REALISTIC®

Service Manual

31-2084

STA-2000D

AM/FM STEREO RECEIVER

Catalog Number : 31-2084

CUSTOM MANUFACTURED FOR RADIO SHACK TC A DIVISION OF TANDY CORPORATION

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(1) ELECTRICAL PERFORMANCE SPECIFICATIONS

AM BAND

Note: 1. Output readings are taken across a non-reactive 47 K ohm load.
2. Output is measured at TAPE OUT 1 Terminals.
3. The Generator output shall terminate in an IRE loop and pointing towards rear of the Receiver.
4. Standard Modulation: 400 Hz, 30 % Mod.

	UNIT	NOMINAL	LIMIT
Range	(kHz)	515-1650	520-1620
IF	(kHz)	455	----
Antenna Sensitivity for S/N 20 dB at 600 kHz	(μV/m)	200	400
at 1000 kHz	(μV/m)	200	400
at 1400 kHz	(μV/m)	200	400
(terminal sensitivity)	(μV)	10	----
S/N Ratio at 5 mV/m Input 1000 kHz	(dB)	45	40
Selectivity at S/N 6 dB Sens. 1000 kHz $\pm$ 10 kHz	(dB)	35	25
AGC Distortion at 1000 kHz, 100 mV/m, 80 % Mod.	(%)	1.8	5
AGC Figure of Merit at 1000 kHz	(dB)	58	48
IF Rejection at 600 kHz	(dB)	56	48
Image Rejection at 1400 kHz	(dB)	60	52
Band Width at 6 dB down, 1000 kHz	(kHz)	6.0	4.5-8
Distortion at 5 mV/m Input	(%)	1	3
Tapeout Level at 5 mV/m Input	(mV)	230	230 $\pm$ 2 dB
Fidelity Compensation at 5 mV/m Input (Mod. 1 kHz = 0 dB) $-$6 dB point	(Hz)	10-3300	25-2800
Whistle Modulation of 2nd and 3rd Harmonic at 1 mV/m and 5 mV/m Input	(%)	3	8
Calibration Accuracy at 600 Hz	(kHz)	----	$\pm$25
at 1400 kHz	(kHz)	----	$\pm$50
Spurious Response at 1000 kHz refered to 20 dB S/N Input	(dB)	60	40

Overload: With a radiated signal of 1 V/m the signal shall be tunable without undue distortion or breakup.

The oscillator shall not drift more than 10 kHz starting at 25 degrees C, up to 50 degrees C (at 1000 kHz).

The Set shall operate in satisfactory manner through a temperature range from 0 degrees C through plus 45 degrees C.

FM BAND

Note: 1. Output readings are across a non-reactive 47 K ohm load.
2. Output is measured at TAPE OUT 1 Terminals.
3. The signal voltage in this specification is the voltage appearing across the tuner input terminals. (IHF)
4. Standard Modulation: 1000 Hz, 75 kHz dev.

	UNIT	NOMINAL	LIMIT
Range	(MHz)	86.5-109	88-108
IF	(MHz)	10.7	----
IHF Sensitivity at 90 MHz	(μV)	1.7	2.8
at 98 MHz	(μV)	1.7	2.8
at 106 MHz	(μV)	1.7	2.8
50 dB Quieting Sensitivity at 90, 98 and 106 MHz	(μV)	2.0	3.5
S/N Ratio at 1 mV Input, 98 MHz	(dB)	70	65
Limiting Sensitivity 3 dB, 98 MHz	(μV)	1.5	2
IF Rejection at 90 MHz	(dB)	95	80
Image Rejection at 106 MHz	(dB)	80	70
Spurious Response	(dB)	90	75
Capture Ratio	(dB)	1.5	2.5
ACA at $\pm$400 kHz, 50 μV Input	(dB)	75	60

	UNIT	NOMINAL	LIMIT
FM Mono Distortion at 98 MHz, 75 kHz dev.	(%)	0.2	0.5
Calibration Accuracy at 90 MHz	(kHz)	----	±300
at 98 MHz	(kHz)	----	±300
at 106 MHz	(kHz)	----	±300
AFC Holding Range at 98 MHz	(kHz)	±250	±330
Temperature Range for Satisfactory operation	(degree C)	----	0-45
AM Suppression FM: 75 kHz dev. AM: 30 % Mod.	(dB)	55	48
Maximum Signal Handling Capacity	(V)	0.2	0.1
Tapeout Level at 1 mV, 75 kHz dev.	(mV)	640	640 ± 2 dB
Muting Sensitivity	(μV)	2.5	2-6
Frequency Response at 10 kHz	(dB)	−13.66	−13.66 ± 2 dB

All sets must meet radiation regulation requirements (FCC).
Frequency response must meet the 75 μ sec de-emphasis

FM MPX SECTION

NOTE: 1. Output readings are taken across a non-reactive 47 K ohm load.
2. Output is measured at TAPE OUT 1 Terminals.
3. Signal voltage in this specification is the voltage appearing across the tuner input terminals. (IHF)
4. Standard Deviation: Main carrier (L + R) 33.75 kHz (45 %)
Sub carrier (L − R) 33.75 kHz (45 %)
Pilot 19 kHz 6 kHz (8%)
Modulation Frequency 1000 Hz

		UNIT	NOMINAL	LIMIT
Stereo Indicator Sensitivity		(μV)	2.5	2-6
Stereo Separation at 1 mV Input	100 Hz	(dB)	35	30
	1 kHz	(dB)	48	33
	10 kHz	(dB)	33	28
Stereo Distortion at 1 mV Input, 1 kHz		(%)	0.3	0.7
Sub Carrier Rejection Ratio (38 kHz)		(dB)	60	54
SCA Rejection Ratio		(dB)	60	54
Stereo Tape Out Level		(mV)	600	600 ± 2 dB
Effect of FM MPX Filter (Separation at 10 kHz)		(dB)	10	10 ± 2.5 dB

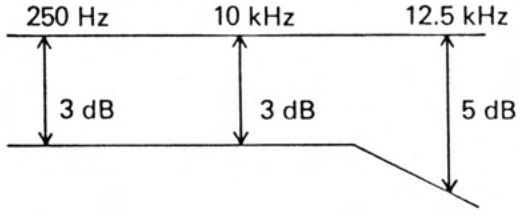
DOLBY FM SECTION

NOTE: 1. Output is measured at SPEAKER Terminals.
2. Output Level : 1 watt at 8 ohm load
3. Standard Modulation:
Stereo Deviation Main Carrier 37.5 kHz (50%) dev.
Pilot 19 kHz 6.75 kHz (9%) dev.
Modulation Frequency 400 Hz
Input Level 1 mV
4. TONE Control: Flat Position

	UNIT	NOMINAL	LIMIT
Signal-to-Noise Ratio with CCIR Filter Dolby FM Switch: OFF	(dB)	65	60
Dolby FM NR Effect, Dolby FM Switch: ON	(dB)	4.0	$4.0^{+0.5}_{-1.5}$

Frequency Response with DOLBY FM Switch: ON
Dolby Level : −15 dB and −25 dB points

Must meet Group "B"
(see illustration below)



