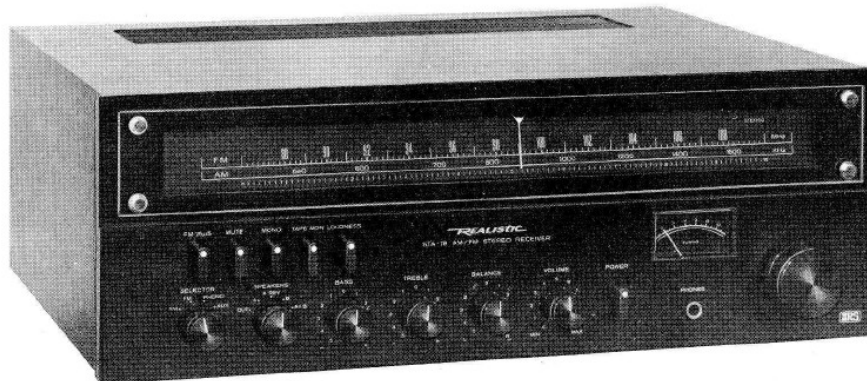


REALISTIC[®]

Service Manual

31-2077

STA-78
AM/FM STEREO RECEIVER
Catalog Number : 31-2077



CUSTOM MANUFACTURED FOR RADIO SHACK  A DIVISION OF TANDY CORPORATION

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Note:

The supply voltage is 120 volts AC (for UL & C.S.A.) and 240 volts AC for Australian models, from a regulated power supply.

The power source must be insulated from other equipment connected antenna or output. The room temperature is 25 degrees C.

Nominal Specs represent the design specs; all units should be able to approximate these – some will exceed and some may drop slightly below these specs.

Limit Specs represent the absolute worst condition which still might be considered acceptable; in no case should a unit perform to less than within any Limit Spec.

2. DISASSEMBLY INSTRUCTIONS

1) To remove Chassis from wooden cabinet.

Turn the cabinet upside down and remove the six screws from the bottom cabinet. (Figure A)

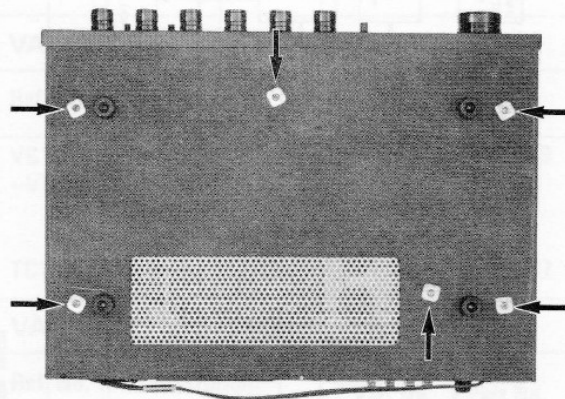


Figure A

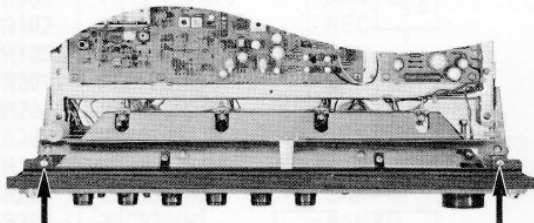


Figure B1

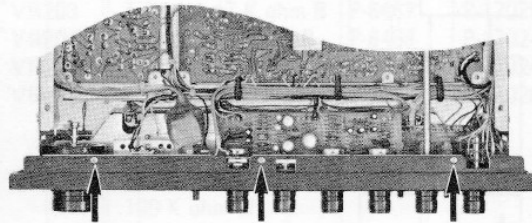


Figure B2

2) Removal of Front Panel.

- a) Remove the chassis from wooden cabinet as described in 1).
- b) Pull out the Main Chassis.
- c) Remove the two screws from the top and three screws from the bottom of the Front Panel.
- d) Remove knobs and pull off panel. (Figure B1, B2)

3) To remove Rear Panel from chassis.

Remove the four screws from the Rear Panel. (Figure C)

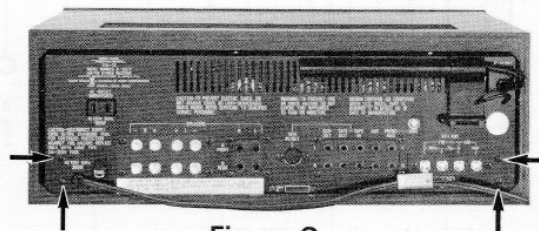
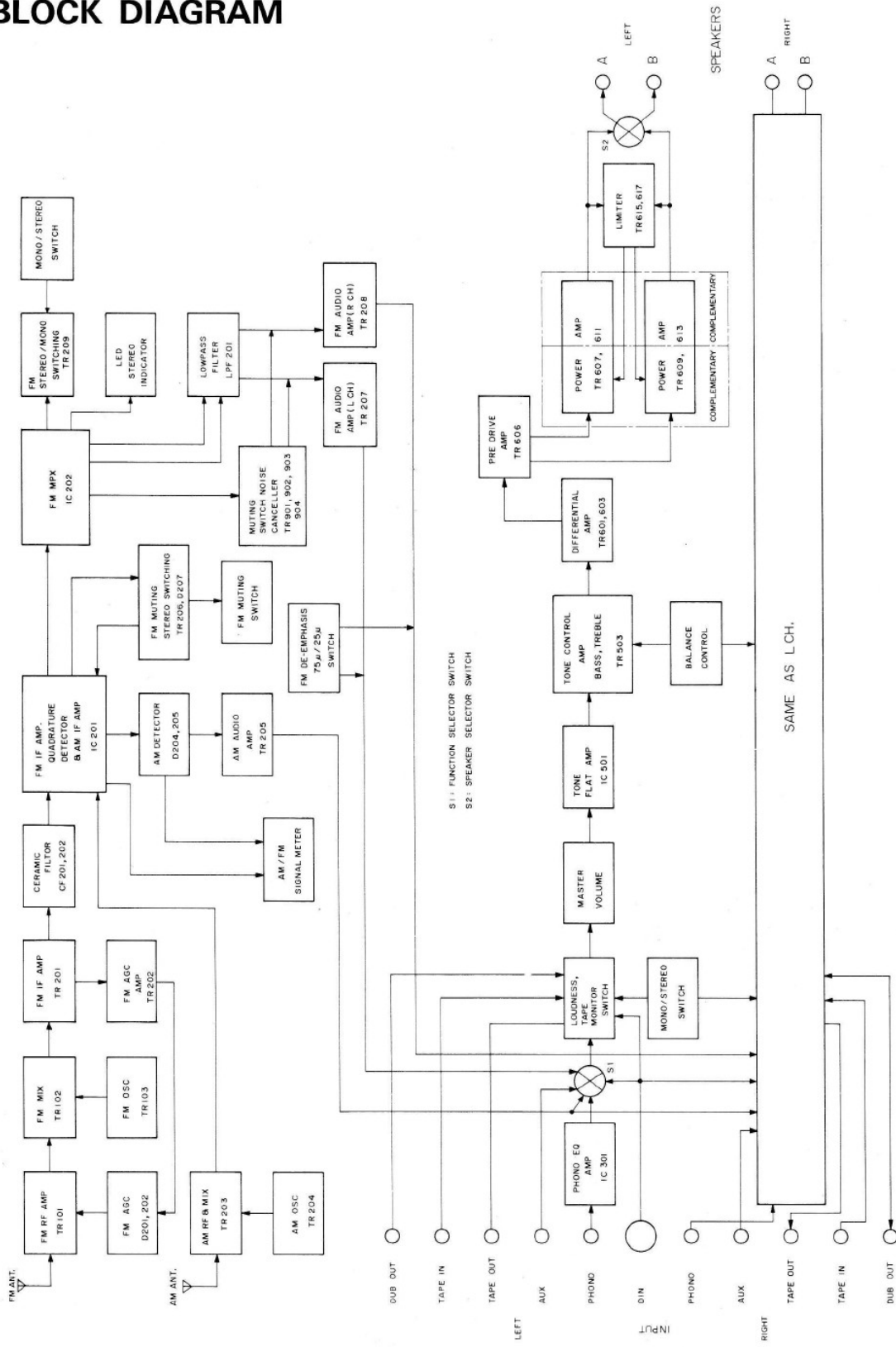
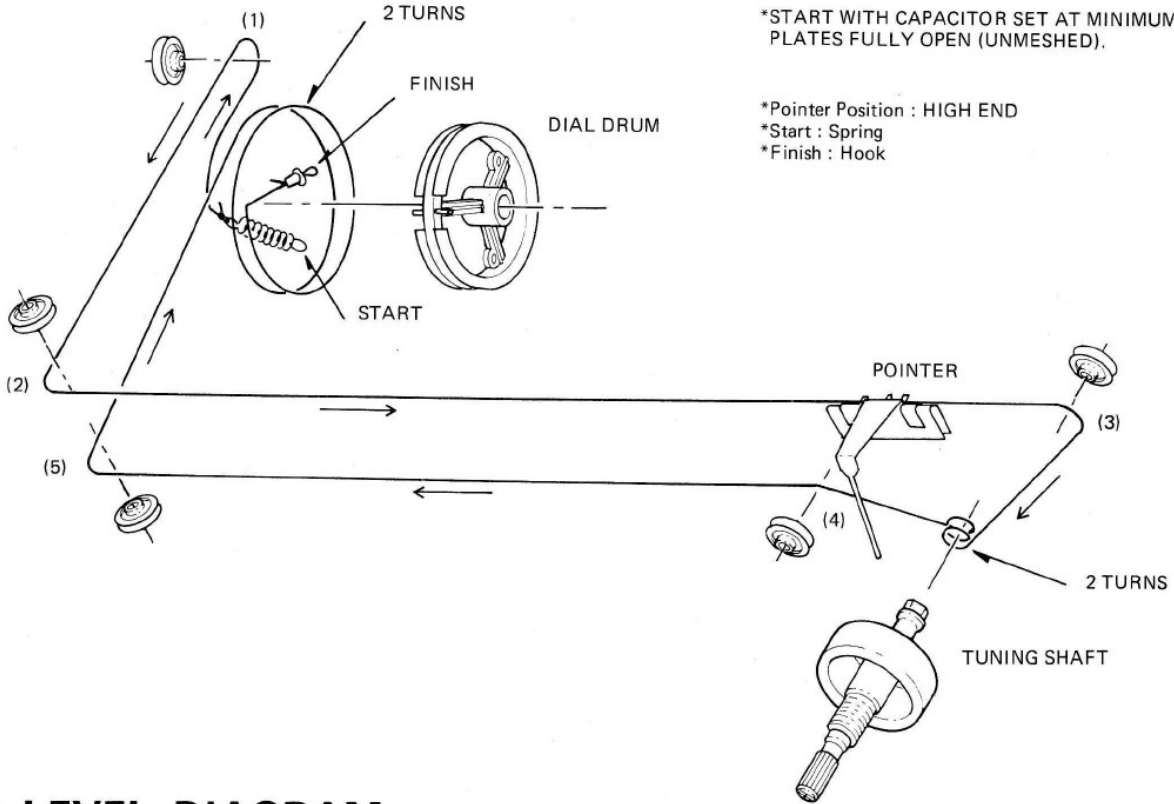


Figure C

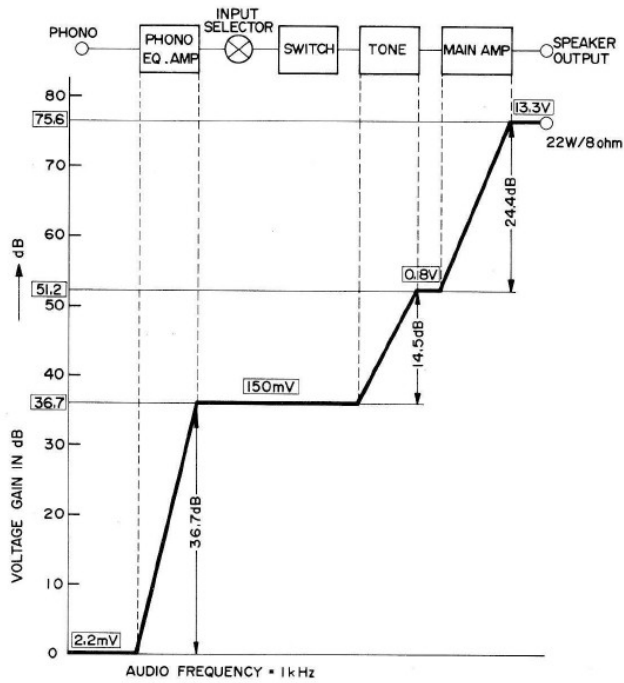
3. BLOCK DIAGRAM



4. DIAL STRINGING DIAGRAM



5. LEVEL DIAGRAM



6. ALIGNMENT INSTRUCTIONS

AUDIO CIRCUIT ADJUSTMENT / CHECK

EQUIPMENT REQUIRED

1. DC Voltmeter
2. Audio Oscillator
3. Oscilloscope
4. AC Voltmeter

Note: *Maintain voltage at 120 volts AC, 60 Hz (UL, CSA)
(240 volts, 50 Hz AC for Australian models).

*Set SELECTOR Switch to AUX.

*Set MODE Switch to STEREO.

*See P.C.B. illustration for alignment points/adjustments.

For location of connection points and trimmer resistors, see P.C.B. view.

MAIN AMP ADJUSTMENT

STEP	ADJUSTMENT	EQUIPMENT	CONNECTION	AUDIO FREQ.	LEVEL	ADJUSTMENT
1	Check Balance by measuring DC voltage across Output Terminal of L and R channel.	DC Volt Meter	See Figure 1.	No signal	DC voltage should be less than 25 mV.	
2	Idling current adjustment	DC Volt Meter	See Figure 2.	No signal	Adjust so voltage across Emitter resistors R633 and R634 is 5 mV (8 ohm load).	VR601 VR602

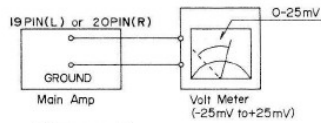


Figure 1

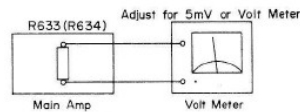


Figure 2

CHECKING LIMITER CIRCUIT

STEP	ADJUSTMENT	EQUIPMENT	CONNECTION	AUDIO FREQ.	SETTING	LEVEL
1		Audio Osc. V.T.V.M. Oscilloscope	See Figure 3.	1000 Hz	VOLUME: Max. BASS, TREBLE BALANCE: center	Adjust input to AUX to get output level at just the clipping point (4 ohm load) Figure 4.
2	Check the limiter circuit.	Audio Osc. V.T.V.M. Oscilloscope	See Figures 3, 5.	1000 Hz	Same as above	Check that output dropt to a square wave across R633 (R634) when output speaker terminals are shorted. See Figure 6.

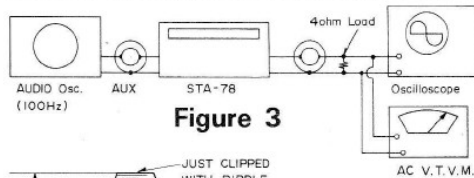


Figure 3

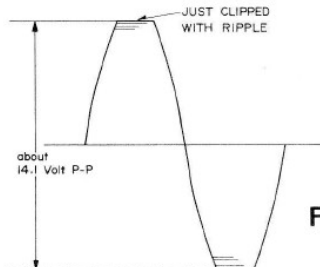


Figure 4

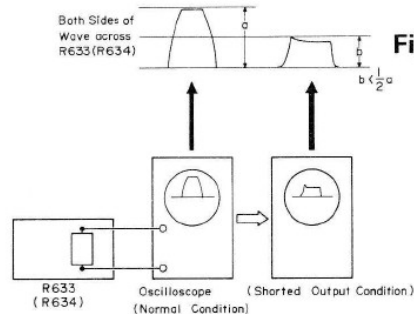


Figure 5

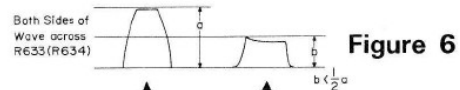


Figure 6

AM RF & IF ALIGNMENT

EQUIPMENT REQUIRED

1. AM Signal Generator
2. AC Voltmeter
3. Oscilloscope
4. Distortion Meter

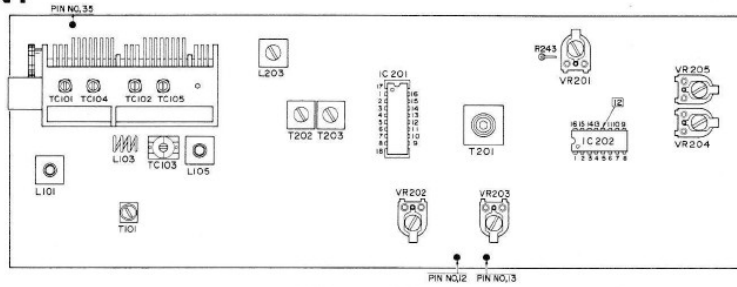


Figure 7

- Note:** *Signal generator output should be no higher than necessary to obtain an output reading.
 *Maintain line voltage at 120 volts, 60 Hz AC (UL & CSA) (240 volts, 50 Hz AC for Australian models).
 *Set SELECTOR Switch to AM.
 *See P.C.B. illustrations for alignment points/adjustments and Figure 7.

