about 20 minutes prior to performing the following procedure.

**8.1** Connect a DC voltmeter to the test points TP 501-502 (across R536) for the right channel and at TP 503-504 (across R537) for the left channel see Figure3. for the TP locations.

**8.2** Connect the output to an 8 ohm load, volume set to the minimum position, with no signal applied.

**8.3** Adjust VR452 for the right channel and VR451 for the left channel to a setting of **7mV** at the test points.



**Figure 3. Amp Adjustment Location**



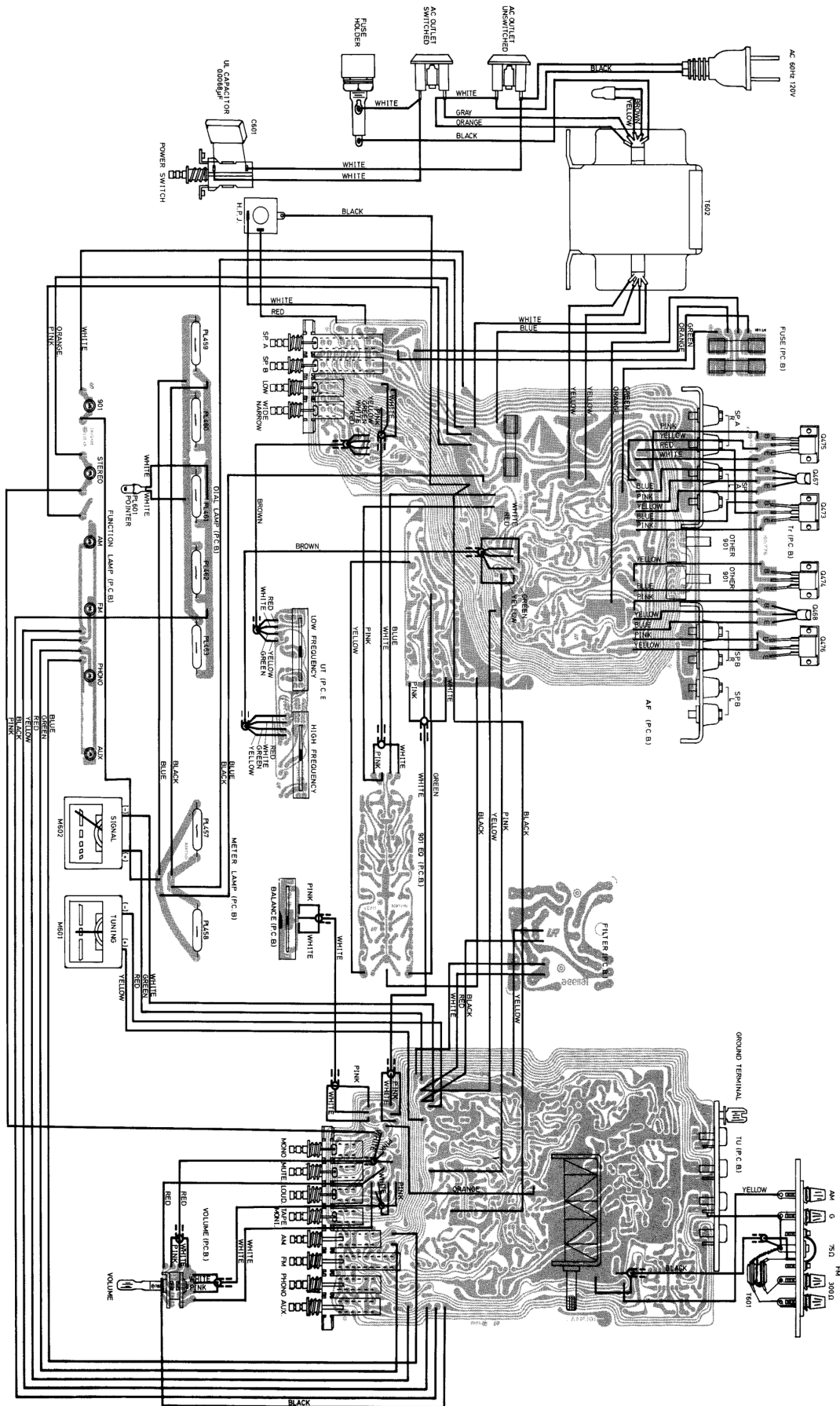


Figure 5. Wiring Diagram



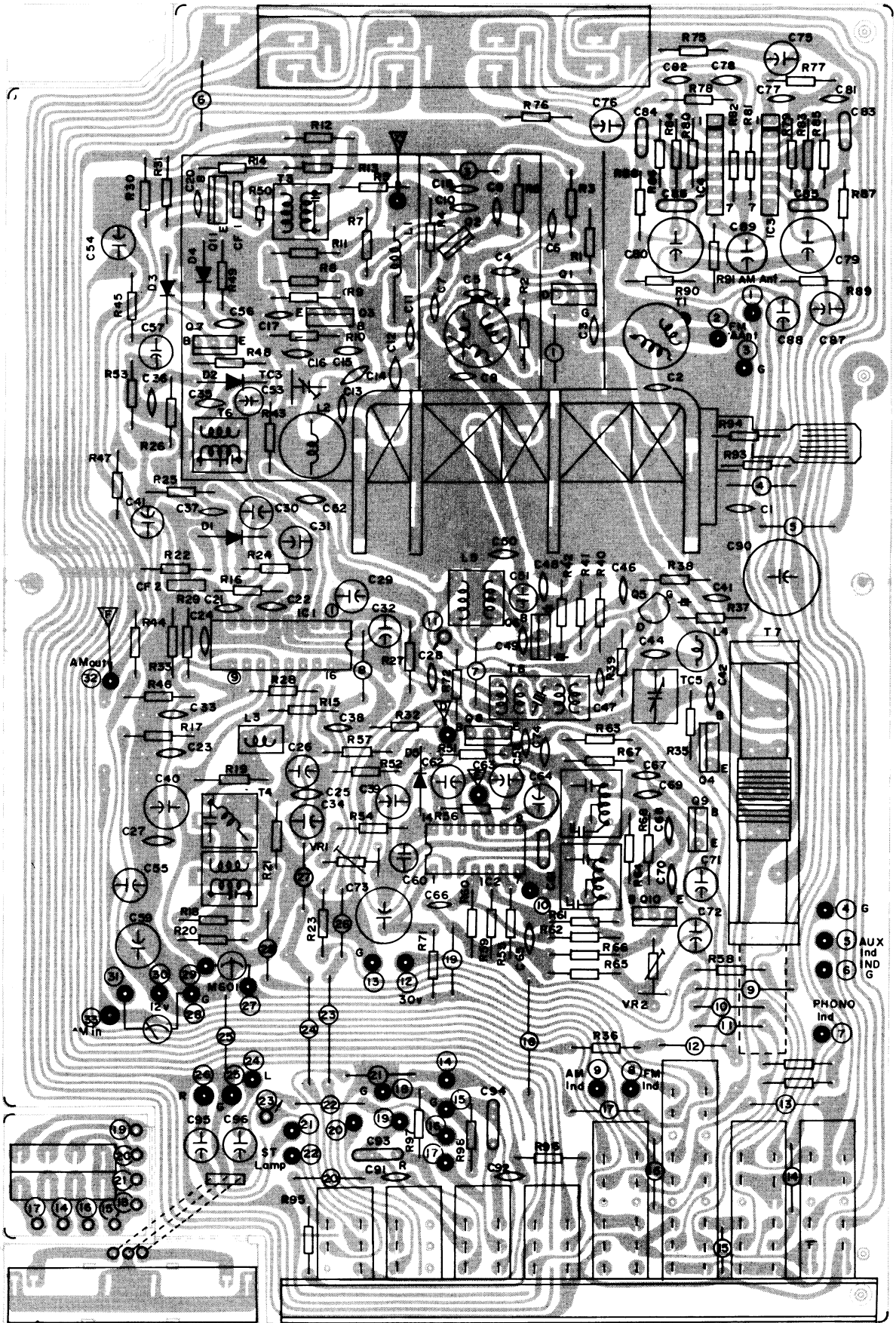


Figure 6. Main PCB Layout



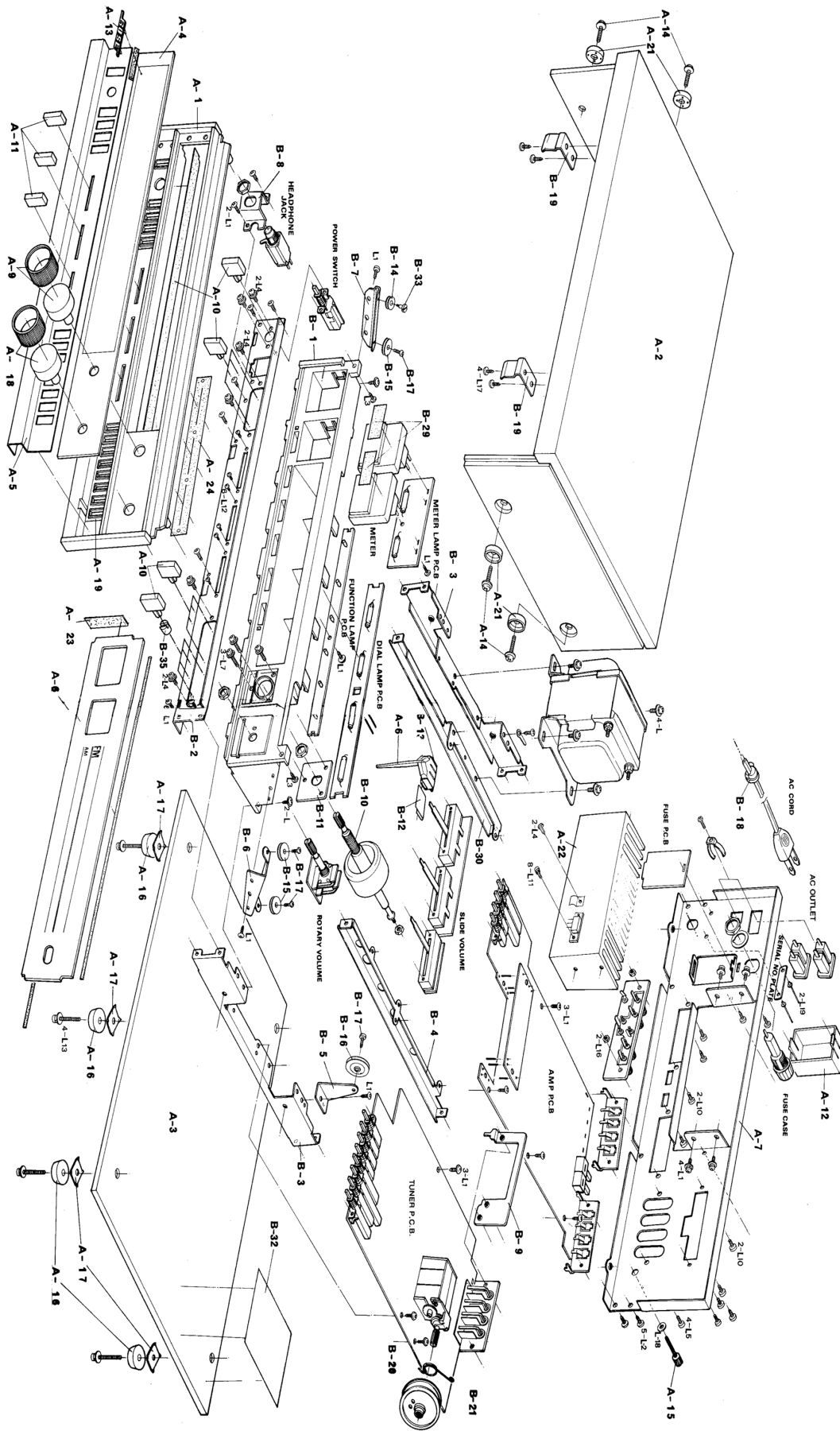


Figure 8. Exploded View