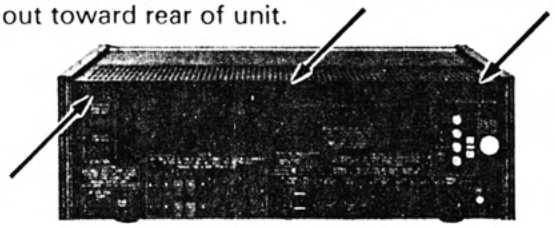
AUDIO SECTION

	UNIT	NOMINAL	LIMIT
Input Impedance PHONO Mag.	(K ohm)	50	----
AUX-1	(K ohm)	100	----
AUX-2	(K ohm)	100	----
Tape In-1	(K ohm)	100	----
Tape In-2	(K ohm)	100	----
Output Power THD 0.18% Both Channels			
Drive at 1 kHz, 8 ohms	(W)	82	78
Power Bandwidth THD 0.18% Both Channels			
Driven from 20 Hz to 20 kHz	(W)	80	75
Audio Distortion at Rated Power (75 W) from			
20 Hz to 20 kHz 8 ohms, One Channel Driven	(%)	0.1	0.18
Harmonic Distoriton at 10 W from 20 Hz to 20 kHz	(%)	0.05	0.14
Sensitivity for 75 W Rated Power at 8 ohms			
PHONO Mag.	(mV)	2.2	3.5
AUX-1	(mV)	140	140 ± 2 dB
AUX-2	(mV)	140	140 ± 2 dB
Tape In-1	(mV)	140	140 ± 2 dB
Tape In-2	(mV)	140	140 ± 2 dB
Frequency Response at AUX-1, 5 W ± 2 dB	(Hz)	15-25k	20-20 k
Bass Action at 100 Hz	(dB)	± 10	± 10 ± 2 dB
Treble Action at 10 kHz	(dB)	± 10	± 10 ± 2 dB
Minimum Volume Hum and Noise	(mV)	0.8	1.5
Maximum Volume Hum and Noise (AUX-1)	(mV)	15	35
4.7 K ohm termination			
Signal-to-Noise Ratio			
PHONO Mag. (Input Short)	(dB)	70	60
AUX-1 (Input Short)	(dB)	75	65
AUX-2 (Input Short)	(dB)	75	65
Tape In-1 (Input Short)	(dB)	75	65
Tape In-2 (Input Short)	(dB)	75	65
Cross-Talk at AUX-1 at 1 kHz	(dB)	65	55
(Input loaded with 4.7K ohm)			
Loudness Bass Compensation at 100 Hz, −30 dB Volume	(dB)	+6	+6 ± 2 dB
Level Difference of each Channel	(dB)	0	1.5
Tapeout Level (4.7K ohm termination)			
PHONO Mag. (2.2 mV Input)	(mV)	140	140 ± 2 dB
AUX-1 (140 mV Input)	(mV)	140	140 ± 2 dB
AUX-2 (140 mV Input)	(mV)	140	140 ± 2 dB
Tape In-1 (140 mV Input)	(mV)	140	140 ± 2 dB
Tape In-2 (140 mV Input)	(mV)	140	140 ± 2 dB
PHONO Mag. Equalization Response			
at 100 Hz	(dB)	RIAA	RIAA ± 1.5
at 10 kHz	(dB)	RIAA	RIAA ± 1.5
PHONO Mag. Overload at 1 kHz	(mV)	200	150
Tapeout Level (DIN Jack) (3.3K ohm termination)			
AM: 400 Hz, 30 % Mod. 5 mV Input	(mV)	3.3	3.3 ± 2.5 dB
FM: 1000 Hz, 22.5 kHz dev. 1 mV Input	(mV)	3.3	3.3 ± 2.5 dB
PHONO Mag. 3.3 mV Input	(mV)	3.3	3.3 ± 2.5 dB
AUX 210 mV Input	(mV)	3.3	3.3 ± 2.5 dB

NOTE: 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.

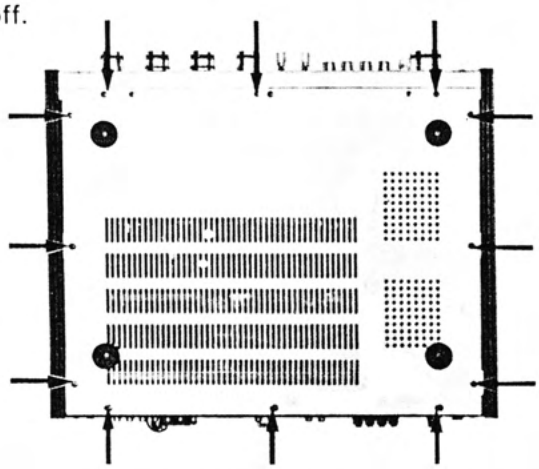
(2) DISASSEMBLY INSTRUCTIONS

1) To remove the Top Cover (Metal plate)
Remove three pan screws from the upper Back Panel as shown in Figure A.
Then slide Top Cover out toward rear of unit.



(Figure A)

2) Remove the Bottom Cover (Metal plate) as follows:
Turn the Receiver upside down and remove twelve pan screws from the bottom board as shown in Figure B.
Lift the Bottom Cover off.

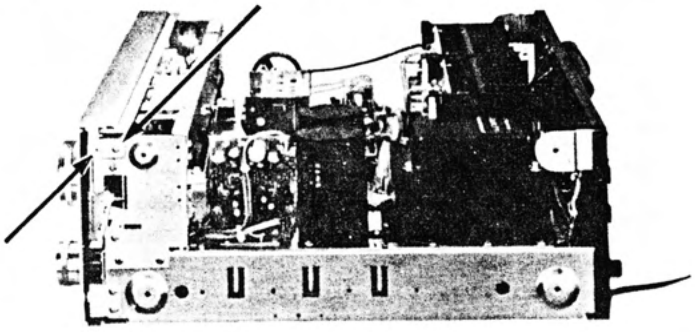


(Figure B)

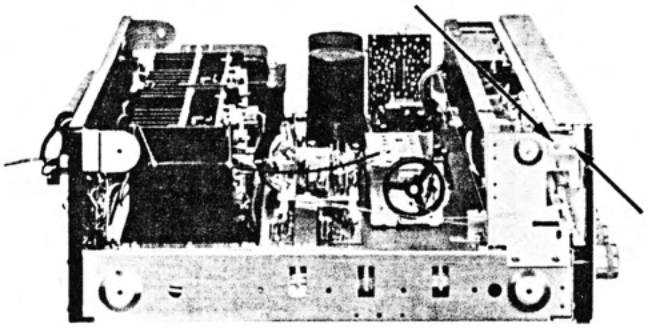
3) To remove the wooden sides from the Cabinet (Figure C)
Remove four screws from each side of the Cabinet. Be careful not to loose the screw inserts when the screws are removed.

(Figure C)

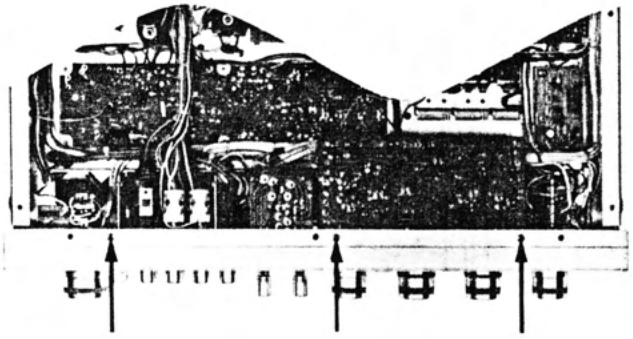
4) To remove the Front Panel (Aluminum Panel)
a) Remove the Top Cover, Bottom Cover and wooden sides from the Cabinet as described in 1), 2) and 3).
b) Remove four pan screws from the Front Panel — two screws from the left side and two screws from the right side. (Figure D1, D2)
c) Remove three pan screws from bottom of the Front Panel. (Figure D3)
d) Loosen the Tuning Knob screw with an Allen Wrench and remove Tuning Knob. All other knobs can be simply pulled off. (Figure D4)



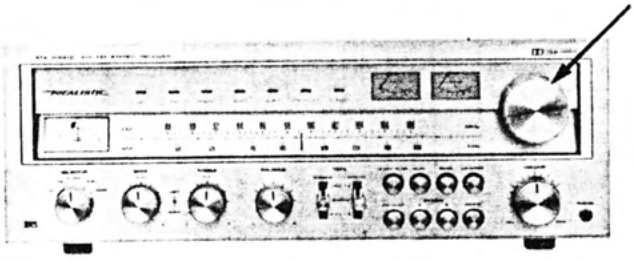
(Figure D1)



(Figure D2)



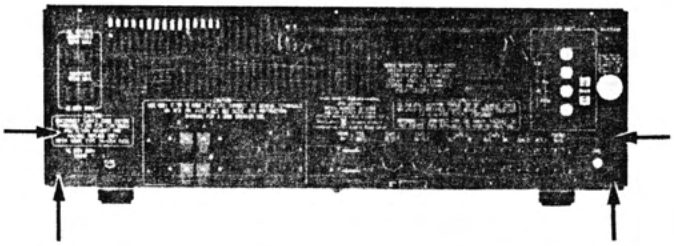
(Figure D3)



(Figure D4)