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUSTMENT	REMARKS
1	Connect standard loop ANTENNA to Signal Generator and radiate signal into the AM Ferrite Antenna. See Figure 8.	455 kHz (400 Hz, 30% mod.)	Point of non-interference (near 600 kHz)	Scope and AC Voltmeter to TAPE OUT Jack.	T202 T203 (AM IFT)	Adjust for maximum reading on meter.
2	Same as STEP 1.	510 kHz (400 Hz, 30% mod.)	Tuning Gang fully closed.	Same as STEP 1.	L203 (AM OSC Coil)	Adjust for maximum reading on meter. Refer to Figures 7 and 8.
3	Same as STEP 1.	1650 kHz (400 Hz, 30% mod.)	Tuning Gang fully opened.	Same as STEP 1.	TC105 (AM OSC Trimmer)	Adjust for maximum reading on meter. Refer to Figures 7 and 8.
4	Same as STEP 1.	600 kHz (400 Hz, 30% mod.)	600 kHz	Same as STEP 1.	L802 (AM ANT. Coil)	Adjust for maximum reading on meter. Refer to Figures 7 and 8.
5	Same as STEP 1.	1400 kHz (400 Hz, 30% mod.)	1400 kHz	Same as STEP 1.	TC104 (AM ANT. Trimmer)	Adjust for maximum reading on meter. Refer to Figures 7 and 8.
6	Repeat STEPs 4 and 5 until no further change is noticed.					
7	Same as STEP 1.	1000 kHz (400 kHz, 30% mod.) Output level to 100 mV/m	1000 kHz	AM Signal Meter on Set.	VR201	Adjust so the Meter Pointer on Receiver is at about 85% of full scale.

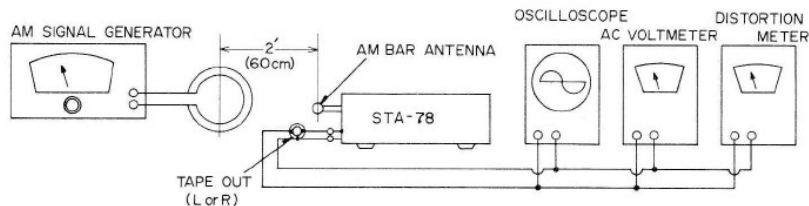


Figure 8

FM RF & IF ALIGNMENT

EQUIPMENT REQUIRED

1. FM Signal Generator
2. AC Voltmeter
3. Oscilloscope
4. Distortion Meter
5. Center Tuning Meter (1.2 K ohm, 200 μ A)

Note: *Signal Generator output should be no higher than necessary to obtain an output reading.
 *Maintain line voltage at 120 volts, 60 Hz AC (UL & CSA) (240 volts, 50 Hz AC for Australian models).
 *Set SELECTOR Switch to FM.
 *Refer to P.C.B. illustration and Figure 7 for test points/adjustments.

STEP	GENERATOR COUPLING	GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUSTMENT	REMARKS
1	Signal Generator to FM Antenna Terminal thru FM Dummy Antenna (300 ohm)	98 MHz (400 Hz, 75 kHz dev.) Input: about 2-3 μ V	Near 98 MHz	AC Voltmeter, Scope and Distortion meter to TAPE OUT Jack (L or R).	T101	Adjust for maximum reading on meter. Refer to Figure 11.
2	Same as STEP 1.	98 MHz (400 Hz, 75 kHz dev.) Input: no input (unit off)	Near 98 MHz	Connect the Center Tuning Meter (1.2 k Ω , 200 μ A) to Pin No. 12 (+) and No. 13 (-) on AM/FM IF Board (Refer to Figures 7 and 9A.)	T201 (Primary)	Adjust for Center point on Center Tuning Meter. Refer to Figures 9, 9A, 10 and 11.
3	Same as STEP 1.	98 MHz (400 Hz, 75 kHz dev.) Input: 1 mV	Same as STEP 1.	AC Voltmeter, Scope and Distortion Meter to TAPE OUT Jack (L or R).	T201 (Secondary)	Adjust for minimum Distortion (about 0.1%). Refer to Figure 9, 10 and 11.
4	Repeat STEPs 1, 2 and 3 until no further improvement is noticed.					
5	Same as STEP 1.	90 MHz (400 Hz, 75 kHz, dev.) Input: about 2-3 μ V	90 MHz	Same as STEP 1.	L101 (FM Antenna Coil) L103 (FM RF Coil - stretch or squeeze) L105 (FM OSC Coil)	Adjust for maximum reading on meter. Refer to Figures 7 and 11.
6	Same as STEP 1.	106 MHz (400 Hz, 75 kHz dev.) Input: about 2-3 μ V	106 MHz	Same as STEP 1.	TC 101 (FM Antenna Trimmer) TC102 (FM RF Trimmer) TC103 (FM OSC Trimmer)	Adjust for maximum reading on meter. Refer to Figures 7 and 11.
7	Repeat STEPs 5 and 6 until no further improvement is noticed.					
8	Same as STEP 1.	98 MHz (400 Hz, 75 kHz dev.) Input: 5 μ V	98 MHz	Same as STEP 1.	VR203	"MUTE" switched "ON" and adjust VR203 for no signal output.
9	Same as STEP 1.	98 MHz (400 Hz, 75 kHz dev.) Input: 100 mV	98 MHz	Signal Meter on Set.	VR202	Adjust so the Meter Pointer on Receiver is about 90% of full-scale.

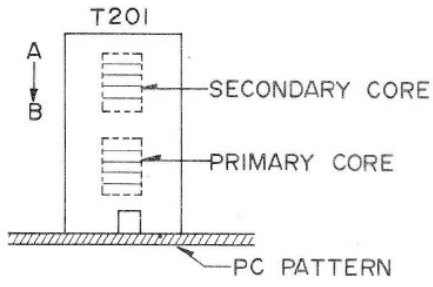


Figure 9

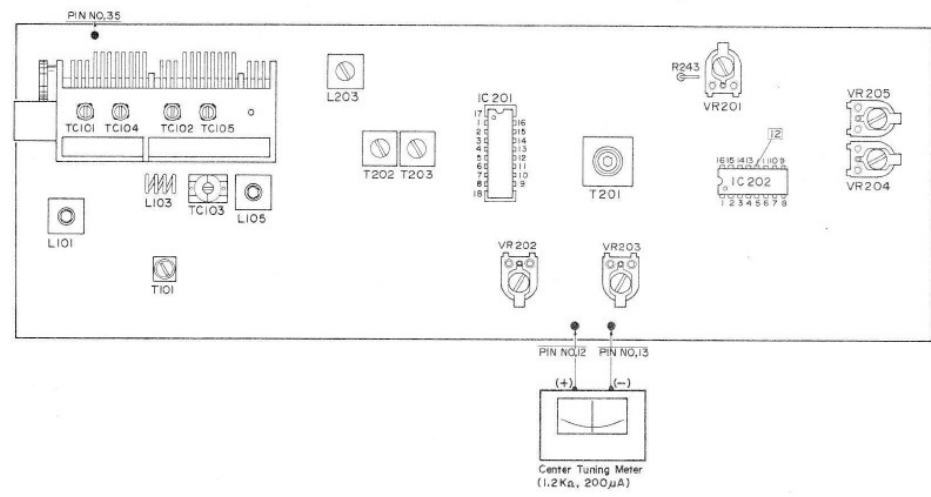
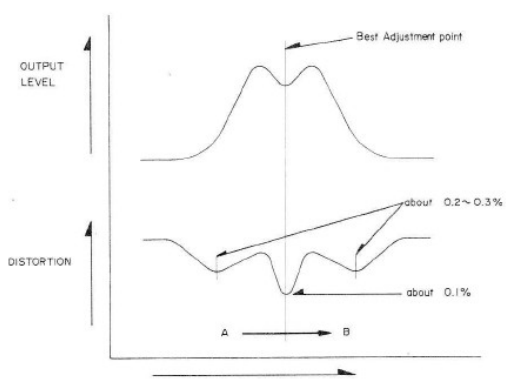


Figure 9A



CORE TURNING DIRECTION (Clockwise A-B, Re. Figure 9) (T201)

Figure 10

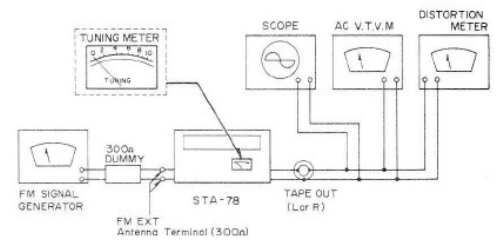


Figure 11

FM STEREO ALIGNMENT

EQUIPMENT REQUIRED

1. Stereo Modulation . . . Connect Stereo Modulator to EXT. Mod. terminal of FM Signal Generator.
Modulation Level of 19 kHz Pilot Signal . . . 8–10%.
2. FM Signal Generator . . . Output Level – 1 mV
Frequency – Approximately 98 MHz
Deviation – 75 kHz, 100% modulation of composite signal
3. Audio Generator
4. AC Voltmeter
5. Oscilloscope
6. Distortion Meter
7. Frequency Counter

Note: See P.C.B. illustration for alignment/test points.
Preliminaries
Set SELECTOR Switch to FM STEREO and MUTE Switch to "OFF" position.

MULTIPLEX & SEPARATION ALIGNMENT

STEP	SIGNAL GENERATOR COUPLING	STEREO MODULATION	INDICATOR	ADJUSTMENT	REMARKS
1	Connect to FM Antenna terminal thru FM dummy antenna (300 ohm).	Mono. 1 kHz (1000 Hz, No Mod.) Input: 1 mV	Counter connected to TP at Pin No. 12 of IC202.	VR205	Adjust for 19 kHz \pm 50 Hz on Counter. Refer to Figure 12.
2	Same as above.	Composite MPX Signal 1 kHz on Left channel ONLY.	AC Voltmeter connector for TAPE OUT Jack of Right Channel.	VR204 (Separation)	Adjust for minimum reading on meter. Refer to Figure 13.
3	Same as above.	Composite MPX Signal 1 kHz on Right channel ONLY.	AC Voltmeter connector for TAPE OUT Jack of Left Channel.	Same as above.	Same as above.
4	Repeat STEPs 2 and 3 until AC Voltmeter reading is at least –40 dB same channel output. (ie. 40 dB separation).				
5	Same as STEP 1.	Composite MPX Signal 1 kHz.	AC Voltmeter connected to TAPE OUT Jack.		With 5.5 μ V antenna input signal, Stereo indicator lamp should come on.

FM STEREO ALIGNMENT SET-UP

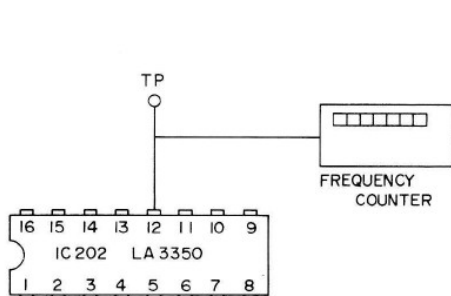


Figure 12

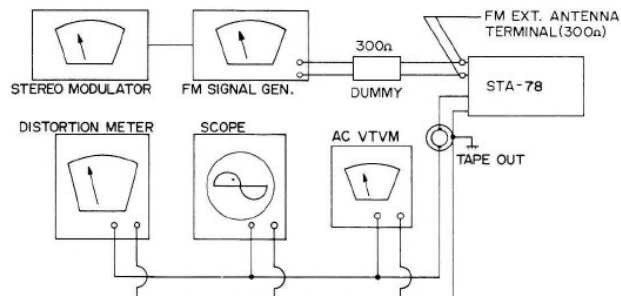


Figure 13

7. TROUBLESHOOTING

SYMPTOM	CAUSE / REMEDY
1) No output	1) Faulty AC power cord Replace the cord. 2) Defective POWER switch Replace the switch. 3) Broken wire in the Power Transformer Replace the Transformer. 4) Blown primary switch Replace the Fuse.
2) Pilot Lamp does not light.	1) Broken Lamp Replace the Lamp. 2) Open in the Power Transformer tertiary winding Replace the Transformer.
3) Pilot Lamp lights but no Speaker output.	1) Defective capacitor C802 or 803 Replace the defective capacitor(s). 2) Defective Rectifier D703 Replace the defective Rectifier. 3) Defect in the Power Transformer secondary winding Replace the Power Transformer.
4) Blows Fuse	1) Defective Rectifier D703 Replace the defective Rectifier. 2) Short-circuit in the rectifier circuit Remove the short. 3) Short-circuit in Power Transistor Circuitry TR611–614 Repair circuit and/or replace the defective Transistor(s).
5) "A" Speakers does not work.	1) Speaker Selector Switch defective Replace the switch. 2) Poor contact in Speaker Output Terminals Replace or repair it. 3) Poor contact in Speaker Selector Switch Repair or replace it.
6) "B" Speakers does not work.	1) Speaker Selector Switch defective Replace the switch. 2) Poor contact in Speaker Selector Switch Repair or replace it. 3) Poor contact in Speaker Output Terminals Repair or replace it.
7) No output one channel with VOLUME at maximum and BALANCE at center, when a test signal is applied to the terminal of non-operating channel of the BALANCE control VR502.	1) Defective Transistor TR501–503 or TR601–618 Replace the defective Transistor(s). 2) Defective resistor or capacitor of TONE and MAIN AMP circuit Replace the defective part(s).
8) No output when a test signal is applied to the input terminals, except PHONO input.	1) Defective MONO-Stereo or TAPE MONitor Switch Repair or replace the Switch. 2) Defective SELECTOR Switch Replace the Switch.
9) No output when a test signal is applied to the PHONO input terminals.	1) Defective transistor, resistor or capacitor of PRE EQ AMP circuit Replace the part(s). 2) Defective MONO-Stereo or TAPE switch Repair or replace the switch. 3) Defective SELECTOR Switch Replace the SELECTOR Switch.

SYMPTOM	CAUSE / REMEDY
10) Speaker works normally but Headphone does not work.	1) Defective R647 (Left) or R648 (Right) Change it. 2) Headphone plug does not mate with jack Replace the plug.
11) All the inputs work normally except "AUX" input.	1) Poor contact in "AUX" input jack Repair or replace it. 2) Poor contact in SELECTOR Switch Repair or replace the switch.
12) "PHONO" input inoperative	1) Poor contact in "PHONO" input jack Repair or replace it. 2) Faulty SELECTOR Switch Repair or replace it.
13) "TAPE OUT" inoperative	1) Poor contact in "TAPE OUT" output jack Repair or replace it.
14) "TAPE IN" inoperative	1) Poor contact in "TAPE IN" input jack Repair or replace the jack.
15) "DUB OUT" inoperative	1) Poor contact "DUB OUT" jack Repair or replace the jack.
16) No AM or FM (Tuner +B voltage is not 11-12 V.)	1) Broken tertiary winding in the Power Transformer Replace the Transformer. 2) Defective Diode D701 Change the defective diode. 3) Faulty capacitor C707, 711 or 713 Replace the defective capacitor(s). 4) Faulty resistor R705 or 707 Replace the resistor(s). 5) Zener Diode D704 defective Replace the Diode. 6) Short-circuit in Tuner +B circuit Repair the short. 7) Poor contact in SELECTOR Switch Repair or replace the Switch.
17) No FM	1) Poor contact in SELECTOR Switch Repair or replace it. 2) IC, Transistor, diode, resistor, capacitor, inductor or IFT of FM IF Board defective Replace the defective part(s). 3) FM Front End defective Replace the defective part(s). 4) Faulty FM Antenna lead-in/circuitry Repair or replace the Antenna lead-in/circuitry.
18) No AM	1) Poor contact in SELECTOR Switch Repair or replace Switch. 2) IC, Transistor, diode, resistor, capacitor or IFT of AM IF Board defective Replace the defective part(s). 3) Bar-Antenna Coil defective Repair or replace it.