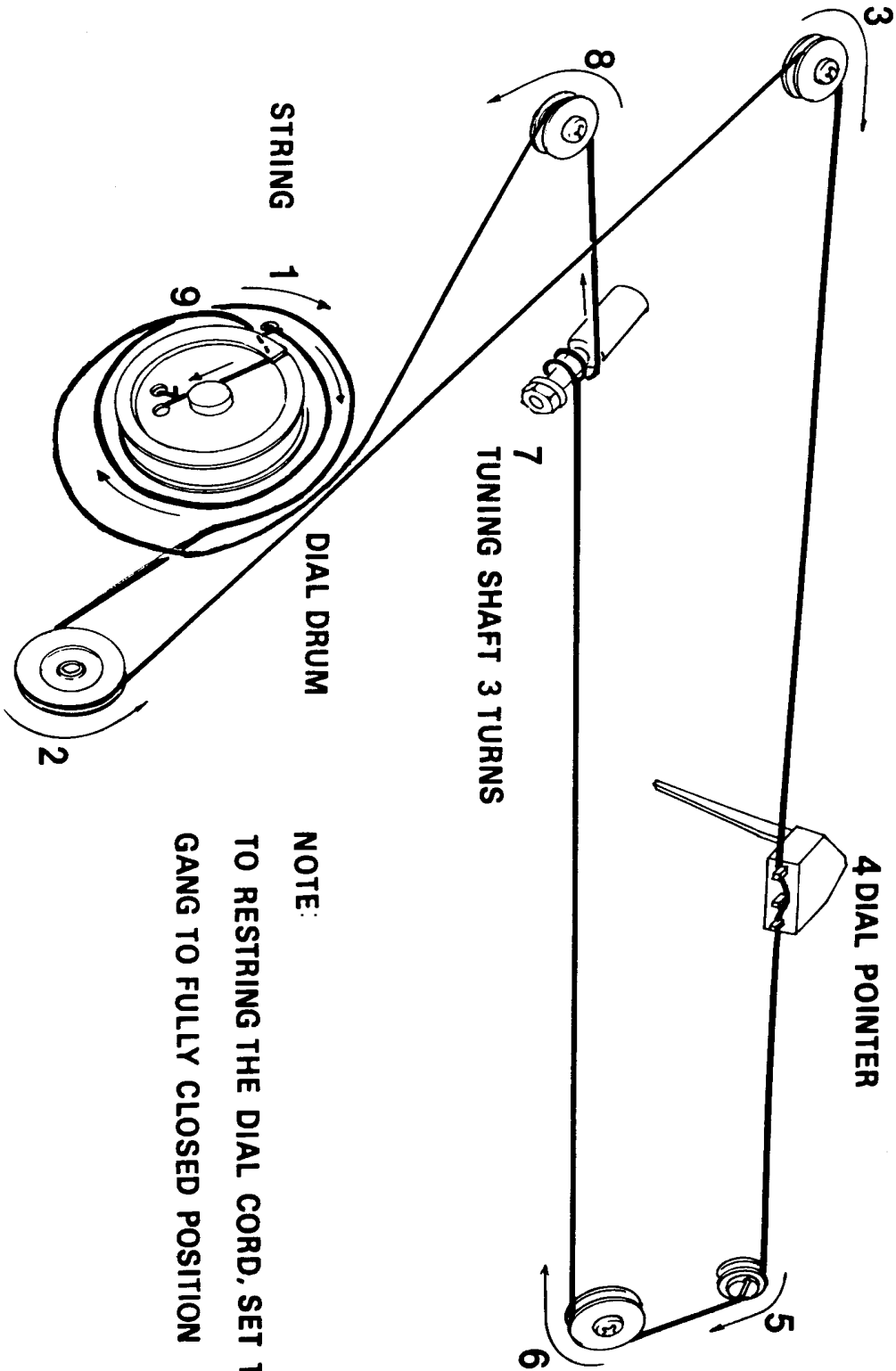


Figure 9. Dial String Diagram

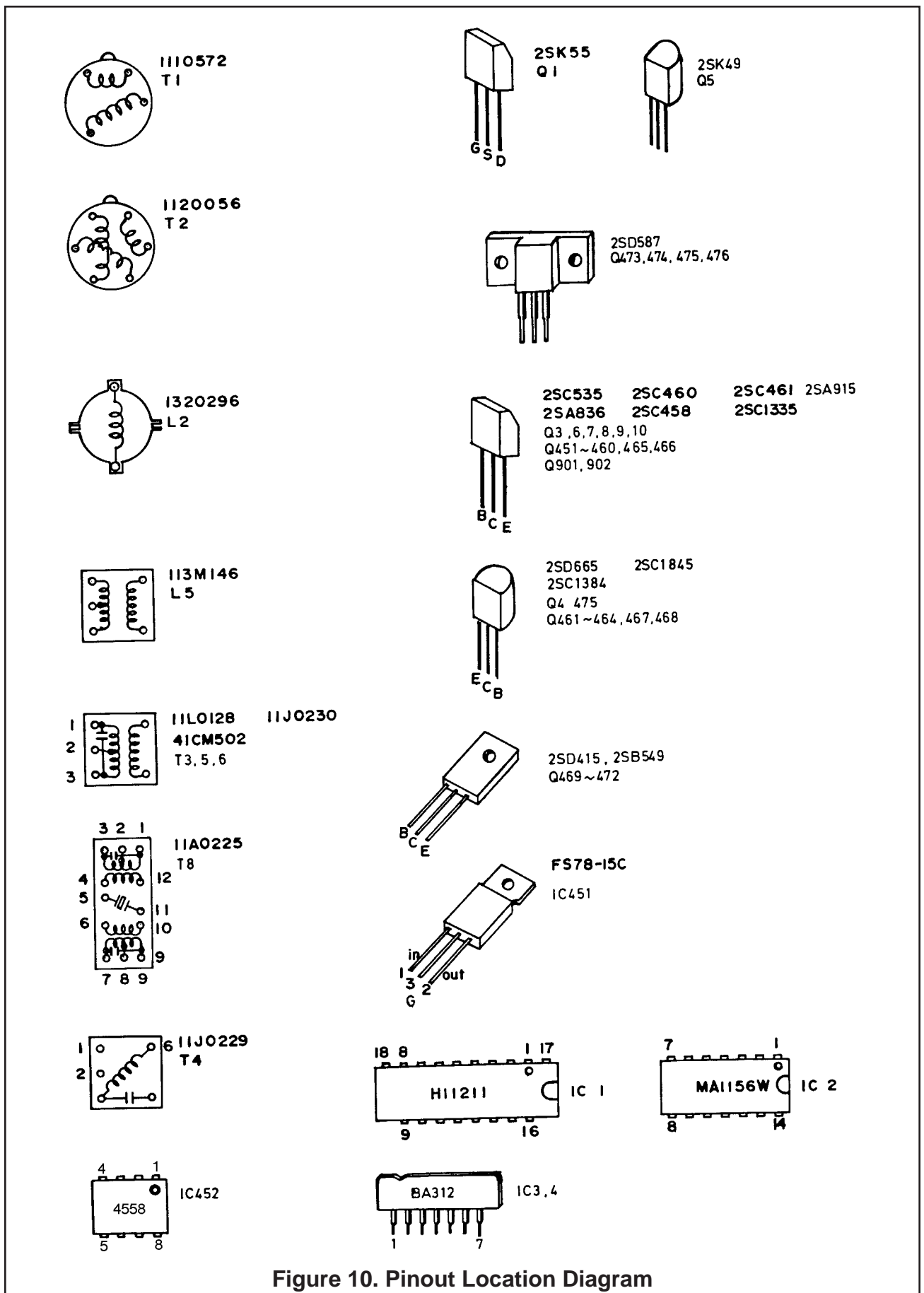



Figure 10. Pinout Location Diagram

## PART LIST NOTES

1. This part is not normally available from Customer Service. Approval from the Field Service Manager is required before ordering.

2. The individual parts located on the PCBs are listed in the Electrical Parts Lists.

3.  This part is critical for safety purposes. Failure to use a substitute replacement with the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards.

# PART LIST

Main Assembly (see Figure 8)

Item Number	Description	Part Number	Note
A-1	Front Panel Assembly	112889	
A-2	Cabinet	112344	
A-3	Bottom Plate	112890	
A-4	Dial Window	112345	
A-5	Control Panel	112346	