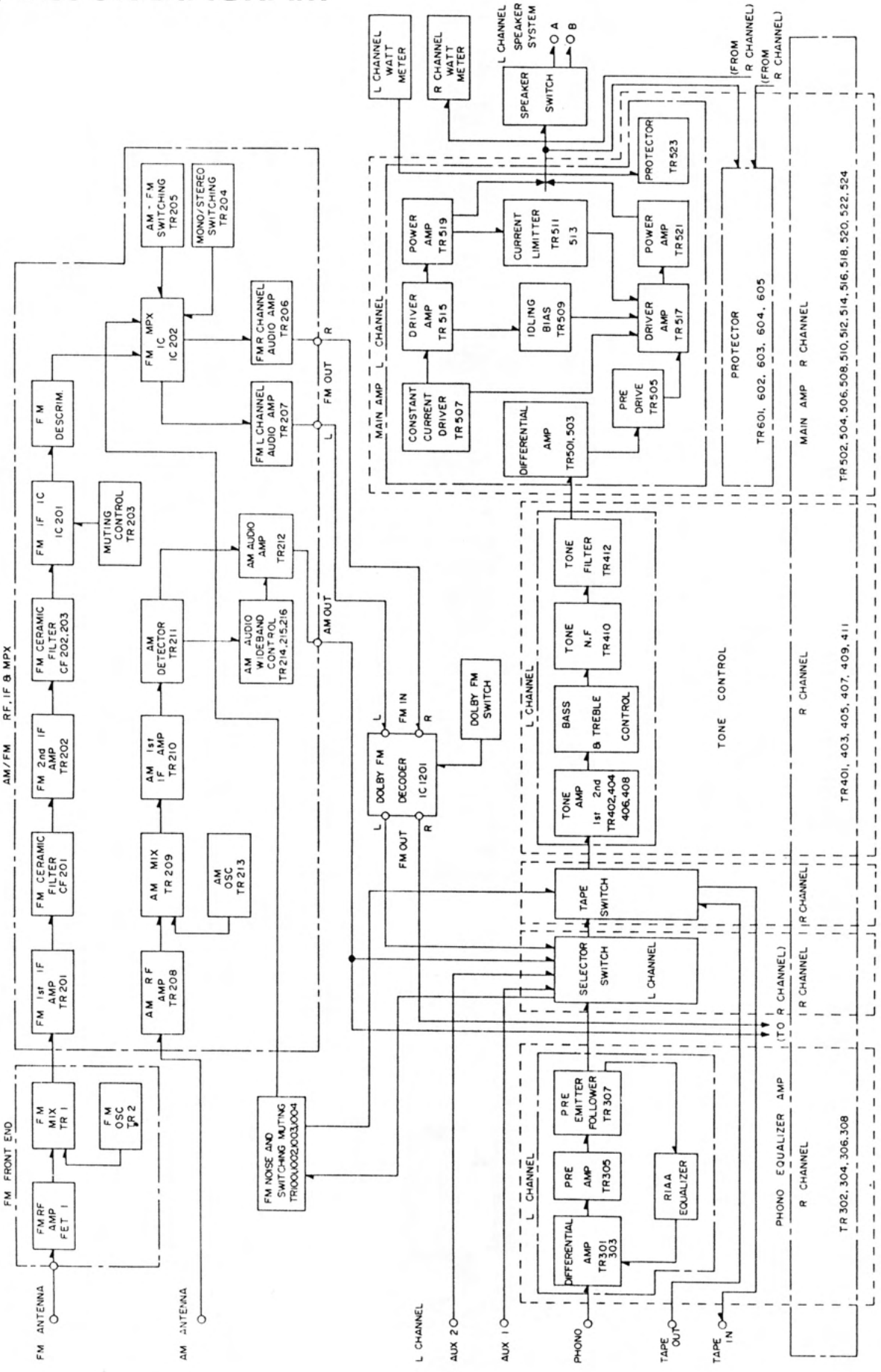
5) To remove Rear Panel from chassis.
Remove four pan screws from Rear Panel. (Figure E)

Caution: Before removing the Rear Panel, you'll need to unsolder four capacitors joining the Rear Panel and the chassis bottom

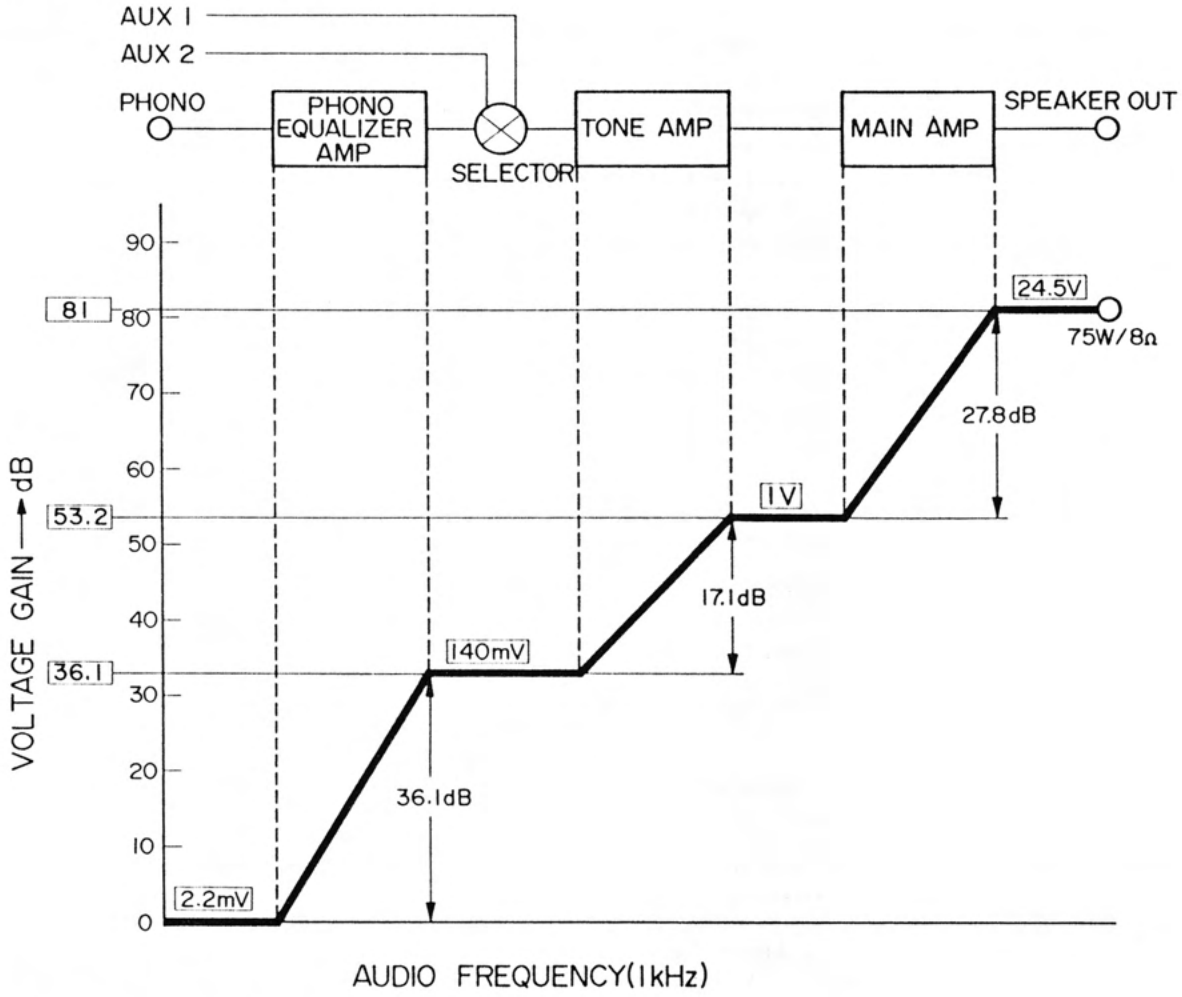


(Figure E)

(3) BLOCK DIAGRAM

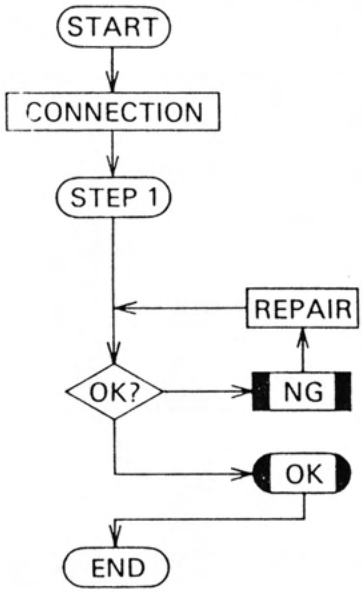


(4) LEVEL DIAGRAM



(5) CIRCUIT OPERATION CHECK

1) POWER SUPPLY OPERATION CHECK



Connect AC Cord to 120 V AC, 60 Hz.

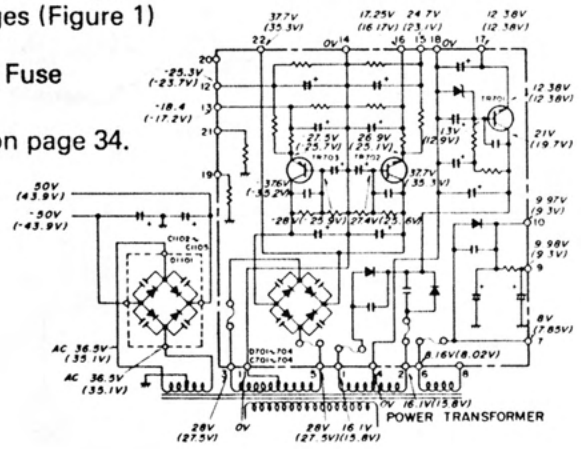
Power Switch "ON" and Pilot Lamps light, Check the Power Supply Voltages (Figure 1)

1) Check Power Supply P.C.B., Fuse and Power Transformer.
2) See TROUBLESHOOTING on page 34.

DC Voltages are not correct.

DC Voltages are correct.

Proceed to next section.