SYMPTOM	CAUSE / REMEDY
19) No FM MPX Separation	1) Improper adjustment Readjust VR204 and 205. 2) IC202 of MPX board defective Replace the IC. 3) VR204, 205 defective Replace the Trimmer Resistor(s). 4) Defective Transistor TR207, 208 or 209 Replace the defective Transistor(s).
20) No STEREO light or FM Stereo does not work.	1) Broken STEREO Indicator Lamp Replace the lamp. 2) Defective IC202 of FM MPX Board Change the defective IC. 3) Defective Transistor TR207, 208 or 209 Replace the defective transistor(s). 4) VR204, 205 defective Replace the defective Trimmer Resistor(s).
21) "LOUDNESS" has no effect.	1) Defective "LOUDNESS" switch Replace the switch. 2) Defective C501, 502 or R501, 502 Replace the defective part(s).
22) "Stereo-MONO" not effective	1) Defective Stereo-MONO Switch Repair or replace the switch.
23) "MUTING" not effective	1) Defective MUTE Switch Repair or replace the switch. 2) Defective Transistor TR206 Replace the defective Transistor. 3) Defective Trimmer resistor VR203 Replace the Trimmer resistor. 4) Defective Diode D207 Replace the Diode. 5) Defective IC201 Replace the IC.
24) "FM 25 μ S" not effective	1) Defective FM 25 μ S switch Replace the switch. 2) Defective C403 or 404 Replace the defective part(s).
25) "TAPE MONITOR" does not operate.	1) Defective TAPE MONITOR switch Replace or repair the switch.
26) "BASS" has no effect.	1) Faulty VR504 (100 K ohm control) Replace it. 2) Defective C517-520 or R523-528 of TONE CONTROL Board Replace the defective part(s).
27) "TREBLE" has no effect	1) Faulty VR503 (100 K ohm control) Replace it. 2) Defective C513-516 or R517-522 of TONE CONTROL Board Replace the defective part(s).
28) "AM/FM SIGNAL METER" not functioning	1) Defective AM/FM Signal Meter Replace it.

SYMPTOM	CAUSE / REMEDY
	2) In case of FM reception, VR202, D206, C243, C244 or R240 defective Replace the defective part(s). 3) In case of AM reception, VR201, D204, R242 or C237-239 defective Replace the defective part(s). 4) Defective IC201 Replace the IC.

8. BRIEF DESCRIPTION OF PROTECTOR CIRCUIT

(1) Limiting Circuit

If speaker terminals are shorted, the output line (©line of Figure 14) is grounded and excessively high current flows from collector to emitter of TR611 (TR612) and TR613 (TR614), and a high voltage will appear across R633 (R634) and R635 (R636).

This high voltage goes to base of TR615 (TR616) and TR617 (TR618).

When the voltage between base and emitter increases to about 0.6 V, TR615 (TR616) and TR617 (TR618) will be turned on.

High current (input signal of TR607 [TR608] and TR609 [TR610]) flows from collector to emitter of TR615 (TR616) and TR617 (TR618) through D611 (D612) and D613 (D614), and collector to emitter current of TR611 (TR612) and TR613 (TR614) will drop as Figure 14 (from @to@', from ④ to ④') because of the output current limiting, and thus protect Power Transistors TR611 (TR612) and TR613 (TR614).

If this should occur, turn off the Receiver.

When the problem is corrected, turn the Receiver on again.

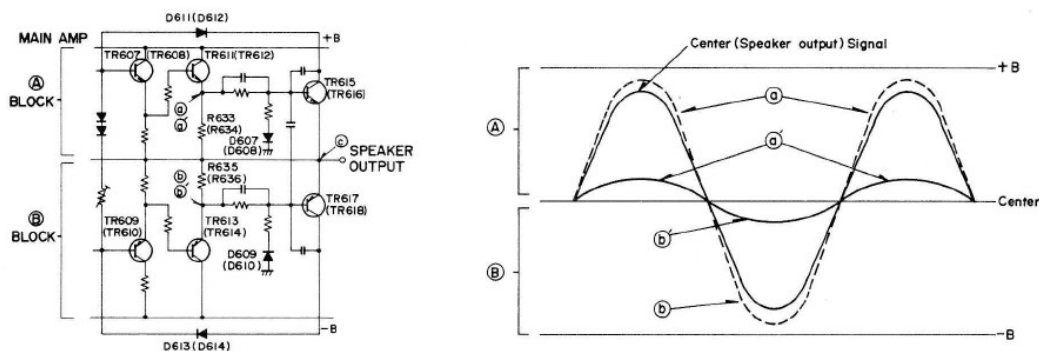


Figure 14

(2) Abnormal Temperature Rise Protection

If the temperature of the MAIN Amp Heat Sink rises to 90°C, the Thermal Protector Switch will activate to shut down A.C. Power to the entire Receiver and thus protect the MAIN Amp. If this should occur, turn the Receiver "OFF".

When the temperature of the MAIN Amp Heat Sink falls to within the operating limits of the Receiver, the Thermal Protector Switch will reset itself.

When the problem is corrected, turn the Receiver on again.

8. IC & TRANSISTOR LEAD IDENTIFICATIONS



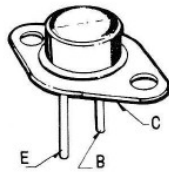
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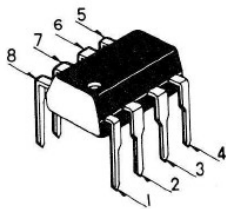
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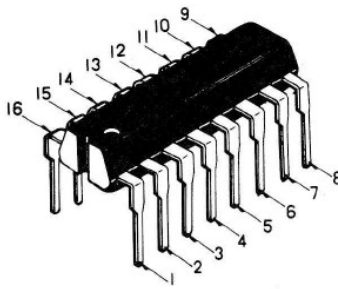
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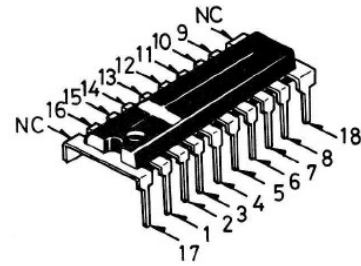
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NJM-4558



LA-3350

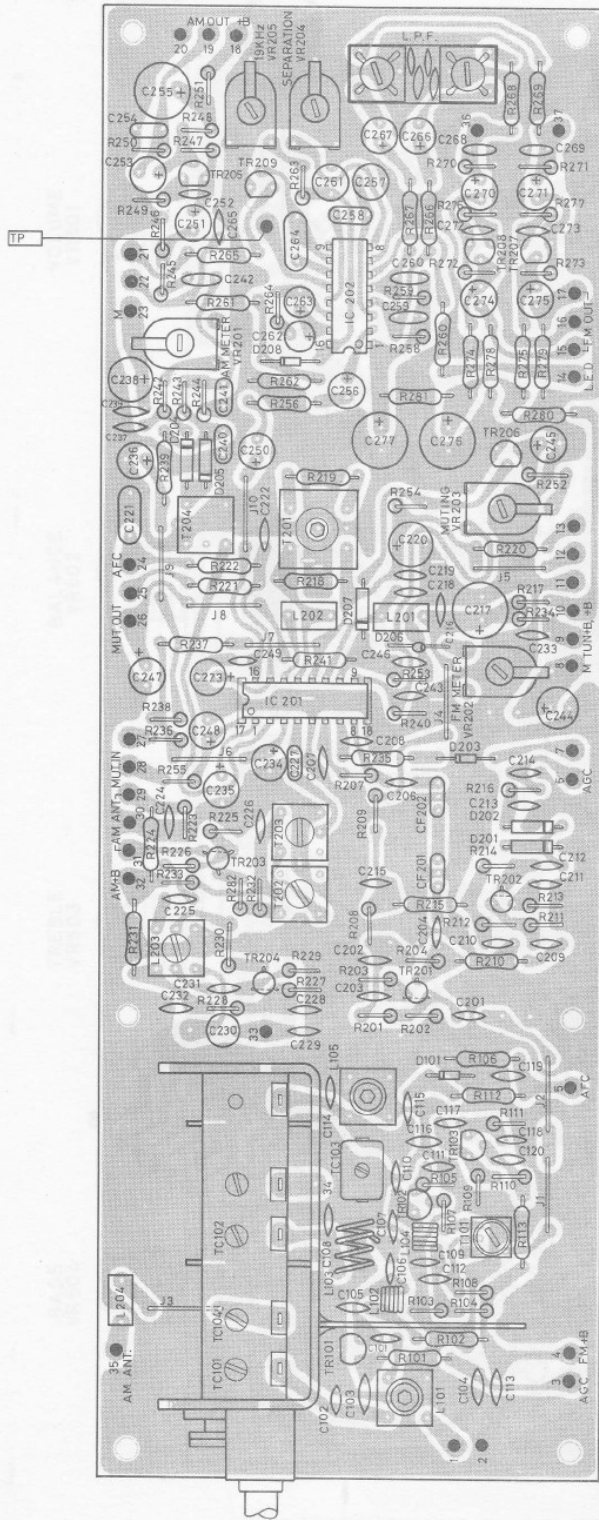


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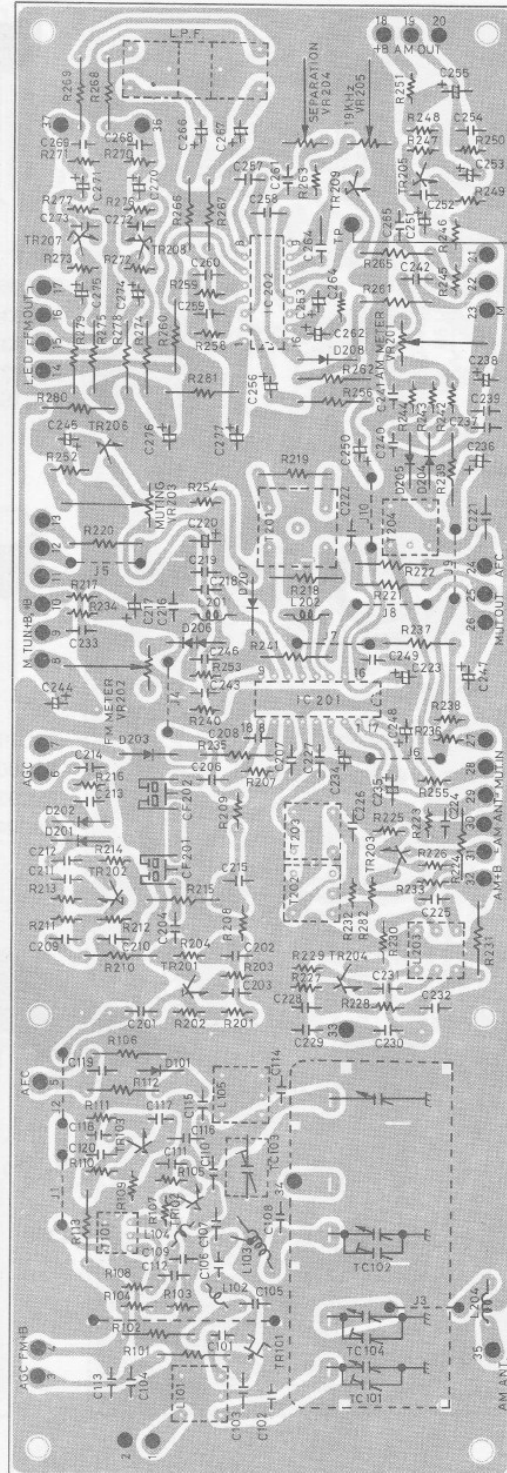
10. AM/FM TUNER, IF & MPX P.C.B.

(TOP & BOTTOM VIEWS)