A-6	Pointer	112347	
A-7	Terminal Chassis	112891	
A-8	Dial Scale	112892	
A-9	Tuning Knob	112277	
A-10	Push Knob	112228	
A-11	Slide Knob	112229	
A-12	Fuse Cover	112348	
A-13	Badge, Logo	112349	
A-14	Screw, Cabinet	112350	
A-15	Screw, Ground	112351	
A-16	Foot, Cabinet	109820	
A-17	Chassis Holder	112352	1
A-18	Volume Knob	112276	
A-19	Knob, Guide	112353	
A-20	Dial Window Cover	112893	
A-21	Chassis Holder Bushing	112354	
A-22	Heat Sink	112894	1
A-23	Dial Side Cover	112895	
A-24	Slide Pot Cover	112896	
B-1	Chassis Front	112897	1
B-2	Control Chassis	112898	
B-3	Joint Chassis	112899	1
B-4	Sub. Chassis (A)	112900	
B-5	Pulley Holder (A)	112903	
B-6	Pulley Holder (B)	112902	
B-7	Pulley Holder (C)	112903	
B-8	Headphone Holder	112904	1
B-9	Terminal Holder	112905	
B-10	Tuning Shaft Assembly	112906	1
B-11	Sleeve Holder	112907	
B-12	Pointer Tape	109848	1
B-13	Pointer Base	109839	1
B-14	Tuning Pulley (C)	112908	
B-15	Pulley	109841	
B-16	Pulley	112909	
B-17	Pulley Screw	112910	
B-18	Cord Stopper	109843	
B-19	Cabinet Holder, Metal	112911	1

# PART LIST

Main Assembly (see Figure 8)

Item Number	Description	Part Number	Note
B-20	Drum	112912	1
B-21	Drum Spring	112913	1
B-22	Shaft Washer	109842	1
B-30	Sub. Chassis (B)	112914	1
B-32	Shield Paper (B)	112915	1
B-33	Pulley Stud (A)	112916	1
B-34	Ground Lug	112357	
B-35	Switch Cushion	112917	
L-2	Screw, M3-8 Tapping, Black	112919	
L-12	Screw, M2-4, Slide Pot	112930	
L-13	Screw, M4-20	112930	

Miscellaneous

Reference Designator	Description	Part Number	Note
M601	Tuning Meter	112173	
M602	Signal Meter	112172	
PL451-456	65mA/6.3V	112126	
PL457-458	150mA/6.3V	112296	
PL459-463	200mA/6.3V	109856	
PL601	65mA/6.3V	112306	
T602	Power Transformer	112299	
SW1	Push Switch	112326	
SW2	Power Switch	112303	
SW451, 452	Slide Switch	112176	
SW453	Push Switch	112308	
	8P Jack	112328	
	Headphone Jack	109870	
	Antenna Terminal	112362	
	F Type Terminal	114125	
	Output Terminal	112309	
	AC Cord	112304	
	AC Outlet	109866	
	Fuse Holder	112159	
F451,452	Fuse 250V/4A	112311	
F601	Fuse 250V/2.5A	112305	
F453	Fuse 250V/2A	112181	
	Fuse Holder	112366	
	Lamp Holder	112165	
	PCB Holder	112325	
	Ferrite Bead	109918	
	Shield Plate (A)	114094	
	Shield Plate (B)	109912	