(Figure 1)

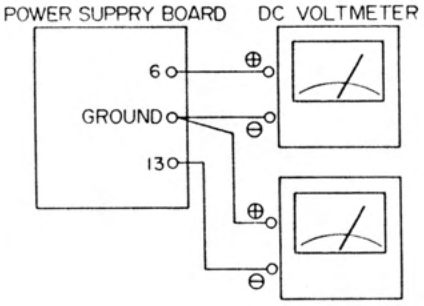
2) AUDIO SECTION OPERATION CHECK

(1) MAIN AMP. OPERATION CHECK

START

CONNECTION

Connect 8 Ω Load to Speaker Output.
Connect DC Voltmeters to Main Amp. Board Pin No. 6 and Ground (PLUS +) and Pin No. 13 and Ground (MINUS −).
(Both Left and Right Boards) (See Figure 2)



(Figure 2)

STEP 1

Check Power Supply voltage with no input (must be ± 50 V).

REPAIR

(1) Check D1101, C1106 or C1107.
(2) Check for short-circuits.
(3) See TROUBLESHOOTING.

OK? — NG

DC Voltage is not ± 50 V.

OK

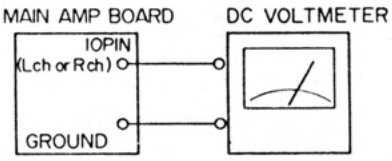
DC Voltage is ± 50 V.

ADJUSTMENT

Adjust DC Balance and Idling Current.
See ALIGNMENT INSTRUCTIONS on page 20.

CONNECTION

Connect 8 Ω load to Speaker Output.
Connect DC Voltmeter to Main Amp. P.C.B. as shown in Figure 3.



(Figure 3)

STEP 2

Check for Balance of DC voltage at L and R channel output terminals (within ± 20 mV).

REPAIR

(1) Readjust VR501 and VR502.
(2) See TROUBLESHOOTING.

OK? — NG

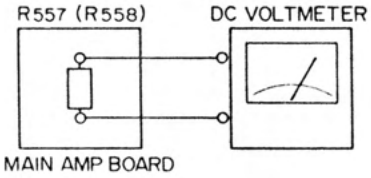
DC Voltage over ± 20 mV.

OK

DC Voltage within ± 20 mV.

CONNECTION

Connect 8 Ω Load to Speaker Output.
Connect DC Voltmeter to Main Amp. P.C.B. as shown in Figure 4.



(Figure 4)

STEP 3

Check the Idling current of Main Amp:
Check the DC Voltage across Emitter resistor R557(L ch) and R558(R ch); should be 17.5 mV ± 3.5 mV.
(Adjust : VR 503 (L ch) and/or VR 504 (R ch))

REPAIR

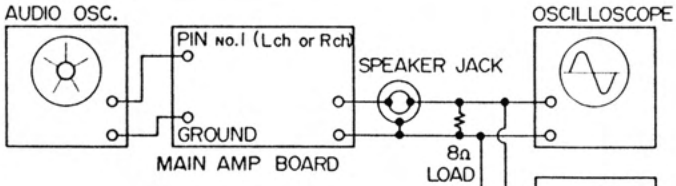
(1) Readjust VR 503 and/or VR504.
(2) Check the Bias circuit of D505, R531 (L ch) and/or D506, R532 (R ch).
(3) Check TR 509 (L ch) and TR 510 (R ch).
(4) Check TR 507 (L ch) and TR 508 (R ch).
(5) Check for short-circuits on Main P.C.B.

OK? — NG — DC Voltage is above 21 mV or below 14 mV.

OK — DC Voltage is 17.5 mV ± 3.5 mV

CONNECTION

Connect 8 Ω Load to Speaker Output.
Connect Audio Osc. to Main Amp. input, Pin No. 1 of both left and right channels. See Figure 5.



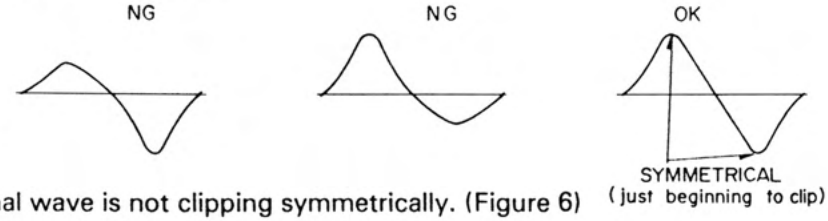
(Figure 5)

STEP 4

Check for symmetrical clipping of Output Signal wave shape.
Adjust output from Audio Osc. to produce clipping in the output waveform (should be about 900 mV — 1.2 V)

REPAIR

(1) Check TR 515, 517, 519, 521 (L ch) and TR 516, 518, 520, 522 (R ch).
(2) Check STEP 2 and STEP 3.
(3) Check Main Amp. circuits.



(Figure 6)

OK? — NG — Output signal wave is not clipping symmetrically. (Figure 6)

OK — Symmetrically clipping (balanced) Output signal wave. (Figure 6)

STEP 5

Check the Main Amp. Gain (designed level for Main Amp is about 28 dB).
Adjust output from Audio Osc. to produce 75 watts rated output power (both channels driven). (Figure 5)

REPAIR

(1) Check Main Amp. circuits.
(2) Check STEPs 1, 2, 3 and 4.

OK? — NG — Input level is not 1 V ± 2 dB

OK — Input level is at least 1 V ± 2 dB for rated output power.

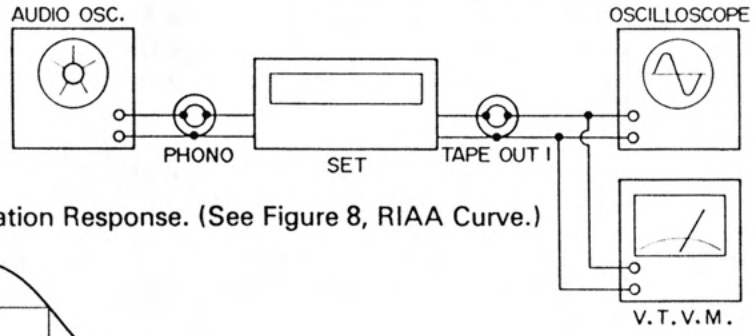
END — Proceed to next section.

(2) PRE AMP. OPERATION CHECK

START

CONNECTION

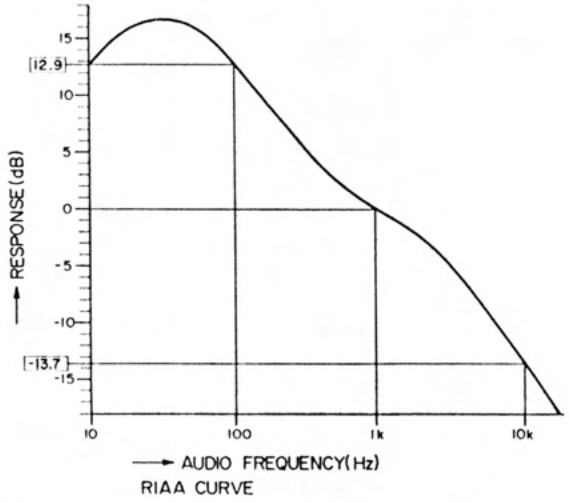
Set SELECTOR Switch to PHONO.
Connect Audio Osc. to PHONO Input.
Connect Oscilloscope and V.T.V.M. to TAPE OUT 1 Jack. (See Figure 7.)



(Figure 7)

STEP 1

Check the PHONO Equalization Response. (See Figure 8, RIAA Curve.)



(Figure 8)

OK? → NG → REPAIR

(1) Check TR301, 303, 305, 307 (L ch) and TR302, 304, 306, 308 (R ch).
(2) Check C309, 311, R315, 317 (L ch) and C310, 312, R316, 318 (R ch).
(3) Check PRE Amp. circuits.

Equalization Response at 100 Hz does not fall within + 13.11 (RIAA) ± 1.5 dB and 10 kHz does not fall within −13.75 (RIAA) ± 1.5 dB.

OK

Equalization Response falls within + 13.11 (RIAA) ± 1.5 dB at 100 Hz and −13.75 (RIAA) ± 1.5 dB at 10 kHz.

END

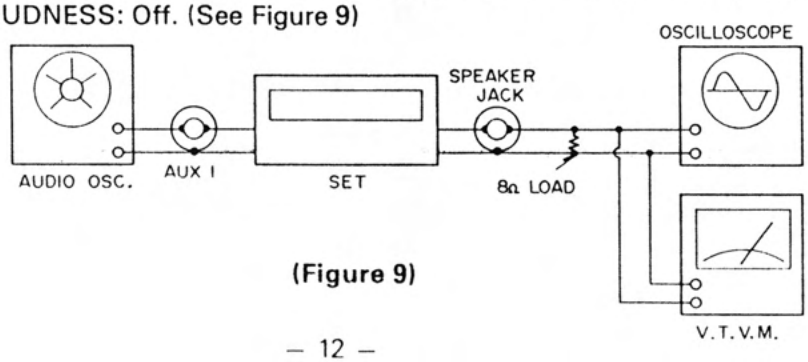
Proceed to next section.