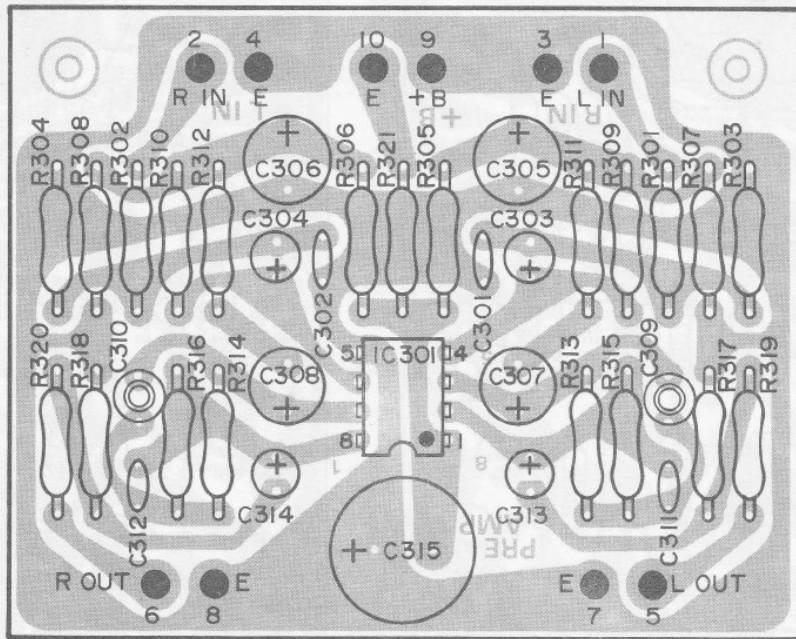
TOP VIEW



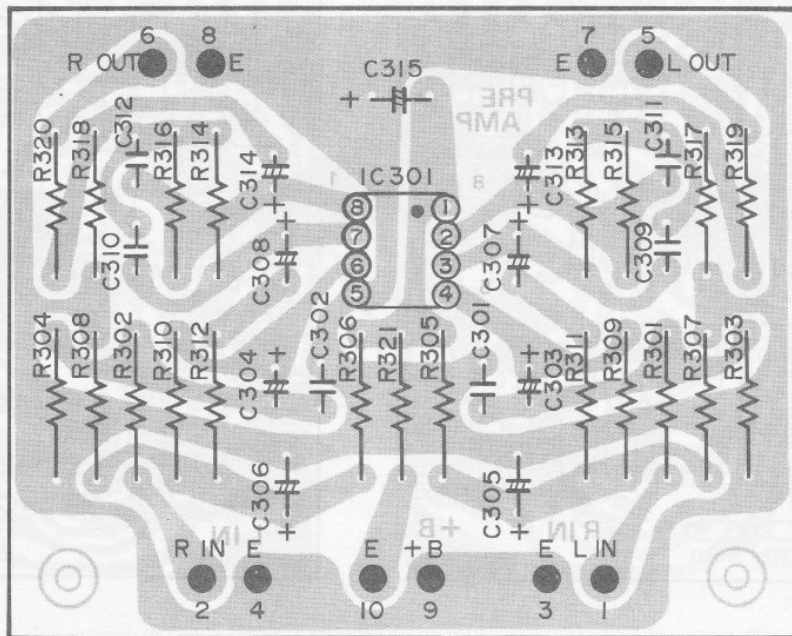
BOTTOM VIEW



11. PHONO EQUALIZER AMP P.C.B. (TOP & BOTTOM VIEWS)

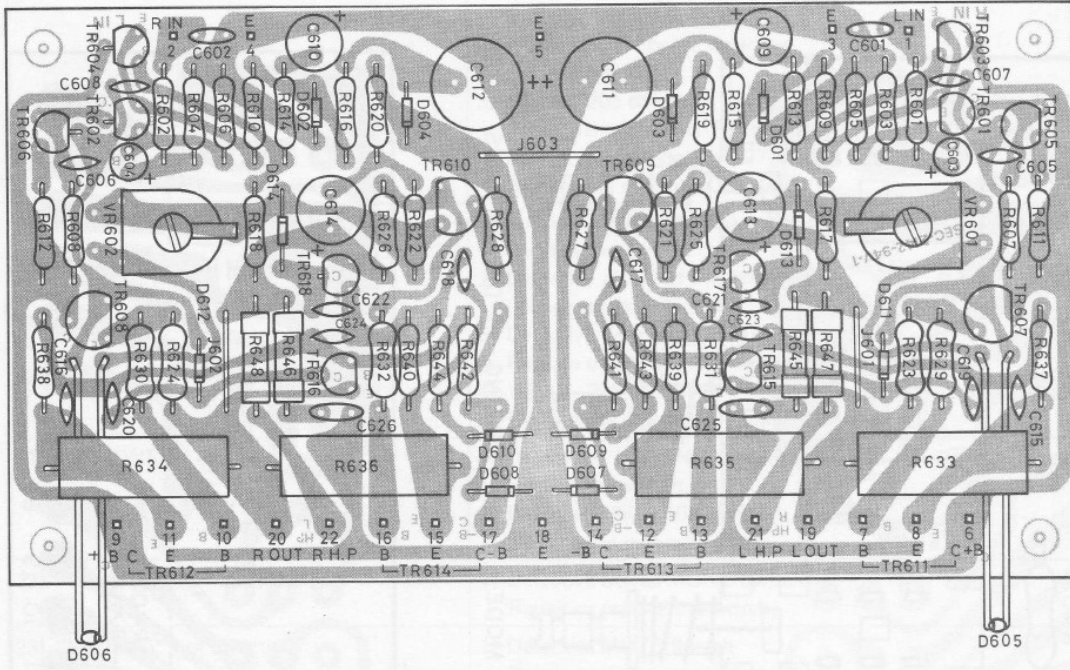


BOTTOM VIEW

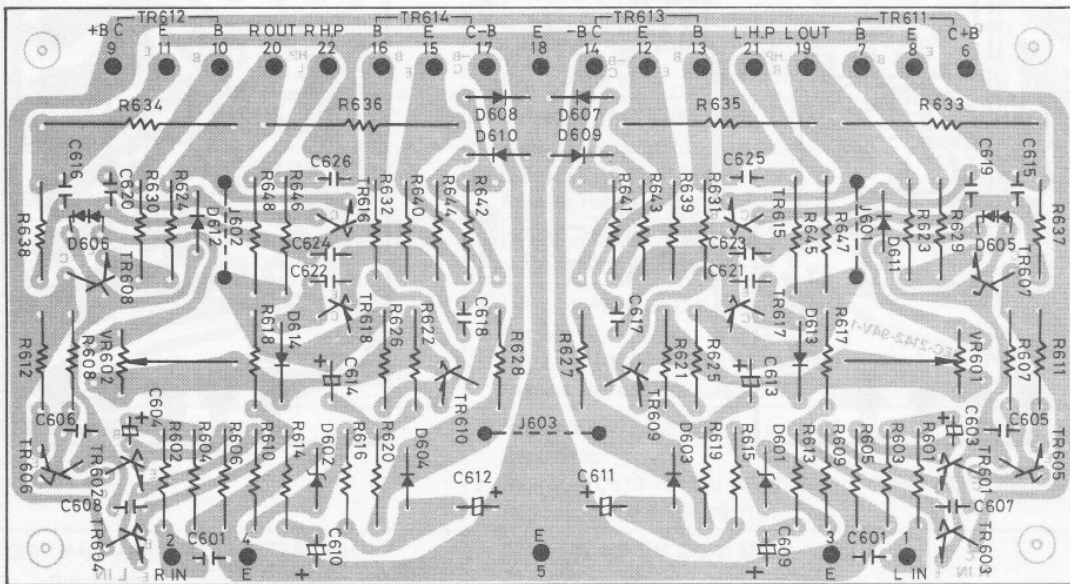


13. MAIN AMP P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

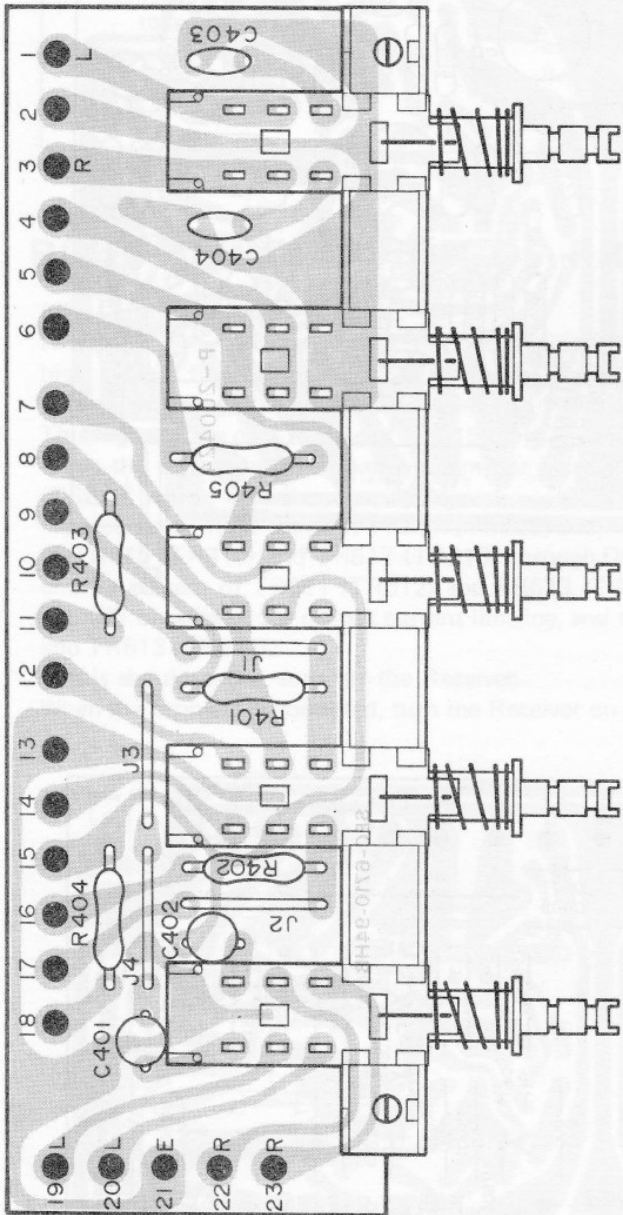


BOTTOM VIEW

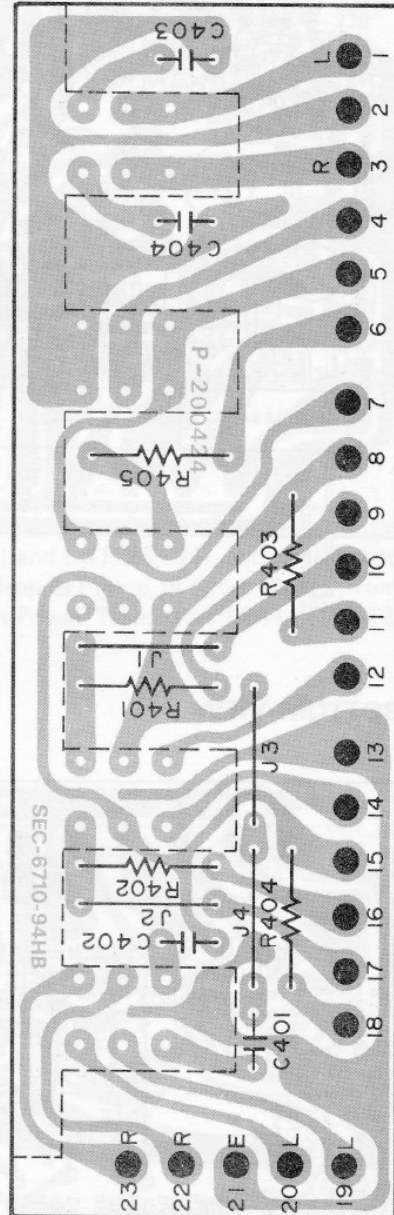


14. SWITCH P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

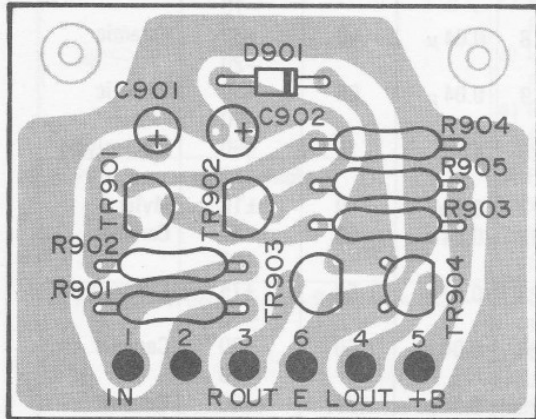


BOTTOM VIEW

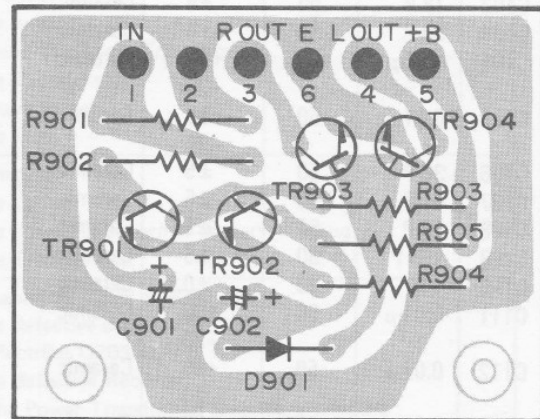


15. NOISE MUTING P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

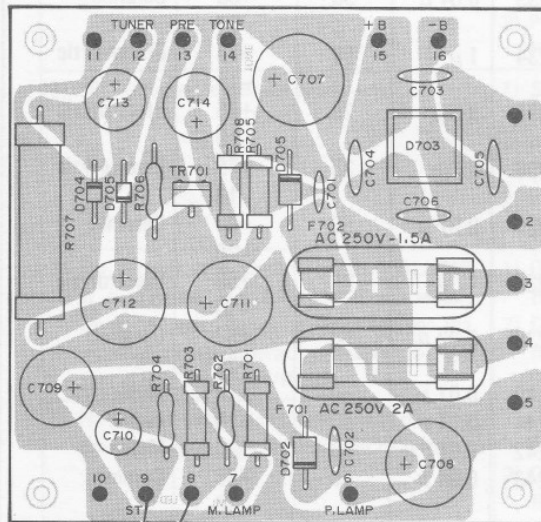


BOTTOM VIEW

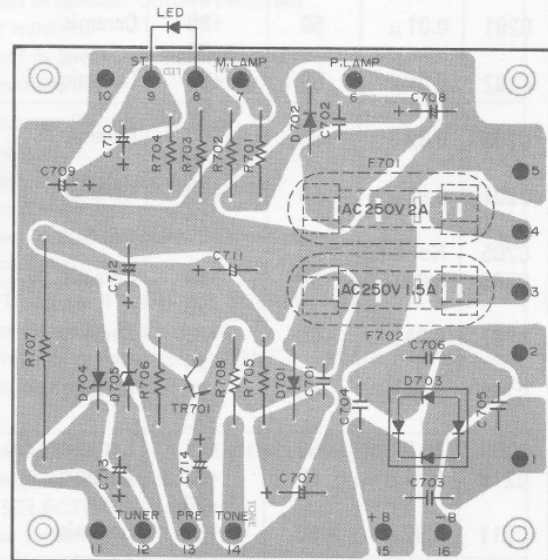


16. POWER SUPPLY P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW



BOTTOM VIEW



17. ELECTRICAL PARTS LIST

CAPACITORS					Ref. No.	Value (F)	Voltage (V)	Tolerance (%)	Material
Ref. No.	Value (F)	Voltage (V)	Tolerance (%)	Material					
C101	1 P	50	±0.5	Ceramic	C216	0.04 μ	50	+80 -20	Ceramic
C102	18 P	50	±5	Ceramic	C217	220 μ	16	+50 -10	Electrolytic
C103	30 P	50	±5	Ceramic	C218	0.04 μ	50	+80 -20	Ceramic
C104	0.01 μ	50	+80 -20	Ceramic	C219	0.04 μ	50	+80 -20	Ceramic
C105	0.01 μ	50	+80 -20	Ceramic	C220	47 μ	16	+50 -10	Electrolytic
C106	30 P	50	±5	Ceramic	C221	0.1 μ	50	±10	Mylar
C107	10 P	50	±5	Ceramic	C222	0.04 μ	50	+80 -20	Ceramic
C108	18 P	50	±5	Ceramic	C223	0.47 μ	50	+75 -10	Electrolytic
C109	150 P	50	±5	Ceramic	C224	0.04 μ	50	+80 -20	Ceramic
C110	1 P	50	±0.5	Ceramic	C225	0.04 μ	50	+80 -20	Ceramic
C111	0.01 μ	50	+80 -20	Ceramic	C226	0.04 μ	50	+80 -20	Ceramic
C112	0.01 μ	50	+80 -20	Ceramic	C227	0.01 μ	50	±10	Mylar
C113	0.01 μ	50	+80 -20	Ceramic	C228	0.04 μ	50	+80 -20	Ceramic
C114	18 P	50	±5	Ceramic	C229	10 P	50	±5	Ceramic
C115	2 P	50	±0.5	Ceramic	C230	340 P	50	±5	Polystyrene
C116	7 P	50	±0.5	Ceramic	C231	0.022 μ	50	±10	Mylar
C117	15 P	50	±5	Ceramic	C232	0.04 μ	50	+80 -20	Ceramic
C118	15 P	50	±5	Ceramic	C233	0.04 μ	50	+80 -20	Ceramic
C119	0.02 μ	50	+80 -20	Ceramic	C234	1 μ	50	+75 -10	Electrolytic
C120	0.0047 μ	50	+80 -20	Ceramic	C235	3.3 μ	25	+75 -10	Electrolytic
C201	0.01 μ	50	+80 -20	Ceramic	C236	3.3 μ	25	+75 -10	Electrolytic
C202	0.04 μ	50	+80 -20	Ceramic	C237	0.02 μ	50	+80 -20	Ceramic
C203	0.02 μ	50	+80 -20	Ceramic	C238	47 μ	16	+50 -10	Electrolytic
C204	0.01 μ	50	+80 -20	Ceramic	C239	0.02 μ	50	+80 -20	Ceramic
C205	Not used				C240	0.01 μ	50	±10	Mylar
C206	0.01 μ	50	+80 -20	Ceramic	C241	0.01 μ	50	±10	Mylar
C207	0.04 μ	50	+80 -20	Ceramic	C242	0.047 μ	50	±10	Mylar
C208	0.04 μ	50	+80 -20	Ceramic	C243	0.04 μ	50	+80 -20	Ceramic
C209	10 P	50	±5	Ceramic	C244	100 μ	10	+50 -10	Electrolytic
C210	0.04 μ	50	+80 -20	Ceramic	C245	1 μ	50	+75 -10	Electrolytic
C211	0.02 μ	50	+80 -20	Ceramic	C246	0.04 μ	50	+80 -20	Ceramic
C212	100 P	50	±5	Ceramic					
C213	0.02 μ	50	+80 -20	Ceramic					
C214	0.02 μ	50	+80 -20	Ceramic					
C215	0.04 μ	50	+80 -20	Ceramic					