### Variable Resistors

Reference Designator	Description	Part Number	Note
VR1	5k (19kHz pilot)	112343	
VR2	20k (seperation)	112247	
VR451, 452	3k (amp current pot)	112324	
VR3,4	250k (volume)	112329	
VR5	250k (balance)	112330	
VR453-456	25K (bass and treble)	112310	

### Resistors

Reference Designator	Description	Part Number	Note
R1, 37, 549,550	1m $\Omega$ (J) carbon	113282	
R2,7,12,17,58,71	22 $\Omega$ (J) carbon	113284	
R3	220 $\Omega$ (J) carbon	113349	
R4, 13, 49, 51, 63, 64	3.3k $\Omega$ (J) carbon	107157-332	
R5	18k (J) carbon	113367	
R6, 14, 26, 31, 42, 56, 481, 482, 547, 548, 908	1k $\Omega$ (J) carbon	113238	
R8, 35, 91, 95, 96, 543, 544	15k $\Omega$ (J) carbon	113347	
R9, 19, 21, 32, 517, 518, 905	10k $\Omega$ (J) carbon	113288	
R10, 551, 552	3.9k $\Omega$ (J) carbon	113354	
R11, 47	100 $\Omega$ (J) carbon	113285	
R15, 29	47k $\Omega$ (J) carbon	113343	
R16, 20, 30, 50	330 $\Omega$ (J) carbon	113290	
R18, 515, 516	1.8k $\Omega$ (J) carbon	113345	
R22, 72, 483, 484	150k $\Omega$ (J) carbon	113283	
R23, 513, 514	68k $\Omega$ (J) carbon	114085	
R24	36k $\Omega$ (J) carbon	114086	
R25, 40, 541, 542	39k $\Omega$ (J) carbon	113320	
R27, 501, 502, 505-508	12k $\Omega$ (J) carbon	113346	
R28, 52, 61, 77, 78, 491, 492	2.2k $\Omega$ (J) carbon	107170-222	
R33, 46	33k $\Omega$ (J) carbon	113322	
R36, 903, 904	22k $\Omega$ (J) carbon	113341	
R38, 523, 524	4.7k $\Omega$ (J) carbon	113377	
R39, 485, 486	270k $\Omega$ (J) carbon	114087	
R41, 89, 90, 487-490, 521, 522, 525, 526	6.8k $\Omega$ (J) carbon	113289	
R43	560 $\Omega$ carbon	113352	
R44, 53, 527, 528, 902	5.6k $\Omega$ (J) carbon	114088	
R45	1.5k $\Omega$ (J) carbon	113321	

# PART LIST

## Resistors

Reference Designator	Description	Part Number	Note
R48	220k $\Omega$ (J) carbon	113318	
R54	16k $\Omega$ (J) carbon	114089	
R55	4.7 $\Omega$ (J) carbon	114090	
R57, 79, 80, 93, 479, 480, 497, 498,	100k $\Omega$ (J) carbon	113281	
R59, 60, 67, 68	2.7k $\Omega$ (J) carbon	113340	
R65, 66	820 $\Omega$ (J) carbon	113383	
R75, 76	82k $\Omega$ (J) carbon	113350	
R81, 82	330k $\Omega$ (J) carbon	114091	
R83, 84	1.3k $\Omega$ (J) carbon	114092	
R85, 86	62k $\Omega$ (J) carbon	113399	
R87, 88	750k $\Omega$ (J) carbon	114093	
R97, 98	5.1k $\Omega$ (J) carbon	113375	
R451-454	1.2k $\Omega$ (G) carbon	113386	
R455, 456	3.3k $\Omega$ (G) carbon	113385	
R457, 458	3.6k $\Omega$ (G) metal film	113388	
R459, 460	4.32k $\Omega$ (F) metal film	112203	
R461, 462	13k $\Omega$ (G) carbon	113389	
R463, 464	160k $\Omega$ (G) carbon	113391	
R465, 466	82k $\Omega$ (G) carbon	113390	
R467, 468	2.7k $\Omega$ (G) carbon	113392	
R469, 470	2.4k $\Omega$ (G) carbon	113393	
R471, 472	68k $\Omega$ (G) carbon	113394	
R473, 474	750 $\Omega$ (G) carbon	113397	
R475, 476	510 $\Omega$ (G) carbon	113396	
R477, 478	1k $\Omega$ (G) carbon	113395	
R493, 494	110 $\Omega$ (J) carbon	114119	
R495, 496, 906	1.2k $\Omega$ (J) carbon	113323	
R499, 500	2.2 1w (J) metal film	114120	
R503, 504, 511, 512, 562	8.2k $\Omega$ (J) carbon	113379	
R509, 510	24k $\Omega$ (J) carbon	113380	
R519	4.7k $\Omega$ 1w (K) metal oxide	112317	
R529, 530, 533, 534	180 $\Omega$ 1w (J) metal oxide	112320	
R531, 532	10 $\Omega$ (J) carbon	113351	
R535-538	.47 $\Omega$ 5w (J) cement	112323	
R539, 540	22 $\Omega$ 2w (K) metal oxide	112226	
R545, 546	9.1k $\Omega$ (J) carbon	114123	
R553, 554	390k $\Omega$ (J) carbon	113382	
R555, 556	3.3k $\Omega$ 1w (K) metal oxide	112319	
R557, 558	150 $\Omega$ (J) fuse resistor	112318	