(3) TONE CONTROL OPERATION CHECK

START

CONNECTION

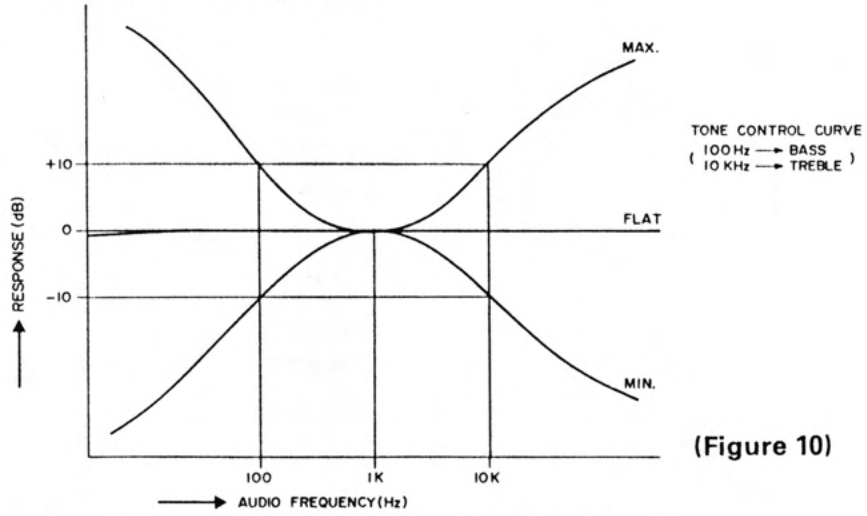
Set SELECTOR Switch to AUX 1 position.
Connect Audio Osc. to AUX 1 input jack.
Connect Oscilloscope and V.T.V.M. to Speaker Jack on Set.
Speaker Impedance = 8 ohms (OUTPUT : about 5 watts)
TAPE DUBBING: SOURCE, TAPE MONITOR: SOURCE, MODE Switch:
LOUDNESS: Off. (See Figure 9)



(Figure 9)

STEP 1

Check BASS Action at 100 Hz. (Figure 10)



(Figure 10)

REPAIR — Check Bass Control circuit on TONE CONTROL P.C.B. and see TROUBLESHOOTING.

OK? — NG — Frequency Response does not fall within ± 10 ± 2 dB.

OK — Frequency Response falls within ± 10 ± 2 dB.

STEP 2

Check TREBLE Action at 10 kHz. (Figure 10)

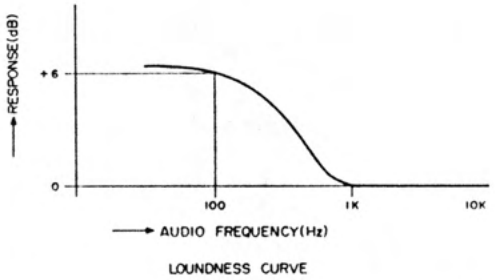
REPAIR — Check Treble Control circuits on TONE CONTROL P.C.B. and see TROUBLESHOOTING.

OK? — NG — Frequency Response does not fall within ± 10 ± 2 dB.

OK — Frequency Response falls within ± 10 ± 2 dB.

STEP 3

Check LOUDNESS compensation at −30 dB Volume position from rated power. (Figure 11)



(Figure 11)

REPAIR — Check Loudness circuit and see TROUBLESHOOTING.

OK? — NG — Loudness Compensation does not fall within +6 ± 2 dB at 100 Hz.

OK — Loudness Compensation falls within +6 ± 2 dB.

END — Proceed to the next section.

(4) PROTECTOR CIRCUITS OPERATION CHECK

START

STEP 1 — Check for "click" sound of Relay L601 when Power switch is set to "ON". (actives after about a three-second delay)

REPAIR
(1) Check Power Relay L 601.
(2) Check TR601 and TR602.
(3) Check C602 and R603 (Time Constant circuits).

OK? — NG — Relay circuit does not work.

OK — Relay circuit works.

ADJUSTMENT — Adjust VR603 (See ALIGNMENT INSTRUCTIONS section on page 20.).

CONNECTION — Connect Audio Osc. to AUX 1 Input Jack.
Connect 8 Ω Load to Speaker Output terminal. (Output: 5 W)
Connect Oscilloscope and V.T.V.M. to Speaker terminal (Figure 12)

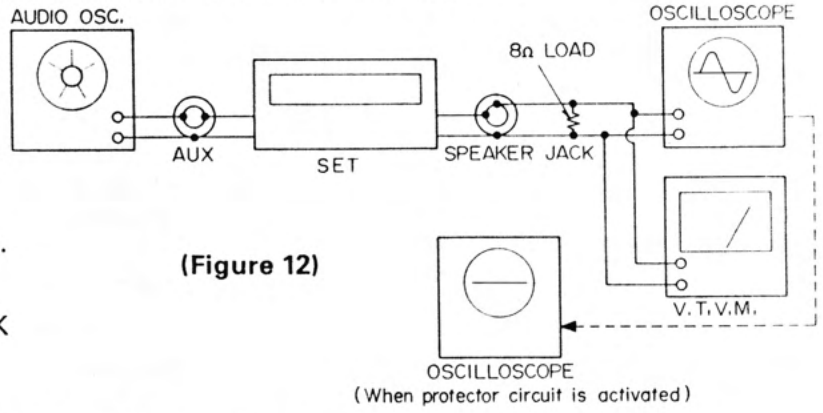
STEP 2 — Check for no output after output is shorted.

REPAIR — Check PROTECTOR circuits and see TROUBLESHOOTING

OK? — NG — Protector circuit does not work.

OK — Protector circuit works.

END — Proceed to next section.



(Figure 12)

(5) WATT METER OPERATION CHECK

START

ADJUSTMENT — Adjust VR601, 605 (L ch) and VR602, 604 (R ch)
(See ALIGNMENT INSTRUCTIONS section on page 21)

CONNECTION — Connect Audio Osc. (1 kHz) to AUX 1 Input Jack.
Connect 8 Ω Load to Speaker output terminal.
Connect Oscilloscope and V.T.V.M. to Speaker terminal
(Output level : 1 watt and 100 watts) (Figure 13)

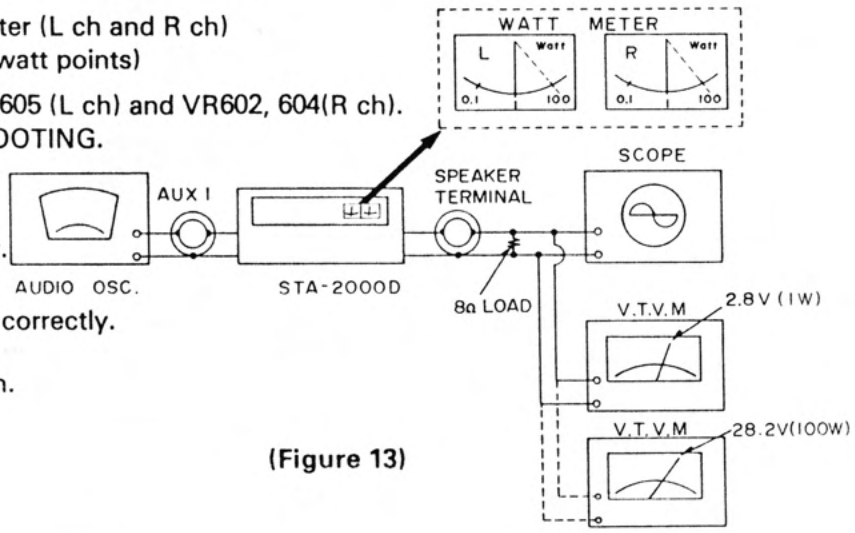
STEP 1 — Check Watt Meter pointer (L ch and R ch)
(Check 1 watt and 100 watt points)

REPAIR — Readjust VR601, 605 (L ch) and VR602, 604(R ch).
See TROBLESHOOTING.

OK? — NG — Watt Meter pointer does not indicate correctly.

OK — Watt Meter pointer indicates correctly.

END — Proceed to next section.



(Figure 13)

3) RF and IF OPERATION CHECK

(1) AM OPERATION CHECK

START

ADJUSTMENT — Adjust for AM IF/RF Alignment (See AM ALIGNMENT Section on page 23).

CONNECTION — Set SELECTOR Switch to AM position.
Connect standard loop antenna to AM SG and radiate signal into AM Ferrite Antenna L 1101.
Connect Oscilloscope, Distortion Meter and V.T.V.M. to TAPE OUT 1 jack on Set.
AM SG: 400 Hz, 30 % modulation. (Figure 14)

STEP 1 — Check that the AM coverage lowest dial pointer is under 520 kHz and highest position is over 1620 kHz.