Ref. No.	Value (F)	Voltage (V)	Tolerance (%)	Material	Ref. No.	Value (F)	Voltage (V)	Tolerance (%)	Material
C247	1 μ	50	+75 -10	Electrolytic	C306	47 μ	25	+50 -10	Electrolytic
C248	2.2 μ	25	+75 -10	Electrolytic	C307	10 μ	25	+50 -10	Electrolytic
C249	330 P	50	\pm 5	Ceramic	C308	10 μ	25	+50 -10	Electrolytic
C250	10 μ	16	+50 -10	Electrolytic	C309	2000 P	50	\pm 5	Polystyrene
C251	0.47 μ	50	+75 -10	Electrolytic	C310	2000 P	50	\pm 5	Polystyrene
C252	220 P	50	\pm 5	Ceramic	C311	0.0068 μ	50	\pm 10	Mylar
C253	0.47 μ	50	+75 -10	Electrolytic	C312	0.0068 μ	50	\pm 10	Mylar
C254	0.01 μ	50	\pm 10	Mylar	C313	1 μ	25	\pm 20	Tantalum
C255	220 μ	16	+50 -10	Electrolytic	C314	1 μ	25	\pm 20	Tantalum
C256	10 μ	16	+50 -10	Electrolytic	C315	330 μ	35	+50 -10	Electrolytic
C257	680 P	50	\pm 5	Polystyrene	C401	330 P	50	\pm 5	Polystyrene
C258	0.047 μ	50	\pm 10	Mylar	C402	330 P	50	\pm 5	Polystyrene
C259	0.0018 μ	50	\pm 10	Mylar	C403	0.01 μ	50	\pm 10	Mylar
C260	0.0018 μ	50	\pm 10	Mylar	C404	0.01 μ	50	\pm 10	Mylar
C261	1500 P	50	\pm 5	Polystyrene	C501	0.068 μ	50	\pm 10	Mylar
C262	0.47 μ	25	\pm 20	Aluminum	C502	0.068 μ	50	\pm 10	Mylar
C263	0.22 μ	25	\pm 20	Aluminum	C503	1 μ	35	\pm 20	Tantalum
C264	0.1 μ	50	\pm 10	Mylar	C504	1 μ	35	\pm 20	Tantalum
C265	0.02 μ	50	+80 -20	Ceramic	C505	220 P	50	\pm 5	Ceramic
C266	0.47 μ	50	+75 -10	Electrolytic	C506	220 P	50	\pm 5	Ceramic
C267	0.47 μ	50	+75 -10	Electrolytic	C507	47 μ	25	+50 -10	Electrolytic
C268	0.0018 μ	50	\pm 10	Mylar	C508	47 μ	25	+50 -10	Electrolytic
C269	0.0018 μ	50	\pm 10	Mylar	C509	10 μ	16	+50 -10	Electrolytic
C270	0.47 μ	50	+75 -10	Electrolytic	C510	10 μ	16	+50 -10	Electrolytic
C271	0.47 μ	50	+75 -10	Electrolytic	C511	3.3 μ	50	+75 -10	Electrolytic
C272	220 P	50	\pm 5	Ceramic	C512	3.3 μ	50	+75 -10	Electrolytic
C273	220 P	50	\pm 5	Ceramic	C513	100 P	50	\pm 5	Ceramic
C274	0.47 μ	50	+75 -10	Electrolytic	C514	100 P	50	\pm 5	Ceramic
C275	0.47 μ	50	+75 -10	Electrolytic	C515	0.0012 μ	50	\pm 10	Mylar
C276	470 μ	16	+50 -10	Electrolytic	C516	0.0012 μ	50	\pm 10	Mylar
C277	220 μ	16	+50 -10	Electrolytic	C517	0.033 μ	50	\pm 10	Mylar
C301	470 P	50	\pm 5	Ceramic	C518	0.033 μ	50	\pm 10	Mylar
C302	470 P	50	\pm 5	Ceramic	C519	0.033 μ	50	\pm 10	Mylar
C303	0.22 μ	25	\pm 20	Tantalum	C520	0.033 μ	50	\pm 10	Mylar
C304	0.22 μ	25	\pm 20	Tantalum	C521	1 μ	50	+75 -10	Electrolytic
C305	47 μ	25	+50 -10	Electrolytic	C522	1 μ	50	+75 -10	Electrolytic
					C523	25 P	50	\pm 5	Ceramic
					C524	25 P	50	\pm 5	Ceramic
					C525	1 μ	50	+75 -10	Electrolytic

Ref. No.	Value (F)	Voltage (V)	Tolerance (%)	Material
C526	1 μ	50	+75 -10	Electrolytic
C527	220 μ	35	+50 -10	Electrolytic
C528	0.02 μ	50	+80 -20	Ceramic
C529	220 μ	35	+50 -10	Electrolytic
C601	0.0022 μ	50	\pm 10	Mylar
C602	0.0022 μ	50	\pm 10	Mylar
C603	2.2 μ	50	+75 -10	Electrolytic
C604	2.2 μ	50	+75 -10	Electrolytic
C605	56 P	50	\pm 5	Ceramic
C606	56 P	50	\pm 5	Ceramic
C607	5 P	50	\pm 5	Ceramic
C608	5 P	50	\pm 5	Ceramic
C609	47 μ	10	+50 -10	Electrolytic
C610	47 μ	10	+50 -10	Electrolytic
C611	220 μ	35	+50 -10	Electrolytic
C612	220 μ	35	+50 -10	Electrolytic
C613	100 μ	35	+50 -10	Electrolytic
C614	100 μ	35	+50 -10	Electrolytic
C615	0.022 μ	50	+80 -20	Ceramic
C616	0.022 μ	50	+80 -20	Ceramic
C617	0.022 μ	50	+80 -20	Ceramic
C618	0.022 μ	50	+80 -20	Ceramic
C619	0.0047 μ	50	\pm 10	Ceramic
C620	0.0047 μ	50	\pm 10	Ceramic
C621	0.0047 μ	50	\pm 10	Ceramic
C622	0.0047 μ	50	\pm 10	Ceramic
C623	0.047 μ	50	+80 -20	Ceramic
C624	0.047 μ	50	+80 -20	Ceramic
C625	0.022 μ	50	\pm 10	Mylar
C626	0.022 μ	50	\pm 10	Mylar
C701	0.04 μ	50	+80 -20	Ceramic
C702	0.04 μ	50	+80 -20	Ceramic
C703	0.04 μ	100	+80 -20	Ceramic

Ref. No.	Value (F)	Voltage (V)	Tolerance (%)	Material
C704	0.04 μ	100	+80 -20	Ceramic
C705	0.04 μ	100	+80 -20	Ceramic
C706	0.04 μ	100	+80 -20	Ceramic
C707	1000 μ	50	+50 -10	Electrolytic
C708	1000 μ	16	+50 -10	Electrolytic
C709	470 μ	16	+50 -10	Electrolytic
C710	220 μ	16	+50 -10	Electrolytic
C711	470 μ	50	+50 -10	Electrolytic
C712	470 μ	35	+50 -10	Electrolytic
C713	220 μ	16	+50 -10	Electrolytic
C714	220 μ	35	+50 -10	Electrolytic
C801	0.01 μ	50	+80 -20	Ceramic
C802	6800 μ	35	+50 -10	Electrolytic
C803	6800 μ	35	+50 -10	Electrolytic
C804	0.01 μ	125	+80 -20	Ceramic (UL)
	(UK or MR Type)			
	0.01 μ	125	+80 -20	Ceramic (C.S.A.)
	(MS Type)			
C805	0.01 μ	50	+80 -20	Ceramic
C901	1 μ	50	+75 -10	Electrolytic
C902	22 μ	10	+50 -10	Electrolytic

CERAMIC FILTERS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
CF201	FM Ceramic Filter (SEF-10.7MA-8)	CA-7536	P-140030
CF202	FM Ceramic Filter (SEF-10.7MA-8)	CA-7536	P-140030

COILS & TRANSFORMERS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
L101	FM ANT Coil	CA-3594	P-110050
L102	FM IF Trap Coil	CB-2171	P-360003

Ref. No.	Description	R/S Part No.	Mfr's Part No.
L103	FM RF Coil	CA-3371	P-340033
L104	FM IF Trap Coil	CB-2171	P-360003
L105	FM OSC Coil	CA-4720	P-120043
L201	Inductor (2.2 μ H)	C-0708	P-360021
L202	Inductor (18 μ H)	C-0853	P-360029
L203	AM OSC Coil	CA-4721	P-120058
L204	Inductor (2.2 μ H)	C-0708	P-360021
L801	Balun Coil	CA-2942	P-110012
L802	AM Antenna Coil	CA-3853	P-110080
T101	FM IFT (7F-007)	CA-7428	P-130010
T201	FM IFT (3F-035)	CA-7820	P-140035
T202	AM IFT (0A-011)	CA-7281	P-130011
T203	AM IFT (0A-010)	CA-7428	P-130010
T204	AM IFT (0A-052)	CA-7821	P-130052
T801	Power Transformer (UL)	TA-0651	P-100463
T801	Power Transformer (C.S.A.)		P-100505

DIODES

Ref. No.	Description	R/S Part No.	Manufacturer
D101	Varicap ITT-410	DX-0307	ITT
D201	1N-60P or 1S-188	DX-0162 DX-0551	UNIZON SANYO, HITACHI
D202	1N-60P or 1S-188	DX-0162 DX-0551	UNIZON SANYO, HITACHI
D203	ITT-73N	DX-1008	ITT
D204	1N-60P or 1S-188	DX-0162 DX-0551	UNIZON SANYO, HITACHI
D205	1N-60P or 1S-188	DX-0162 DX-0551	UNIZON SANYO, HITACHI
D206	MV-13	DX-0352	OIZUMI
D207	1N-60P or 1S-188	DX-0162 DX-0551	UNIZON SANYO, HITACHI
D208	ITT-73N	DX-1008	ITT
D601	Zener WZ-130	DX-0537	JRC
D602	Zener WZ-130	DX-0537	JRC
D603	KB162C5	DX-0312	UNIZON
D604	KB162C5	DX-0312	UNIZON
D605	MV-13	DX-0352	OIZUMI
D606	MV-13	DX-0352	OIZUMI
D607	ITT-73N	DX-1008	ITT
D608	ITT-73N	DX-1008	ITT
D609	ITT-73N	DX-1008	ITT
D610	ITT-73N	DX-1008	ITT
D611	ITT-73N	DX-1008	ITT
D612	ITT-73N	DX-1008	ITT
D613	ITT-73N	DX-1008	ITT
D614	ITT-73N	DX-1008	ITT

Ref. No.	Description	R/S Part No.	Manufacturer
D701	SR-1K-2 or 10E-1	DX-0475	UNIZON
D702	SR-1K-2 or 10E-1	DX-0475	UNIZON
D703	S-4VB	DX-1009	FUZI
D704	Zener WZ-130	DX-0537	JRC
D705	Zener WZ-320	DX-1010	JRC
D901	ITT-73N	DX-1008	ITT

FILTER

Ref. No.	Description	R/S Part No.	Mfr's Part No.
LPF	Low Pass Filter	CA-3373	P-510006

INTEGRATED CIRCUITS

Ref. No.	Description	R/S Part No.	Manufacturer
IC201	HA-11211	MX-3448	HITACHI
IC202	LA-3350(S)	MX-3215	SANYO
IC301	NJM4558DD	MX-3447	JRC
IC501	NJM4558DF	MX-3438	JRC

LAMPS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
PL801	Dial Lamp 12 V, 0.15 A	L-0529	P-240038
PL802	Dial Lamp 12 V, 0.15 A	L-0529	P-240038
PL803	Dial Lamp 12 V, 0.15 A	L-0529	P-240038
PL804	Dial Lamp 12 V, 0.15 A	L-0529	P-240038
PL805	Meter Lamp 12 V, 0.15 A	L-0529	P-240038

LIGHT EMITTING DIODE

Ref. No.	Description	R/S Part No.	Manufacturer
LED	GL3AR1	L-0835	SHARP

METER

Ref. No.	Description	R/S Part No.	Mfr's Part No.
M801	AM/FM Signal Meter (200 μ A, 1.2 K ohm)	M-0365	P-230065

RESISTORS						Ref. No.	Value (ohm)	Wattage (W)	Tolerance (%)	Material	R/S Part No.
R101	100 K	1/4	± 5	Carbon	NEE-0371	R240	33 K	1/4	± 5	Carbon	NEE-0324
R102	330	1/4	± 5	Carbon	NEE-0159	R241	2.2 K	1/4	± 5	Carbon	NEE-0216
R103	5.6 K	1/4	± 5	Carbon	NEE-0257	R242	1.5 K	1/4	± 5	Carbon	NEE-0206
R104	33 K	1/4	± 5	Carbon	NEE-0324	R243	1 K	1/4	± 5	Carbon	NEE-0196
R105	1.5 K	1/4	± 5	Carbon	NEE-0206	R244	5.6 K	1/4	± 5	Carbon	NEE-0257
R106	220 K	1/4	± 5	Carbon	NEE-0396	R245	10 K	1/4	± 5	Carbon	NEE-0281
R107	330	1/4	± 5	Carbon	NEE-0159	R246	39 K	1/4	± 5	Carbon	NEE-0330
R108	330	1/4	± 5	Carbon	NEE-0159	R247	1.5 M	1/4	± 5	Carbon	NEE-0450
R109	10 K	1/4	± 5	Carbon	NEE-0281	R248	4.7 K	1/4	± 5	Carbon	NEE-0247
R110	22 K	1/4	± 5	Carbon	NEE-0311	R249	1 K	1/4	± 5	Carbon	NEE-0196
R111	3.3 K	1/4	± 5	Carbon	NEE-0230	R250	39 K	1/4	± 5	Carbon	NEE-0330
R112	100 K	1/4	± 5	Carbon	NEE-0391	R251	220	1/4	± 5	Carbon	NEE-0149
R113	330	1/4	± 5	Carbon	NEE-0159	R252	10 K	1/4	± 5	Carbon	NEE-0281
R201	3.3 K	1/4	± 5	Carbon	NEE-0230	R253	47 K	1/4	± 5	Carbon	NEE-0340
R202	560	1/4	± 5	Carbon	NEE-0176	R254	10 K	1/4	± 5	Carbon	NEE-0281
R203	330	1/4	± 5	Carbon	NEE-0159	R255	12 K	1/4	± 5	Carbon	NEE-0288
R204	330	1/4	± 5	Carbon	NEE-0159	R256	33 K	1/4	± 5	Carbon	NEE-0324
R205	Not used					R257	Not used				
R206	Not used					R258	3.3 K	1/4	± 5	Carbon	NEE-0230
R207	330	1/4	± 5	Carbon	NEE-0159	R259	3.3 K	1/4	± 5	Carbon	NEE-0230
R208	100	1/4	± 5	Carbon	NEE-0132	R260	1.2 K	1/2	± 5	Carbon	NEF-0199
R209	47	1/4	± 5	Carbon	NEE-0099	R261	1.8 K	1/4	± 5	Carbon	NEE-0210
R210	10	1/4	± 5	Carbon	NEE-0063	R262	4.7 K	1/4	± 5	Carbon	NEE-0247
R211	3.3 K	1/4	± 5	Carbon	NEE-0230	R263	8.2 K	1/4	± 5	Carbon	NEE-0271
R212	10 K	1/4	± 5	Carbon	NEE-0281	R264	1 K	1/4	± 5	Carbon	NEE-0196
R213	1K	1/4	± 5	Carbon	NEE-0196	R265	47 K	1/4	± 5	Carbon	NEE-0340
R214	560	1/4	± 5	Carbon	NEE-0176	R266	3.3 K	1/4	± 5	Carbon	NEE-0230
R215	100	1/4	± 5	Carbon	NEE-0132	R267	3.3 K	1/4	± 5	Carbon	NEE-0230
R216	10 K	1/4	± 5	Carbon	NEE-0281	R268	3.3 K	1/4	± 5	Carbon	NEE-0230
R217	22	1/4	± 5	Carbon	NEE-0078	R269	3.3 K	1/4	± 5	Carbon	NEE-0230
R218	4.7 K	1/4	± 5	Carbon	NEE-0247	R270	100 K	1/4	± 5	Carbon	NEE-0371
R219	2.2 K	1/4	± 5	Carbon	NEE-0216	R271	100 K	1/4	± 5	Carbon	NEE-0371
R220	220	1/4	± 5	Carbon	NEE-0149	R272	1.5 M	1/4	± 5	Carbon	NEE-0450
R221	8.2 K	1/4	± 5	Carbon	NEE-0271	R273	1.5 M	1/4	± 5	Carbon	NEE-0450
R222	470 K	1/4	± 5	Carbon	NEE-0423	R274	4.7 K	1/4	± 5	Carbon	NEE-0247
R223	1 K	1/4	± 5	Carbon	NEE-0196	R275	4.7 K	1/4	± 5	Carbon	NEE-0247
R224	10 K	1/4	± 5	Carbon	NEE-0281	R276	820	1/4	± 5	Carbon	NEE-0187
R225	1.8 K	1/4	± 5	Carbon	NEE-0210	R277	820	1/4	± 5	Carbon	NEE-0187
R226	100	1/4	± 5	Carbon	NEE-0132	R278	39 K	1/4	± 5	Carbon	NEE-0330
R227	10 K	1/4	± 5	Carbon	NEE-0281	R279	39 K	1/4	± 5	Carbon	NEE-0330
R228	15 K	1/4	± 5	Carbon	NEE-0297	R280	100	1/4	± 5	Carbon	NEE-0132
R229	2.2 K	1/4	± 5	Carbon	NEE-0216	R281	47	1/4	± 5	Carbon	NEE-0099
R230	1.5 K	1/4	± 5	Carbon	NEE-0206	R282	100	1/4	± 5	Carbon	NEE-0099
R231	4.7 K	1/4	± 5	Carbon	NEE-0247	R301	1.5 K	1/4	± 5	Carbon	NEE-0206
R232	27 K	1/4	± 5	Carbon	NEE-0316	R302	1.5 K	1/4	± 5	Carbon	NEE-0206
R233	4.7 K	1/4	± 5	Carbon	NEE-0247	R303	100 K	1/4	± 5	Carbon	NEE-0371
R234	47	1/4	± 5	Carbon	NEE-0099	R304	100 K	1/4	± 5	Carbon	NEE-0371
R235	150 K	1/4	± 5	Carbon	NEE-0384	R305	10 K	1/4	± 5	Carbon	NEE-0281
R236	68 K	1/4	± 5	Carbon	NEE-0354	R306	10 K	1/4	± 5	Carbon	NEE-0281
R237	47 K	1/4	± 5	Carbon	NEE-0340	R307	10 K	1/4	± 5	Carbon	NEE-0281
R238	39 K	1/4	± 5	Carbon	NEE-0330	R308	10 K	1/4	± 5	Carbon	NEE-0281
R239	33 K	1/4	± 5	Carbon	NEE-0324	R309	100 K	1/4	± 5	Carbon	NEE-0371
						R310	100 K	1/4	± 5	Carbon	NEE-0371