## Resistors

Reference Designator	Description	Part Number	Note
R559, 560	330 $\Omega$ 1w (J) metal oxide	112321	
R561	47 $\Omega$ 1/2w (J) carbon	113251	
R563, 564	82 $\Omega$ 2w (J) metal oxide	112322	
R565	18 $\Omega$ (J) carbon	114122	
R566-570	220 $\Omega$ (J) carbon	113256	
R571	27k $\Omega$ (J) carbon	113286	
R601	3.3m $\Omega$ 1/2w (K) Solid	110888	
R901	22k $\Omega$ (J) carbon	113341	
R907	680k $\Omega$ (J) carbon	114101	

## Capacitors

Reference Designator	Description	Part Number	Note
VC1-5	Variable Capacitor	112361	
C1, 6, 9, 18, 20, 46, 48, 52, 74	0.022 (YZ) Ceramic	114069	
C2	10P (N470) Ceramic	109928	
C3	33P (J) Ceramic	113357	
C4	1P (NPO) Ceramic	109935	
C5, 11,12	2P (NPO) Ceramic	109935	
C7, 43	6P (J) Ceramic	114077	
C8	15P (N470) Ceramic	109934	
C10	100P (J) Ceramic	109939	
C13	16P (N470) Ceramic	114072	
C14	10P (NPO) Ceramic	109932	
C15	30P (NPO) Ceramic	109937	
C17, 21-25, 27, 33, 47	0.047 (YZ) Ceramic	114071	
C26	0.33/16V Electrolytic	114073	
C28, 36, 49	0.01 (YB) Ceramic	113270	
C29, 30	3.3/16V Electrolytic	113297	
C31, 34	1/16V Electrolytic	114074	
C32	6.8/16V Electrolytic	114075	
C35	470P (YB) Ceramic	113356	
C38	330P (J) Ceramic	113304	
C39	4.7/16V Electrolytic	113301	
C40, 54, 59, 73, 536	47/16V Electrolytic	109962	
C41	1/25V Electrolytic	112271	
C42, 58	180P (J) Ceramic	114076	
C44, 517, 518	22P (J) Ceramic	113310	
C50	15P (N2200) Ceramic	114078	
C51	350P (J) Polyester	109956	
C53, 55, 529, 530	10/16V Electrolytic	113303	
C56	470P (YB) Ceramic	113356	

# PART LIST

## Capacitors

Reference Designator	Description	Part Number	Note
C60	470P (J) Polyster	109945	
C61	.047 (M) Polyster	112222	
C62	.47/25V (LL) Electrolytic	114079	
C63, 64	.22/25V (LL) Electrolytic	114080	
C65-68	.0056 (YB) Ceramic	100397-7	
C69, 70	.001 (YB) Ceramic	100397-3	
C71, 72, 75, 76, 87, 88, 95, 96, 477, 478	4.7/35V (LL) Electrolytic	114081	
C77, 78	56P (J) Ceramic	113295	
C79, 80	470/6.3V Electrolytic	114082	
C81, 82	330P (J) Ceramic	113304	
C83, 84	.0012 (J) Polyster	112274	
C85, 86	.0043 (J) Polyster	112340	
C89	10/35V Electrolytic	114083	
C90	100/35V Electrolytic	109969	
C91, 92	150P (J) Ceramic	114084	
C93, 94	.12 (M) Polyster	112342	
C451, 452, 457, 458, 463-466	.022 (J) Polyster	109972	
C453, 454	.15 (J) Polyster	112197	
C455, 456	.22 (J) Polyster	112198	
C459, 460	.33 (J) Polyster	112199	
C461, 462	.015 (K) Polyster	114105	
C467, 468, 491, 492, 535	.01 (YZ) Ceramic	109931	
C469, 470	.0068 (G) Polyster	112202	
C471, 472	.0012 (G) Polyster	112201	
C473, 474, 489, 490, 511, 512	330P (K) Ceramic	109944	
C475, 476	27P (J) Ceramic	113280	
C479, 480	100/35V (LL) Electrolytic	114106	
C481, 482, 485, 486	10Pf (K) Ceramic	109964	
C483, 484	100Pf (K) Ceramic	109939	
C487, 488	220/16V Electrolytic	114106	
C493, 494	22/35V (LL) Electrolytic	114107	
C495, 496	220/25V (LL) Electrolytic	114108	
C501, 502	.27 (K) Polyster	112314	
C503, 504	.0012 (K) Polyster	112312	
C505, 506	47/25V Electrolytic	114110	
C507, 508	.047 (YZ) Ceramic	114071	
C509, 510	150Pf (K) Ceramic	114110	
C513	33/16V Electrolytic	113412	
C515, 516	470Pf (K) Ceramic	114111	
C519, 520	2Pf (D) Ceramic	114112	
C521, 522	100/50V Electrolytic	114113	