REPAIR — Readjust AM coverage (See page 23 for AM Alignment)

OK? NG — Coverage is within 520 kHz — 1620 kHz.

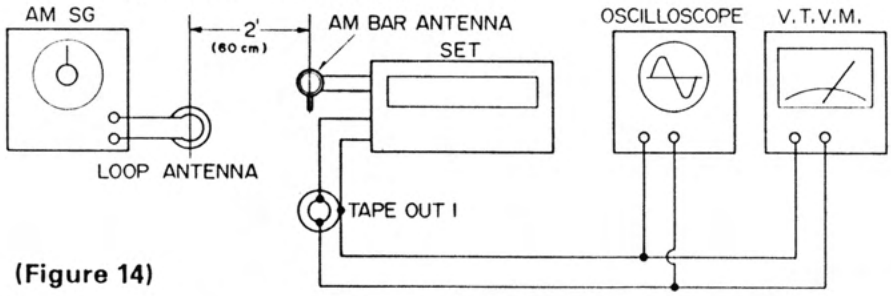
OK — Coverage is at least 520 kHz — 1620 kHz.

STEP 2 — Check Antenna Sensitivity for S + N/N 20 dB at 600, 1000 and 1400 kHz.

REPAIR — Readjust AM Tracking (See page 23 for AM Alignment)
See TROUBLESHOOTING.

OK? NG — AM Sensitivity is less than 400 μV/m.

OK — AM Sensitivity is better than 400 μV/m.



(Figure 14)

STEP 3 — Check AM Distortion (Input level to 5 mV/m).

REPAIR — (1) Readjust AM IF/RF Alignment (on page 23).
(2) Check AM RF/IF circuits.

OK? NG — Distortion is greater than 3 %.

OK — Distortion is less than 3 %.

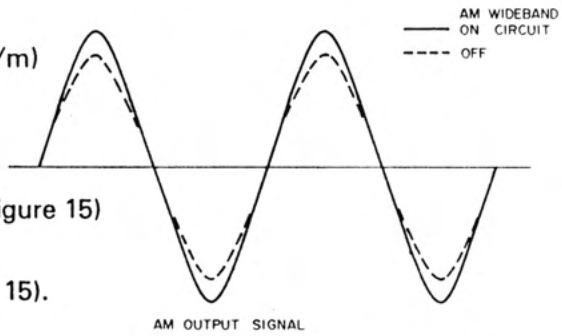
STEP 4 — Check AM Tape Out level (Input level to 5 mV/m).

REPAIR — (1) Readjust AM IF/RF Alignment (on page 23).
(2) Check and change/select value of R 290.
(3) Check AM IF Detector circuits.

OK? NG — Tape Out level does not fall within 230 mV ± 2 dB.

OK — Tape Out level falls within 230 mV ± 2 dB.

STEP 5 — Check the AM Wide Band effect
(Modulation : 2 kHz, 30 % Input : 2 mV/m)



REPAIR — (1) Readjust VR 205.
(2) See TROUBLESHOOTING.

OK? — NG — Wide Band has no effect (See Figure 15)

OK — Wide Band is active (See Figure 15).

(Figure 15)

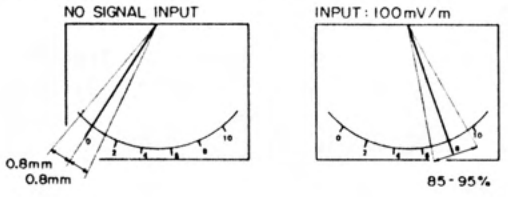
STEP 6 — Check the AM Signal Meter pointer.
(Input level for check points --- (1) no signal —0 ± 8 m/m,
(2) 100 mV/m — 85—90 %)

REPAIR — (1) Readjust VR 204 and VR 206.
(2) Check the AM IF circuits.

OK? — NG — Signal Meter pointer does not indicate correctly. (Figure 16)

OK — Signal Meter pointer indicates correctly. (Figure 16)

END — Proceed to next section.



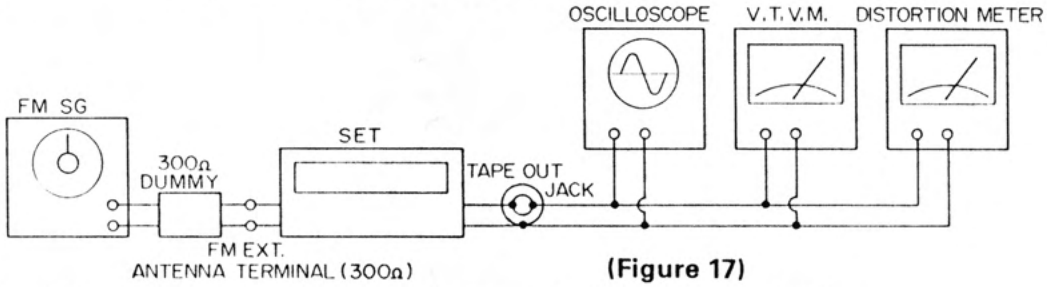
(Figure 16)

(2) FM RF/IF OPERATION CHECK

START

ADJUSTMENT — Adjust FM Alignment (See FM Alignment Section on page 24 through 28.) (FM IF/RF, FM MPX and Dolby FM sections).

CONNECTION — Set SELECTOR Switch to FM position.
Connect FM SG (1000 Hz, 75 kHz dev.) to FM 300 Ω Antenna Terminal.
Connect Oscilloscope, Distortion Meter and V.T.V.M. to TAPE OUT Jack. (Figure 17)



(Figure 17)

STEP 1 — Check that the low end coverage (pointer position) is 87.4 ± 0.25 MHz and highest pointer position is 109 ± 0.3 MHz.

REPAIR — (1) Readjust FM coverage (See FM RF/IF Alignment on page 24).
(2) Check FM RF circuits.

OK? — NG — Coverage is not correct.

OK — Coverage is correct.

STEP 2 — Check IHF Sensitivity at 90, 98 and 106 MHz.

REPAIR
(1) Readjust FM tracking (See FM RF/IF Alignment on page 24).
(2) See TROUBLESHOOTING.

OK? → NG — FM IHF sensitivity is less than 2.8 μV

OK — FM IHF sensitivity is better than 2.8 μV. (FM SG: 98 MHz)

STEP 3 — Check T.H. Distortion for MONO signal. (Input : 1 mV)

REPAIR
(1) Readjust RF/IF Alignment (on page 24).
(2) See TROUBLESHOOTING.

OK? → NG — T.H. Distortion is higher than 0.5%.

OK — T.H. Distortion is lower than 0.5%.

STEP 4 — Check Signal-to-Noise ratio. (Input signal: 1 mV) (FM SG: 98 MHz)

REPAIR
(1) Readjust RF/IF Alignment (on page 24).
(2) See TROUBLESHOOTING.

OK? → NG — Signal to Noise ratio is worse than 65 dB.

OK — Signal to Noise ratio is better than 65 dB.

STEP 5 — Check the Tuning Meter pointer.
1. Check that the Meter pointer is at center (0) position with no signal.
2. Check that tune-to-center-reading is also the point of minimum distortion. (SG: 98 MHz)

REPAIR
(1) Readjust RF/IF Alignment (on page 24).
(2) Check FM IF circuits.

OK? → NG — Meter pointer does not indicate correctly. (Figure 18)

OK — Meter pointer indicates correctly. (Figure 18)

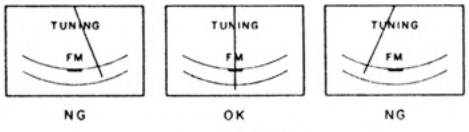
STEP 6 — Check Muting with 3 μV input at 98 MHz and MUTE switched "on".

REPAIR
(1) Readjust VR 201.
(2) See TROUBLESHOOTING.

OK? → NG — Muting level is not 3 μV ± 1 μV.

OK — Muting level is 3 μV ± 1 μV.

END — Proceed to next section.