Ref. No.	Value (ohm)	Wattage (W)	Tolerance (%)	Material	R/S Part No.	Ref. No.	Value (ohm)	Wattage (W)	Tolerance (%)	Material	R/S Part No.
R311	560	1/4	± 5	Carbon	NEE-0176	R601	1 K	1/4	± 5	Carbon	NEE-0196
R312	560	1/4	± 5	Carbon	NEE-0176	R602	1 K	1/4	± 5	Carbon	NEE-0196
R313	33 K	1/4	± 5	Carbon	NEE-0324	R603	220 K	1/4	± 5	Carbon	NEE-0396
R314	33 K	1/4	± 5	Carbon	NEE-0324	R604	220 K	1/4	± 5	Carbon	NEE-0396
R315	330 K	1/4	± 5	Carbon	NEE-0410	R605	33 K	1/4	± 5	Carbon	NEE-0324
R316	330 K	1/4	± 5	Carbon	NEE-0410	R606	33 K	1/4	± 5	Carbon	NEE-0324
R317	10 K	1/4	± 5	Carbon	NEE-0281	R607	2.7 K	1/4	± 5	Carbon	NEE-0224
R318	10 K	1/4	± 5	Carbon	NEE-0281	R608	2.7 K	1/4	± 5	Carbon	NEE-0224
R319	4.7 K	1/4	± 5	Carbon	NEE-0247	R609	15 K	1/4	± 5	Carbon	NEE-0297
R320	4.7 K	1/4	± 5	Carbon	NEE-0247	R610	15 K	1/4	± 5	Carbon	NEE-0297
R321	680	1/4	± 5	Carbon	NEE-0183	R611	56	1/4	± 5	Carbon	NEE-0107
R401	4.7 K	1/4	± 5	Carbon	NEE-0247	R612	56	1/4	± 5	Carbon	NEE-0107
R402	4.7 K	1/4	± 5	Carbon	NEE-0247	R613	2.2 K	1/4	± 5	Carbon	NEE-0216
R403	4.7 K	1/4	± 5	Carbon	NEE-0247	R614	2.2 K	1/4	± 5	Carbon	NEE-0216
R404	4.7 K	1/4	± 5	Carbon	NEE-0247	R615	5.6 K	1/4	± 5	Carbon	NEE-0257
R405	10 K	1/4	± 5	Carbon	NEE-0281	R616	5.6 K	1/4	± 5	Carbon	NEE-0257
R501	6.8 K	1/4	± 5	Carbon	NEE-0262	R617	33 K	1/4	± 5	Carbon	NEE-0324
R502	6.8 K	1/4	± 5	Carbon	NEE-0262	R618	33 K	1/4	± 5	Carbon	NEE-0324
R503	1 K	1/4	± 5	Carbon	NEE-0196	R619	1.8 K	1/4	± 5	Carbon	NEE-0210
R504	1 K	1/4	± 5	Carbon	NEE-0196	R620	1.8 K	1/4	± 5	Carbon	NEE-0210
R505	10 K	1/4	± 5	Carbon	NEE-0281	R621	2.7 K	1/4	± 5	Carbon	NEE-0224
R506	10 K	1/4	± 5	Carbon	NEE-0281	R622	2.7 K	1/4	± 5	Carbon	NEE-0224
R507	10 K	1/4	± 5	Carbon	NEE-0281	R623	100	1/2	± 5	Carbon	NEF-0132
R508	10 K	1/4	± 5	Carbon	NEE-0281					(UL)	
R509	220 K	1/4	± 5	Carbon	NEE-0396	R623	100	1	± 5	Metal	
R510	220 K	1/4	± 5	Carbon	NEE-0396					Oxide	
R511	2.7 K	1/4	± 5	Carbon	NEE-0224					(C.S.A.)	
R512	2.7 K	1/4	± 5	Carbon	NEE-0224	R624	100	1/2	± 5	Carbon	NEF-0132
R513	18 K	1/4	± 5	Carbon	NEE-0303					(UL)	
R514	18 K	1/4	± 5	Carbon	NEE-0303	R624	100	1	± 5	Metal	
R515	1.5 K	1/4	± 5	Carbon	NEE-0206					Oxide	
R516	1.5 K	1/4	± 5	Carbon	NEE-0206					(C.S.A.)	
R517	4.7 K	1/4	± 5	Carbon	NEE-0247	R625	100	1/2	± 5	Carbon	NEF-0132
R518	4.7 K	1/4	± 5	Carbon	NEE-0247					(UL)	
R519	4.7 K	1/4	± 5	Carbon	NEE-0247	R625	100	1	± 5	Metal	
R520	4.7 K	1/4	± 5	Carbon	NEE-0247					Oxide	
R521	1 K	1/4	± 5	Carbon	NEE-0196					(C.S.A.)	
R522	1 K	1/4	± 5	Carbon	NEE-0196	R626	100	1/2	± 5	Carbon	NEF-0132
R523	15 K	1/4	± 5	Carbon	NEE-0297					(UL)	
R524	15 K	1/4	± 5	Carbon	NEE-0297	R626	100	1	± 5	Metal	
R525	15 K	1/4	± 5	Carbon	NEE-0297					Oxide	
R526	15 K	1/4	± 5	Carbon	NEE-0297					(C.S.A.)	
R527	15 K	1/4	± 5	Carbon	NEE-0297	R627	18	1/2	± 5	Carbon	NEF-0075
R528	15 K	1/4	± 5	Carbon	NEE-0297	R628	18	1/2	± 5	Carbon	NEF-0075
R529	1.8 M	1/4	± 5	Carbon	NEE-0521	R629	4.7	1/2	± 5	Carbon	NEF-0047
R530	1.8 M	1/4	± 5	Carbon	NEE-0521					(UL)	
R531	4.7 K	1/4	± 5	Carbon	NEE-0247	R629	4.7	1	± 5	Metal	
R532	4.7 K	1/4	± 5	Carbon	NEE-0247					Oxide	
R533	100 K	1/4	± 5	Carbon	NEE-0371					(C.S.A.)	
R534	100 K	1/4	± 5	Carbon	NEE-0371	R630	4.7	1/2	± 5	Carbon	NEF-0047
R535	1 K	1/4	± 5	Carbon	NEE-0196					(UL)	
R536	1 K	1/4	± 5	Carbon	NEE-0196	R630	4.7	1	± 5	Metal	
R537	47 K	1/4	± 5	Carbon	NEE-0340					Oxide	
R538	1 K	1/4	± 5	Carbon	NEE-0196					(C.S.A.)	

Ref. No.	Value (ohm)	Wattage (W)	Tolerance (%)	Material	R/S Part No.	JUMPER WIRES			
Ref. No.	Description	R/S Part No.	Mfr's Part No.						
R631	4.7	1/2	± 5	Carbon (UL)	NEF-0047	J101(J1)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R631	4.7	1	± 5	Metal Oxide (C.S.A.)		J102(J2)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R632	4.7	1/2	± 5	Carbon (UL)	NEF-0047	J103(J3)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R632	4.7	1	± 5	Metal Oxide (C.S.A.)		J201(J4)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R633	0.5	5	± 5	Cement	NEK-0010	J202(J5)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R634	0.5	5	± 5	Cement	NEK-0010	J203(J6)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R635	0.5	5	± 5	Cement	NEK-0010	J203(J6)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R636	0.5	5	± 5	Cement	NEK-0010	J204(J7)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R637	120	1/4	± 5	Carbon	NEE-0136	J205(J8)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R638	120	1/4	± 5	Carbon	NEE-0136	J206(J9)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R639	120	1/4	± 5	Carbon	NEE-0136	J401(J1)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R640	120	1/4	± 5	Carbon	NEE-0136	J402(J2)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R641	1 K	1/4	± 5	Carbon	NEE-0196	J403(J3)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R642	1 K	1/4	± 5	Carbon	NEE-0196	J404(J4)	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R643	1 K	1/4	± 5	Carbon	NEE-0196	J501	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R644	1 K	1/4	± 5	Carbon	NEE-0196	J502	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R645	12	1	± 5	Metal Oxide	NEG-0067	J503	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R646	12	1	± 5	Metal Oxide	NEG-0067	J504	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R647	220	1	± 5	Metal Oxide	NEG-0049	J505	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R648	220	1	± 5	Metal Oxide	NEG-0149	J601	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R701	15	1	± 5	Metal Oxide	NEG-0074	J602	Jumper wire (P = 12.5 m/m)	HB-7049	P-320128
R702	22	1/2	± 5	Carbon	NEF-0078	J603	Jumper wire (P = 15 m/m)	HB-7050	P-320195
R703	470	1	± 5	Metal Oxide	NEG-0169				
R704	10 K	1/4	± 5	Carbon	NEE-0281				
R705	22	1	± 5	Metal Oxide	NEG-0078				
R706	560	1/2	± 5	Carbon	NEF-0176				
R707	330	4	± 5	Metal Oxide					
R708	220	1	± 5	Metal Oxide	NEG-0149				
R801	10 K	1/4	± 5	Carbon	NEE-0281				
R802	10 K	1/4	± 5	Carbon	NEE-0281				
R803	100 K	1/4	± 5	Carbon	NEE-0371				
R804	100 K	1/4	± 5	Carbon	NEE-0371				
R805	2.2 M	1/2	± 5	Carbon	NEF-0454				
R901	100 K	1/4	± 5	Carbon	NEE-0371				
R902	22 K	1/4	± 5	Carbon	NEE-0311				
R903	10 K	1/4	± 5	Carbon	NEE-0281				
R904	47	1/4	± 5	Carbon	NEE-0099				
R905	10 K	1/4	± 5	Carbon	NEE-0281				
R906	100 K	1/4	± 5	Carbon	NEE-0371				

SWITCHES			
Ref. No.	Description	R/S Part No.	Mfr's Part No.
Ss1-Ss7	SELECTOR	S-1291	P-180250
Sp1-Sp4	SPEAKER	S-1292	P-180251
Ps1-Ps2	POWER	S-7047	P-180044
S1	MUTE	S-7343	P-180249
S2	MONO	S-7343	P-180249
S3	FM 25 μ S	S-7343	P-180249
S4	TAPE MON	S-7343	P-180249
S5	LOUDNESS	S-7343	P-180249
THERMAL PROTECTOR			
Ref. No.	Description	R/S Part No.	Mfr's Part No.
TP801	UI-2 (90°C, 125 V/6A)		P-290019
FUSES			
Ref. No.	Description	R/S Part No.	Mfr's Part No.
F701	2 A, 250 V Quick	HF-1115	P-250015
F702	1.5 A, 250 V Quick	HF-0004	P-250007
F801	3 A, 250 V Quick	HF-0091	P-250038
TRANSISTORS			
Ref. No.	Type No.	Manufacturer	
TR101	FET2KS41(F)	SANYO	
TR102	2SC1674(L, K)	NEC	
TR103	2SC1674(L, K)	NEC	
TR201	2SC930(E, D)	SANYO	
TR202	2SC930(E, D)	SANYO	
TR203	2SC929(E, D)	SANYO	
TR204	2SC929(E, D)	SANYO	
TR205	2SC536(H)	SANYO	
TR206	2SC536(H)	SANYO	
TR207	2SC900(E, U)	NEC	
TR208	2SC900(E, U)	NEC	
TR209	2SC536(H)	SANYO	
TR501	2SC900(E, U)	NEC	
TR502	2SC900(E, U)	NEC	
TR503	2SC945A(P)	NEC	
TR601	2SC1570(G)	SANYO	
TR602	2SC1570(G)	SANYO	
TR603	2SC1570(G)	SANYO	
TR604	2SC1570(G)	SANYO	
TR605	2SA659(D, E)	SANYO	
TR606	2SA659(D, E)	SANYO	
TR607	2SD438(D, E)	SANYO	
TR608	2SD438(D, E)	SANYO	
TR609	2SB560(D, E)	SANYO	
TR610	2SB560(D, E)	SANYO	
TR611	2SD315(D, E) V10	SANYO	

Ref. No.	Type No.	Manufacturer	
TR612	2SD315(D, E) V10	SANYO	
TR613	2SB509(D, E) V10	SANYO	
TR614	2SB509(D, E) V10	SANYO	
TR615	2SC1175(D, E) V10	SANYO	
TR616	2SC1175(D, E) V10	SANYO	
TR617	2SA659(D, E) V10	SANYO	
TR618	2SA659(D, E) V10	SANYO	
TR701	2SD571(L, K)	NEC	
TR901	2SC923(E, U)	NEC	
TR902	2SC923(E, U)	NEC	
TR903	2SC923(E, U)	NEC	
TR904	2SC923(E, U)	NEC	
VARIABLE CAPACITORS			
Ref. No.	Description	R/S Part No.	Mfr's Part No.
VC101	Tuning Gang	C-4567	P-150019
-VC105	C75CJ111 (Includes TC101, 103, 104 and 105.)		
TC103	Trimmer 1PX-10	CA-0249	P-160007
VARIABLE RESISTORS			
Ref. No.	Description	R/S Part No.	Mfr's Part No.
VR201	Trimmer 10 K ohm B	P-6466	P-170249
VR202	Trimmer 47 K ohm B	P-6467	P-170252
VR203	Trimmer 47 K ohm B	P-6467	P-170252
VR204	Trimmer 1 K ohm B	P-6469	P-170245
VR205	Trimmer 4.7 K ohm B	P-6465	P-170248
VR501	Potentiometer 100 K ohm 2B x 2 (VOLUME)	P-1837	P-170266
VR502	Potentiometer 100 K ohm W (BALANCE)	P-3077	P-170267
VR503	Potentiometer 100 K ohm 1B x 2 (TREBLE)	P-2081	P-170273
VR504	Potentiometer 100 K ohm 1B x 2 (BASS)	P-2081	P-170273
VR601	Trimmer 200 ohm B		P-170243
VR602	Trimmer 200 ohm B		P-170243