# PART LIST

## Capacitors

Reference Designator	Description	Part Number	Note
C523, 524, 541,542	.047 (M) Polyester	112313	
C525, 526	100/25V Electrolytic	114114	
C527, 528	.33 (K) Polyester	112315	
C531, 532	.0022 (K) Polyester	112313	
C533, 534	470/16V Electrolytic	113407	
C537	1000/35V Electrolytic	114115	
C538	220/50V Electrolytic	114116	
C539, 540	6800/50V Electrolytic	114117	
C543, 544	1000/16V Electrolytic	113364	
C549, 550	47/50V Electrolytic	114118	
C601	.0068	112363	
C902, 904	.0018 (J) Polyester	109967	
C903	.0036 (J) Polyester	114126	
C905	1/25V Electrolytic	114127	

## Transistors

Reference Designator	Description	Part Number	Note
Q1	FET 2SK55	109879	
Q2	2SC535	109880	
Q3	2SC461	109881	
Q4	2SD655	112300	
Q5	FET 2SK49	112298	
Q6, 7, 11	2SC460	112241	
Q8, 901	2SC458	109885	
Q9, 10, 451, 452, 457, 458	2SA836	109887	
Q453-456, 459, 460, 902	2SC1335	109888	
Q461-464	2SC1845	112284	
Q465, 466	2SA1915	112285	
Q467, 468	2SC945	112288	
Q469, 470	2SD415	112286	
Q471, 472	2SB549	112287	
Q473-476	2SD587	112283	
Q477	2SC1384	112289	

# PART LIST

## Integrated Circuits

<b>Reference Designator</b>	<b>Description</b>	<b>Part Number</b>	<b>Note</b>
IC1	HA11211 (FM IF)	112114	
IC2	HA1156W (MPX)	112294	
IC3, 4	BA312 (PRE AMP)	112295	
IC451	FS78 15C (ZENER IC)	112290	
IC452	4558D (OP AMP)	110369	

## Diodes

<b>Reference Designator</b>	<b>Description</b>	<b>Part Number</b>	<b>Note</b>
D1, 5	1S2787	112301	
D2, 3, 4	1K261	112302	
D451-454	1SR17-200	112291	
D455, 456	WO-6B	109896	
D457	WZ090 (ZENER)	112292	
D458, 459	WZ140 (ZENER)	112293	

# VOLTAGE CONVERSION INSTRUCTIONS

Refer to Figures 11 and 12 for the following procedures

## 120 to 240 Voltage Conversion

1. Locate the brown and yellow power transformer wires, remove the crimp insulator, and separate the wires.
2. Tape or insulate the brown wire (this wire is not used for 240 volt wiring, but it will be needed to convert back to 120 volt wiring).
3. Cut or unsolder the orange wire at the switched outlet and connect it to the yellow wire. Tape or insulate the connection.
4. Replace any tie-wraps that were removed from the wiring harness.
5. Replace the line fuse with a 1.5 amp 250 volt fast blo fuse.
6. Add a label to the rear panel indicating the voltage conversion to 240 volts.

## 240 to 120 Voltage Conversion

1. Locate the orange and yellow power transformer wires, remove the crimp insulator, and separate the wires.
2. Solder the orange wire to the switched AC outlet terminal with the gray transformer wire connected to it.
3. Locate the brown wire and remove the crimp insulator or tape.
4. Connect the yellow and brown wires together and tape or insulate the connection.
5. Replace any tie-wraps that were removed from the wiring harness.
6. Replace the line fuse with a 2.5 amp 250 volt fast blo fuse.
7. Remove the 240 volt label on the rear panel of the unit indicating the voltage conversion.

## FM 50 Microsecond De-Emphasis Change

1. Change R61, R62 from 2.2k to 1k ohms.
2. Change R63, R64 from 3.3k to 2.2k ohms.
3. Remove C65 and C66 (.0056 uF).
4. Change C67, C68 from .0056 to .0033 uF.
5. Change C69, C70 from .0015 to .0068 uF.

To Convert to 75 Microsecond De-Emphasis reverse the above Procedure.