FM TUNING METER

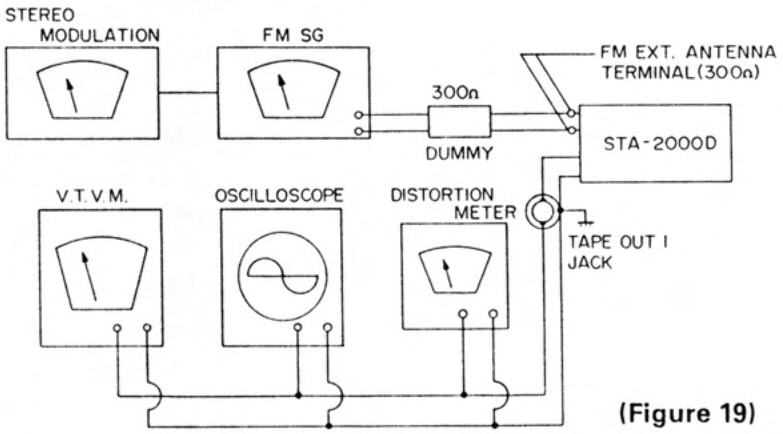
(Figure 18)

(3) FM MPX OPERATION CHECK

START

CONNECTION

Same equipment connection as Figure 17.
Connect FM Stereo SG to FM SG.
Stereo Modulation ----- 67.5 kHz dev. 8 % Pilot
Frequency ----- 98 MHz, 1 kHz mod. (Figure 19)



(Figure 19)

STEP 1 — Check Stereo indicator sensitivity (Input : near 2.5 μV)

- REPAIR ← NG ← OK? — (1) Readjust FM MPX Alignment (on page 26).
  (2) See TROUBLESHOOTING.
  NG: Stereo indicator sensitivity does not fall within 2-6 μV.
- OK: Stereo indicator sensitivity falls within 2-6 μV (normal sensitivity is 2.5 μV).

STEP 2 — Check Stereo Separation at 100, 1k and 10 kHz (input = 1 mV)

- REPAIR ← NG ← OK? — (1) Readjust FM MPX Alignment (on page 26).
  (2) See TROUBLESHOOTING.
  NG: Separation is worse than 30 dB at 100 Hz, 33 dB at 1 kHz and 28 dB at 10 kHz.
- OK: Separation is better than 30 dB at 100 Hz, 33 dB at 1 kHz and 28 dB at 10 kHz.

STEP 3 — Check FM MPX Filter (with FM MPX FILTER Switched "on", check the Separation at 10 kHz mod.)

- REPAIR ← NG ← OK? — (1) See TROUBLESHOOTING.
  NG: MPX Filter Separation does not fall within 10 dB ± 2.5 dB
- OK: MPX Filter Separation falls within 10 dB ± 2.5 dB

END — Proceed to next section.

(4) DOLBY FM OPERATION CHECK

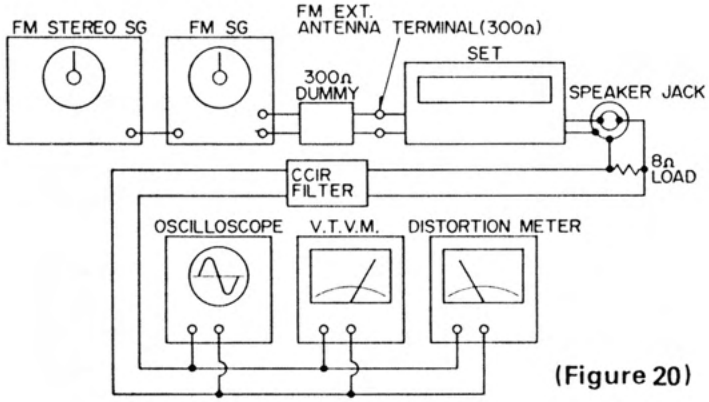
START

ADJUSTMENT

Adjust for Dolby FM Alignment (See Dolby FM Alignment section on page 27 and 28)

CONNECTION

Same equipment connection as Figure 19.
Connect Speaker Terminals to CCIR Filter input, and connect CCIR Filter output to Oscilloscope, V.T.V.M. and Distortion Meter.
Tone Control : Flat position
Output Power : 1 watt
(Figure 20)
FM Stereo Modulation : 27.5 kHz dev. pilot 9 %
Frequency : 400 Hz



(Figure 20)

STEP 1

Check the Dolby FM NR effect.
(Check the Signal to Noise ratio for Dolby FM switch ON and OFF.)

REPAIR

(1) Readjust Dolby FM Alignment.
(2) Check Dolby FM PCB. (See TROUBLESHOOTING)

OK?

NG

Signal-to-Noise ratio does not fall within 4 $^{+0.5}_{-1.5}$ dB comparing Dolby FM "on" with "off".

OK

Signal-to-Noise ratio falls within 4 $^{+0.5}_{-1.5}$ dB comparing Dolby FM "on" with "off".

STEP 2

Check the Frequency Response with Dolby FM Switch "on".
(Modulation level = (37.5 kHz + 6.75 kHz) — 25 dB position)

REPAIR

(1) Readjust Dolby FM Alignment.
(2) Check Dolby FM P.C.B. (See TROUBLESHOOTING)

OK?

NG

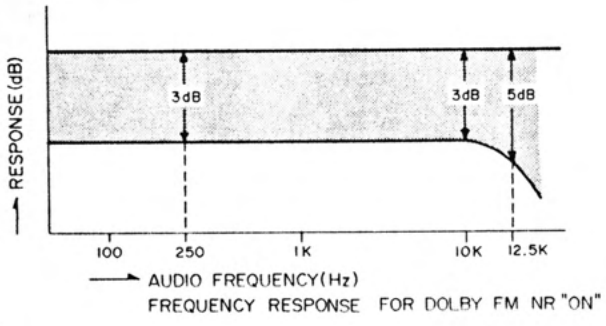
Frequency Response with Dolby FM "on" does not meet the Group "B" regulation. (See Figure 21)

OK

Frequency Response with Dolby FM "on" meets the Group "B" regulation. (See Figure 21)

END

Proceed to Alignment Section.



(Figure 21) FREQUENCY RESPONSE FOR DOLBY FM NR "ON"

(6) ALIGNMENT INSTRUCTIONS

AUDIO CIRCUIT ADJUSTMENT/CHECK

EQUIPMENT REQUIRED

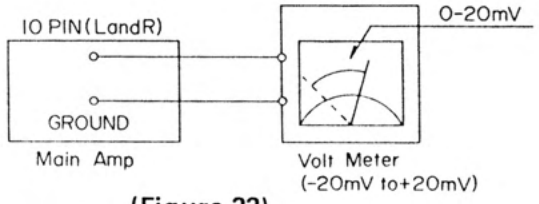
1. DC Voltmeter
2. Audio Oscillator
3. Oscilloscope
4. AC Voltmeter

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

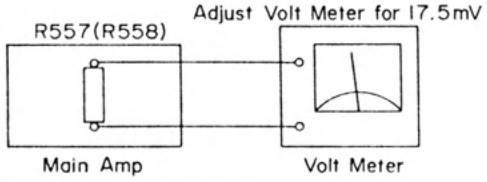
Note *Maintain voltage at 120 volts, AC 60 Hz.
*Set SELECTORs Switch to AUX 1.
*Set MODE Switch to STEREO.
*See P.C.B. illustration for alignment points/adjustments.

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 Fig. 22.	No signal	DC voltage should be less than 20 mV.	VR501 (L ch) VR 502 (R ch)
2	Idling current adjustment	DC Volt Meter	See Fig. 23.	No signal	Adjust voltage across Emitter resistors R 557 (L ch) and R 558(R ch) to 17.5 mV (8 ohm Load).	VR 503 (L ch) VR 504 (R ch)



(Figure 22)



(Figure 23)

RESET CIRCUIT ADJUSTMENT

STEP	ADJUSTMENT	EQUIPMENT	CONNECTION	AUDIO FREQ.	SETTING	LEVEL	ADJUSTMENT
1	Turn trimmer resistor VR 603 counterclockwise (minimum value).						
2		Audio Osc. V.T.V.M. Oscilloscope	See Figure 24.	1000 Hz	VOLUME: Max. BASS, TREBLE BALANCE: center	Adjust input to AUX 1 to get output level of about 6 volts (8 ohm load).	
3	Reset circuit adjustment.	Audio Osc. V.T.V.M. Oscilloscope	See Figure 24, 25.	1000 Hz	Same as above	Adjust VR 603 to output drops to zero (RESET comes "on") when output speaker terminals are shorted: DO NOT ADJUST PAST THIS POINT.	VR 603

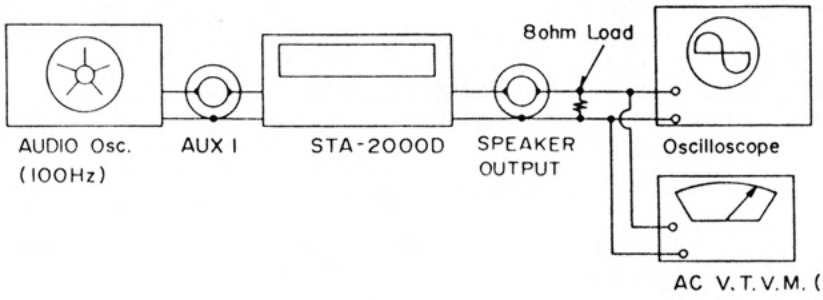


Figure 24

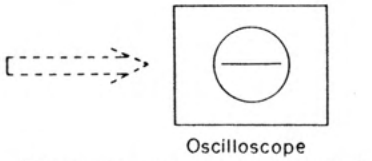


Figure 25

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

WATT METER ADJUSTMENT

STEP	ADJUSTMENT	EQUIPMENT	CONNECTION	AUDIO FREQ.	SETTING	LEVEL	ADJUSTMENT
1	WATT Meter level adjust-ment	Audio Osc. V.T.V.M. Oscilloscope	See Fig. 26.	1000 Hz	VOLUME: Max BASS, TREBLE BALANCE : center	Adjust input to AUX 1 to get output level of 2.8 V (1 W) (8 ohm load).	VR 601 (L ch) VR 602 (R ch) for 1 watt meter indication.
2	Same as above	Same as above	See Fig. 26.	1000 Hz	Same as above	Adjust input to AUX 1 to get output level of 28.2 V (100W) (8Ω load)	VR 605 (L ch) VR 604 (R ch) for 100 watt meter indication.