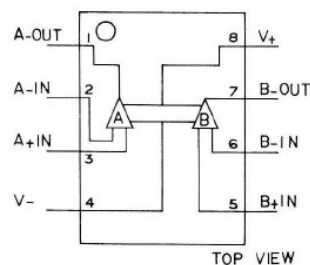
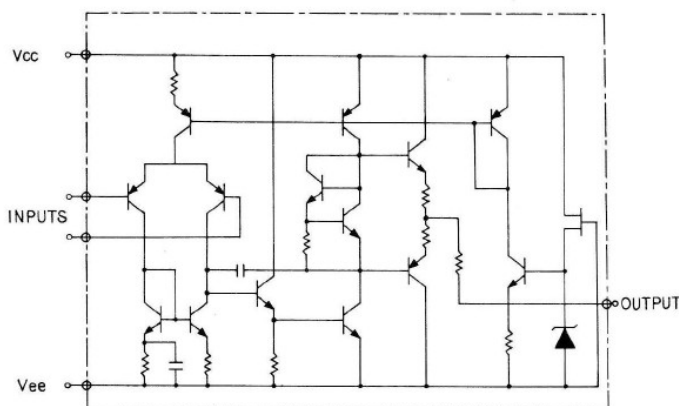
18. EXPLODED VIEW PARTS LIST

Ref. No.	Description	R/S Part No.	Mfr's Part No.	Ref. No.	Description	R/S Part No.	Mfr's Part No.
1	Front Chassis		P-400165	48	AC Outlet	J-6434	P-190098
2	Side Bracket (L)	HB-7052	P-411271	49	AC Outlet Cover	HB-6377	P-610454
3	Side Bracket (R)	HB-7053	P-411270	50	8P Speaker Terminal (Screw)	J-4455	P-320086
4	Rail for Pointer	HB-7054	P-411269	51	4P Speaker Terminal (RCA)	J-4473	P-190100
5	Lamp Cover	HB-7055	P-411268	52	Fuse Holder (UL)	F-1131	P-260011
6	Reflector Board	HB-7056	P-411272		Fuse Holder (C.S.A.)		P-260013
7	Lamp Cover for Meter	HB-7057	P-411288	53	10P Input Terminal	J-4526	P-320095
8	Fuse Type Lamp	L-0529	P-240038	54	Antenna Terminal	J-4527	P-320190
9	Lamp Holder	HB-2423	P-260012	55	5P DIN Connector	J-0747	P-190036
10	Dial Scale	G-0322	P-640171			J-0747	or P-190126
11	Side Holder (L)	HB-7058	P-411292	56	Ground Terminal	HD-2191	P-420225
12	Side Holder (R)	HB-7059	P-411291	57	FM Line Antenna Bracket	HB-7066	P-411297
13	Tuning Shaft Ass'y	D-3238	P-420269	58	Insulator for Line Antenna	HB-6963	P-690214
14	Dial Pointer Ass'y	D-1232	P-450058	59	AM Antenna Coil	CA-3853	P-110080
15	Dial Holder	HB-7060	P-411289	60	Antenna Holder	HB-2890	P-410856
16	Headphone Jack	J-0919	P-190125	61	Electrolytic Capacitor C802, 803 (6800 μ F/35 V)		P-220031
17	Headphone Jack Spacer		P-820458	62	Ground Lug Terminal	HB-6878	P-320152
18	Main Chassis		P-400164	63	Balun Coil	CA-2942	P-110012
19	Power Transformer Bracket	HB-7061	P-411273	64	Balun Coil P.C.B.	X-4972	P-200244
20	Reinforced Bracket		P-411334	65	AM/FM Signal Meter	M-0365	P-230065
21	Sub-pulley Bracket (A)	HB-7062	P-411293	66	LED (Stereo Indicator) (LED801)	L-0835	
22	Sub-pulley Bracket (B)	HB-7063	P-411287	67	Ring for LED	HB-7067	P-610504
23	Sub-pulley Bracket (D)	HB-7064	P-411313	68	LED Bracket	RB-5993	P-440118
24	Sub-pulley (L)	D-0385	P-610049	69	Bushing for LED	HB-7068	P-680161
25	Dial Pulley	D-0396	P-610439	70	Wire Stay (A)	H-3498	P-450006
26	Dial Spring	RA-5847	P-440014	71	Thermal Protector (TP801)		P-290019
27	Hook			72	Thermal Protector Bracket	HB-6780	P-411217
28	Dial Spring			73	Heat Sink for Main Amp.	HH-0248	P-411299
29	Tuner, IF & MPX Assembled P.C.B.	X7592	U-22025	74	Heat Sink for Rectifier		P-411327
30	Power Supply Assembled P.C.B.	X-7596	U-17046	75	P.C.B. Bracket	HB-7073	P-410609
31	PHONO Equalizer Amp. Assembled P.C.B.	X-7593	U-14078	76	Front Panel Ass'y	Z-3825	P-700238
32	MAIN Amp. Assembled P.C.B.	X-7595	U-16061	77	Dial Window		P-640175
33	NOISE MUTING Assembled P.C.B.		U-25077	78	Front Dial Window	G-0323	P-640172
34	SELECTOR Switch	S-1291	P-180250	79	Power Transistor TR611, 612, 613, 614 (2SD315 and 2SB509)		
35	SPEAKER Switch	S-1292	P-180251	80	Soft Tape for Meter		P-680166
36	Switch Bracket	HB-7065	P-411285	81	Dial Window Holder		P-411372
37	Switch Joint	HB-1331	P-610091	82	Cushion	HB-7070	P-680158
38	Switch Shaft	D-3239	P-420270	83	Blind Sheet	HB-7071	P-660160
39	Switch Bearing	HB-1344	P-610094	84	Push Knob (252)	K-2780	P-650252
40	Switch Assembled P.C.B.	X-7597	U-23074	85	Push Knob (253)	K-2781	P-650253
41	TONE CONTROL Assembled P.C.B.	X-7594	U-14079	86	TUNING Knob (250)	K-2782	P-650250
42	Power Switch	S-7047	P-180044	87	Control Knob (251)	K-2783	P-650251
43	Power Switch Cover	HB-6875	P-480145	88	Cabinet Ass'y	Z-3828	P-620273
44	Power Transformer (UL)	TA-0651	P-100463	89	Foot (D)	F-0223	P-610494
	Power Transformer (C.S.A.)		P-100505	90	Cabinet Spacer		P-480184
45	Back Panel (UL)	Z-3924	P-411267	91	Sub-pulley (S)		P-610049
	Back Panel (C.S.A.)		P-411280	HARDWARE			
46	AC Cord Strain Relief	HB-0598	P-480010	Ref. No.	Description	R/S Part No.	Mfr's Part No.
47	AC Cord	W-1000	P-310001	S1	Bind Tapping Screw 3 x 8 BT-2		

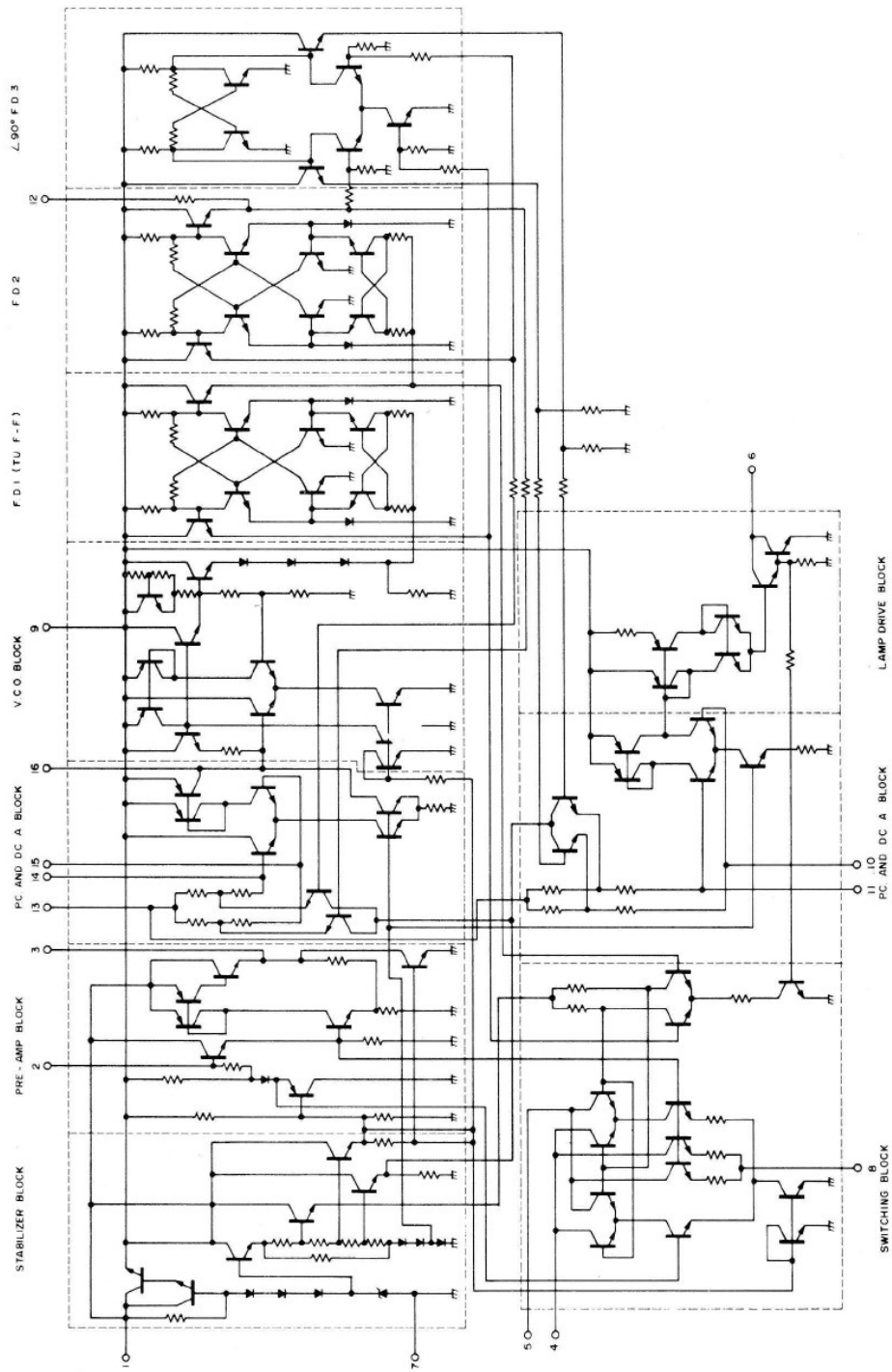
Ref. No.	Description	R/S Part No.	Mfr's Part No.	Ref. No.	Description	R/S Part No.	Mfr's Part No.
S2	Bind Tapping Screw with Waveform Washer Ass'y 3 x 8 BT-2			R2	Rivet YB-429 (Black)		
S3	Screw with Spacer 3 x 9 x 3			R3	Rivet YB-420 (Black)		
S4	Screw with Toothed Lock Washer 3 x 6 P			W1	E type Washer 4 ϕ		
S5	Tapping Screw with Toothed Lock Washer (Black) 3 x 8 BT-2			W2	Washer 4 W		
S6	Screw 4 x 37 P (Black)			W3	Toothed Lock Washer (Inside) 4 ϕ		
S7	Bind Tapping Screw 3 x 10 BT-2			W4	Washer 3 W		
S8	Screw with Toothed Lock Washer 3 x 5 P			W5	Washer for Wire Solding 3 ϕ		
S9	Special Screw (SWRM10)		P-710130	W6	Toothed Lock Washer (Outside) 3 ϕ		
S10	Wood Screw 3.1 x 13 PW			W7	Polyethylene Washer 0.5 t	HD-8185	P-480172
S11	Screw 4 x 16 P			W8	Square Washer		P-410033
				W9	Nylon Washer 0.3 t		P-480183
R1	Rivet YB-429			SW1	Spring Washer 3SW		
				SW2	Spring Washer 4SW		
				N1	Nut 4N		
				N2	Special Nut with Cover		

19. IC INTERNAL DIAGRAM

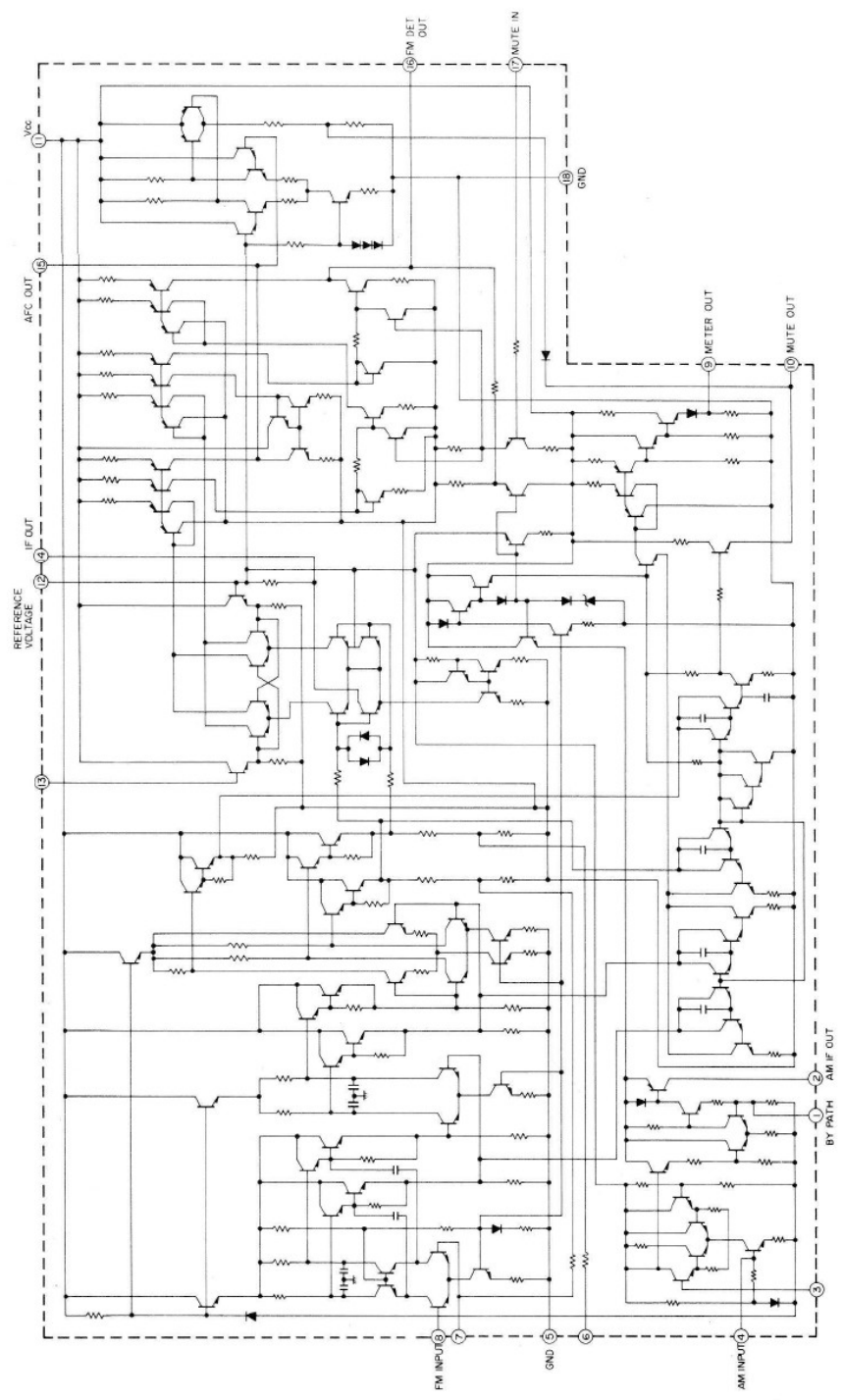
(NJM-4558)



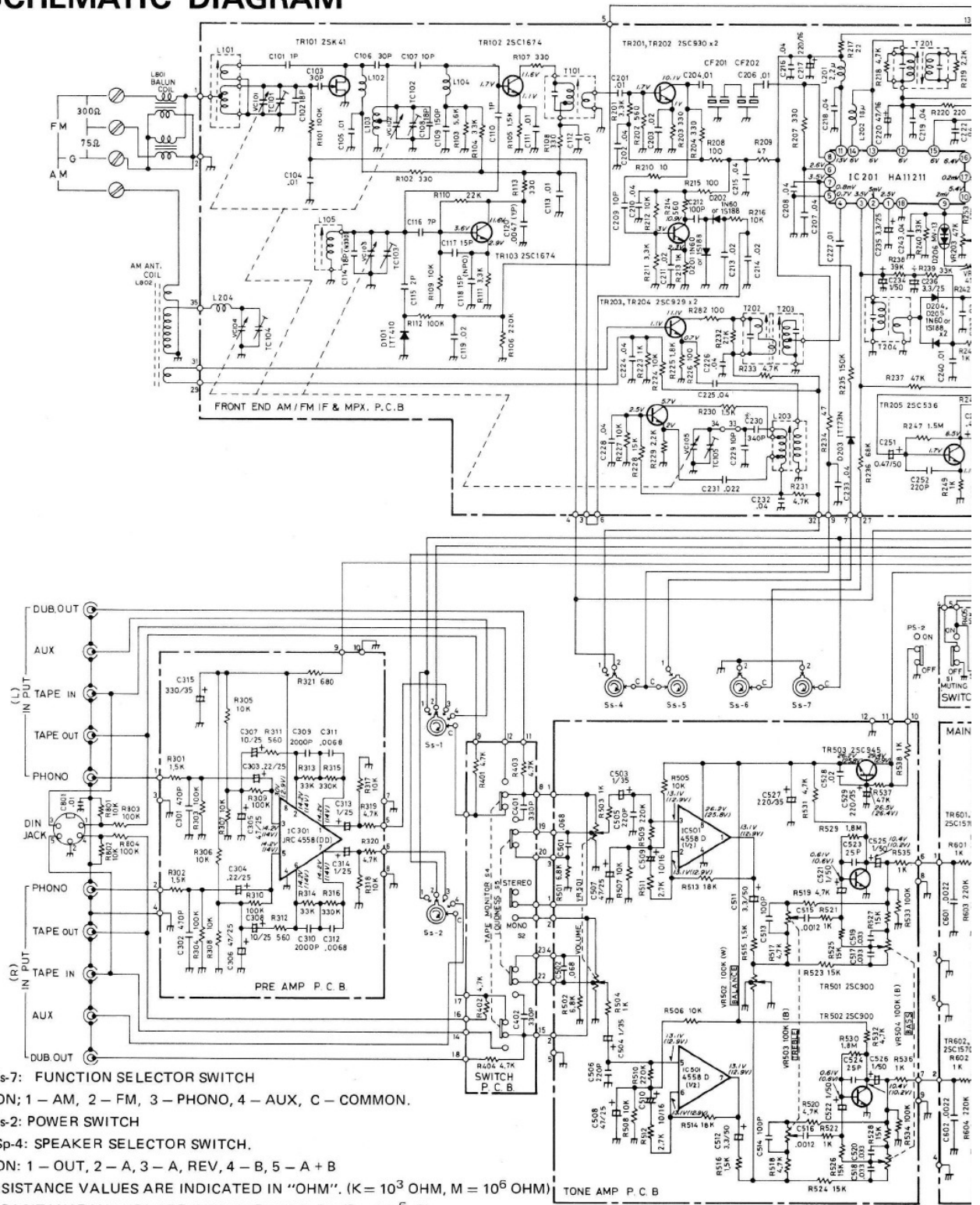
(LA-3350)



(HA-11211)

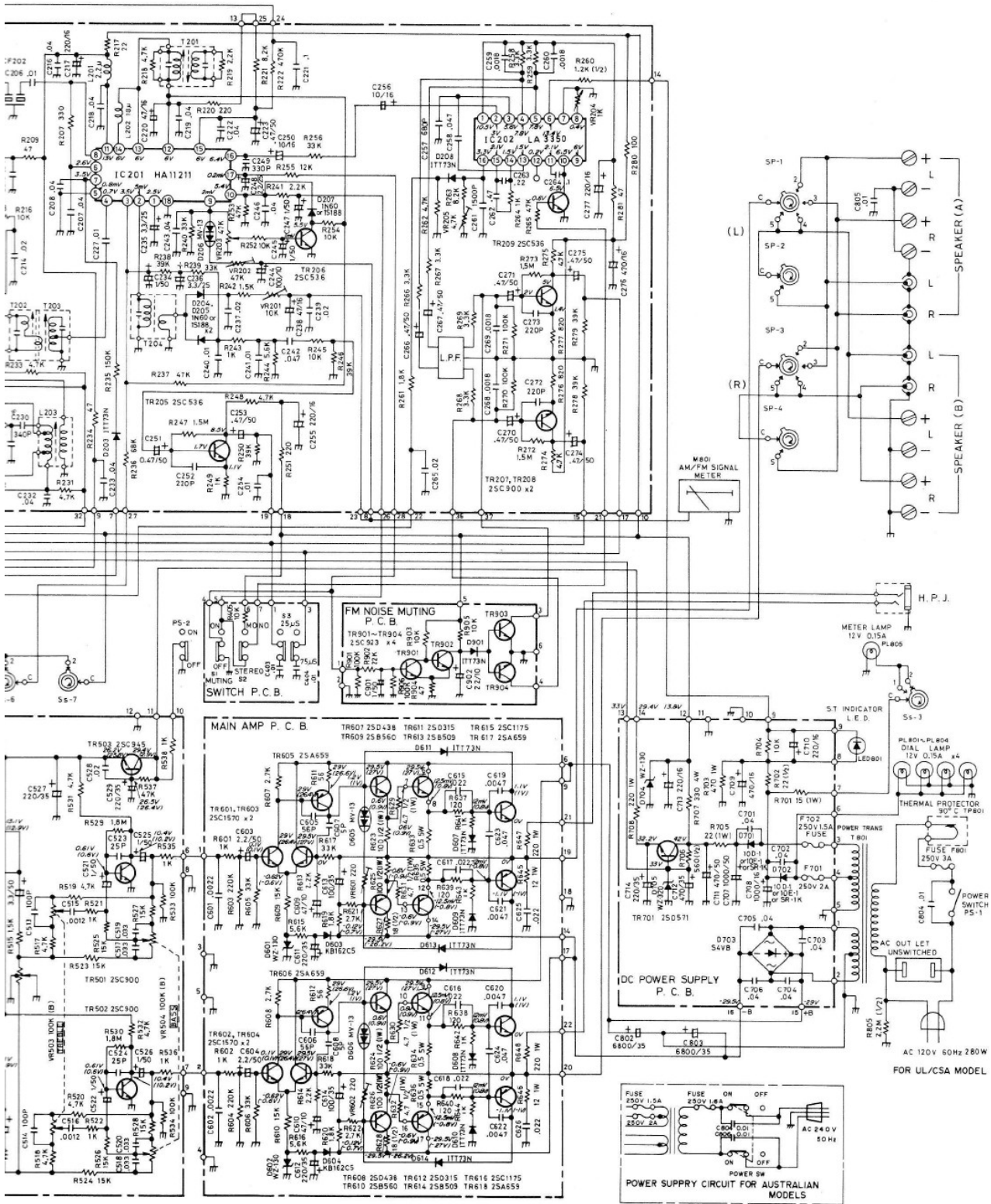


20. SCHEMATIC DIAGRAM

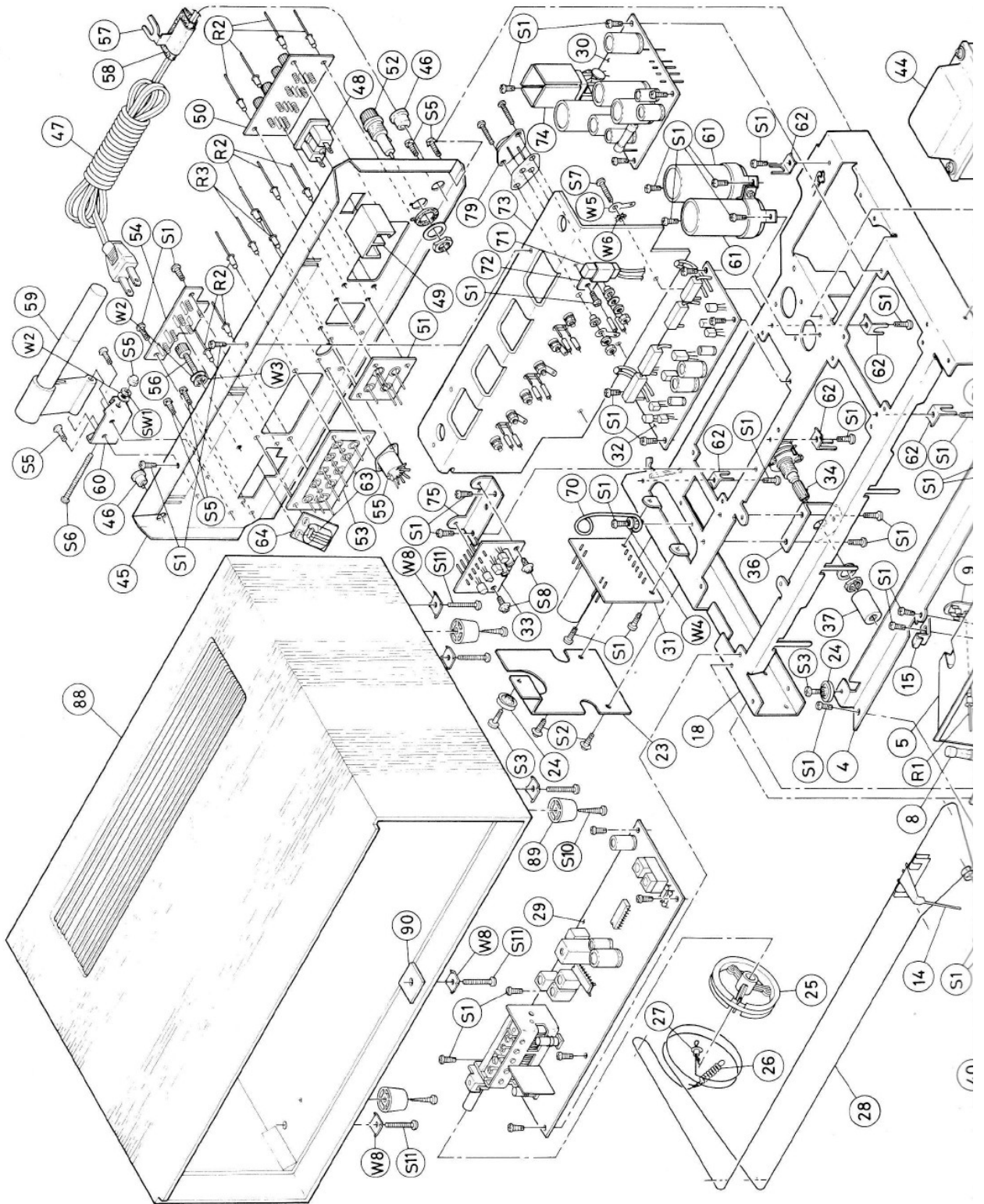


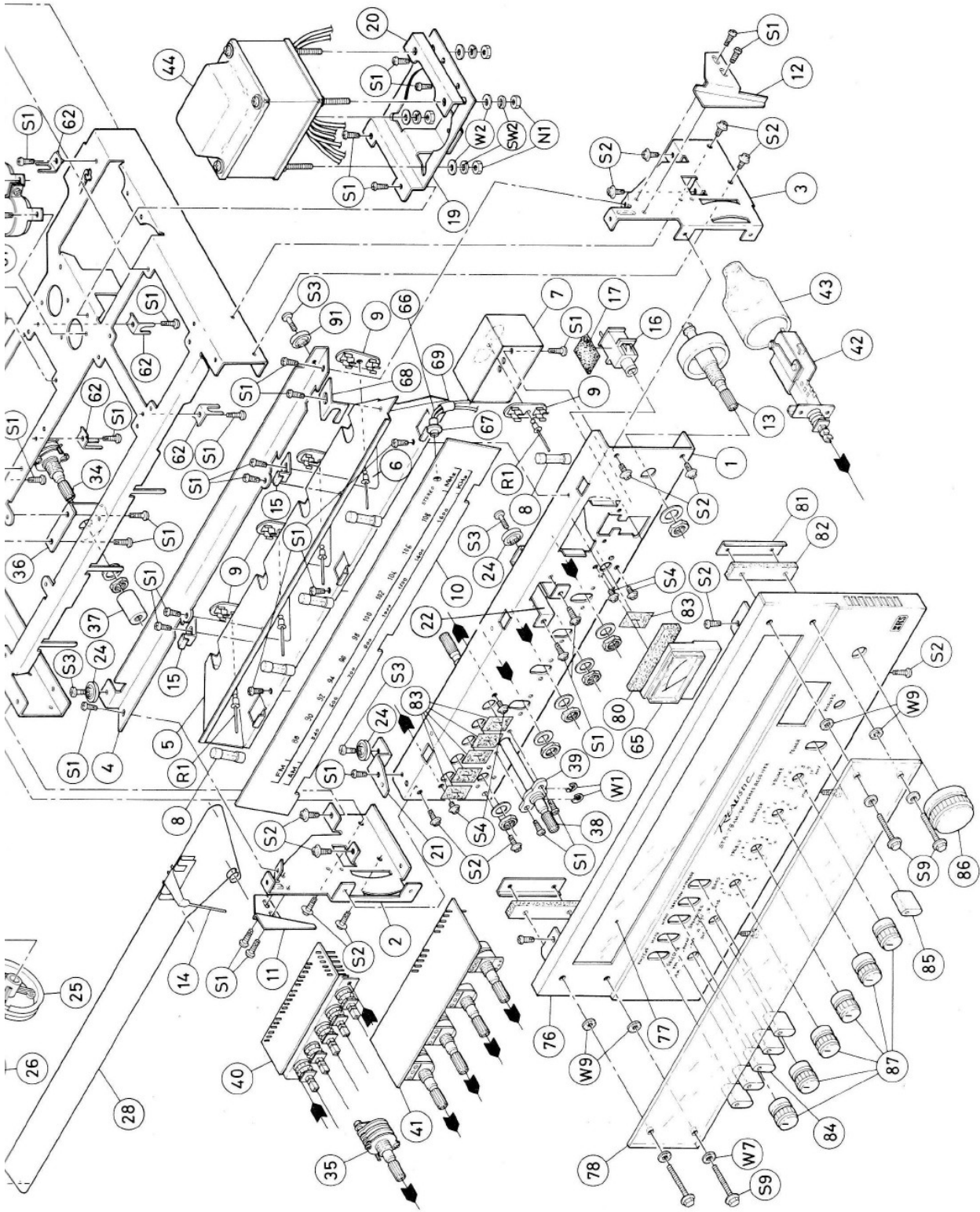
NOTE:

- (1) Ss-1 – Ss-7: FUNCTION SELECTOR SWITCH
POSITION; 1 – AM, 2 – FM, 3 – PHONO, 4 – AUX, C – COMMON.
- (2) Ps-1 – Ps-2: POWER SWITCH
- (3) Sp-1 – Sp-4: SPEAKER SELECTOR SWITCH.
POSITION: 1 – OUT, 2 – A, 3 – A, REV, 4 – B, 5 – A + B
- (4) ALL RESISTANCE VALUES ARE INDICATED IN "OHM". (K = 10^3 OHM, M = 10^6 OHM)
- (5) ALL CAPACITANCE VALUES ARE INDICATED IN " μ F". (P = 10^{-6} μ F)
- (6) () VALUES IN MAIN AMP STAGE ARE USED FOR C.S.A. MODELS ONLY.
- (7) ALL VOLTAGES ARE MEASURED TO CHASSIS GROUND WITH A VOLTMETER (10 K OHM/V).
- (8) VOLTAGES ARE MEASURED UNDER TWO CONDITIONS: WITH NO INPUT AND AT 22 W (1 kHz) OUTPUT POWER (INSIDE PARETHESIS).



21. EXPLODED VIEW





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