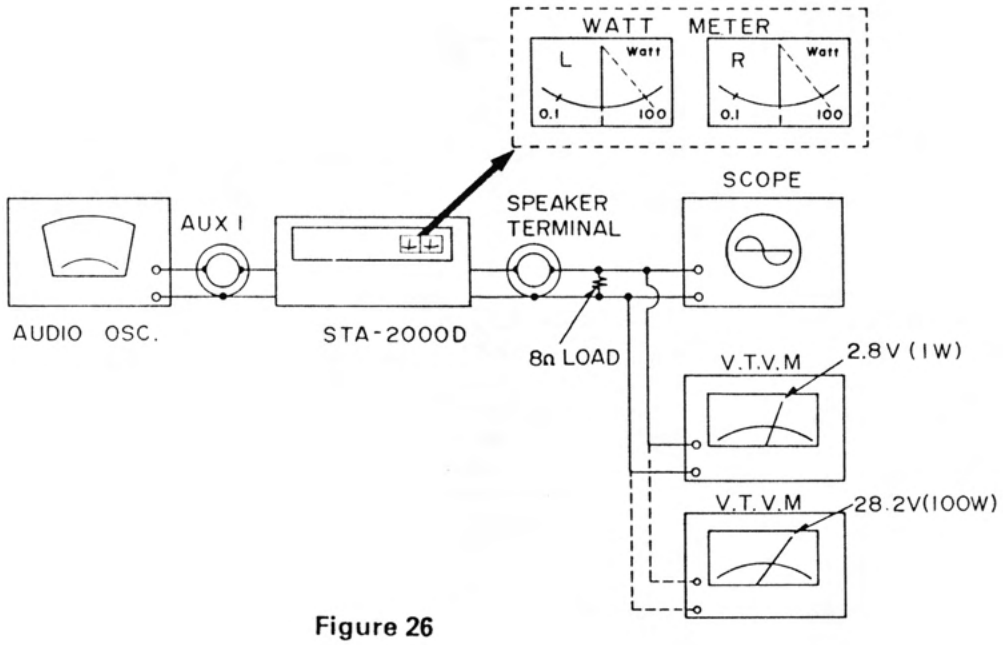


Figure 26

AM-FM IF & MPX COIL & TRIMMER LOCATIONS

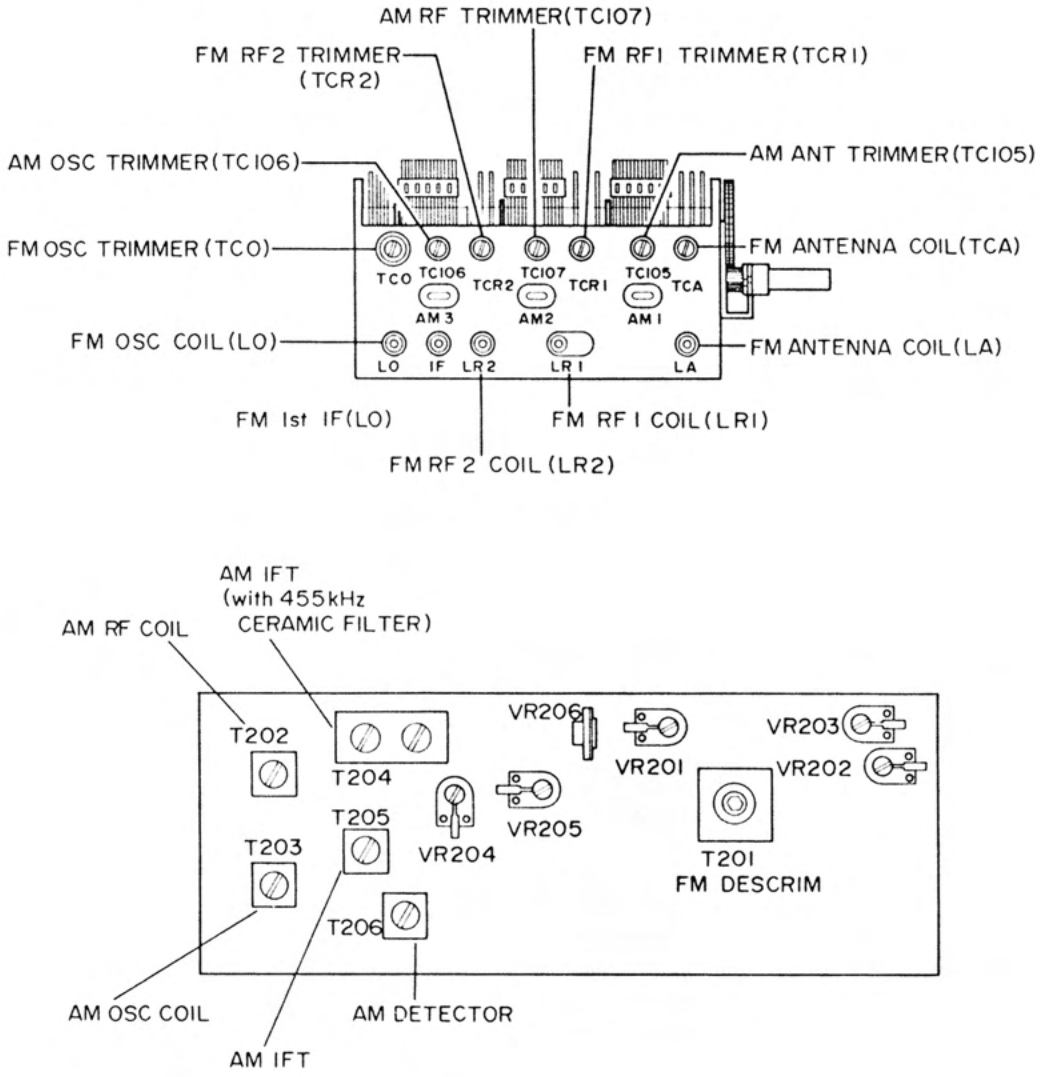


Figure 27

AM IF & RF ALIGNMENT

EQUIPMENT REQUIRED

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

Note: *Signal generator output should be no higher than necessary to obtain an output reading.
*Maintain line voltage at 120 volts, 60 Hz AC.
*Set SELECTOR switch to AM.
*See P.C.B. illustrations for alignment points/adjustments.

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 Fig. 28.	455 kHz (400 Hz, 30 % Mod.)	Point of non-interference (near 600 kHz)	AC Voltmeter to TAPE OUT 1 Jack	T 204 (Both sections) T 205 T 206	Adjust for maximum reading on meter.
2	Same as above	455 kHz (400 Hz, 80 % Mod.)	Same as above	Distortion Meter and AC Voltmeter to TAPE OUT 1 Jack	T 206	Adjust for minimum Distortion.
3	Same as above	600 kHz (400 Hz, 30 % Mod.)	600 kHz	Same as STEP 1	T 203 (AM OSC Coil) L 101 (AM ANT Coil) T 202 (AM RF Coil)	Adjust for maximum reading on meter. Refer to Fig. 28.
4	Same as above	1400 kHz (400 Hz, 30 % Mod.)	1400 kHz	Same as STEP 1	TC 106 (AM OSC Trimmer) TC 105 (AM ANT Trimmer) TC 107 (AM RF Trimmer)	Adjust for maximum reading on meter. Refer to Fig. 27 and 28.
5	Repeat STEPs 3 and 4 until no further change is noticed.					
6	Same as STEP 1	No Signal	Point of non-interference and no signal	AM strength Meter (TUNING Meter on Receiver	VR 206	Adjust so the Meter Pointer on Receiver is at "0" point on the Meter.
7	Same as STEP 1	1000 kHz (400 kHz, 30 % Mod.) Output level to 100 mV/m	1000 kHz	Same as above	VR 204	Adjust so the Meter Pointer on Receiver is between 85 % and 90 % on the Meter.
8	Same as STEP 1	1000 kHz (Modulated 30 % with 2 kHz) Output level to 2 mV/m	1000 kHz	Same as STEP 1	VR 205	Adjust so Output level increases by 3 dB (AM "side band" circuit is "ON").

AM ALIGNMENT SET-UP

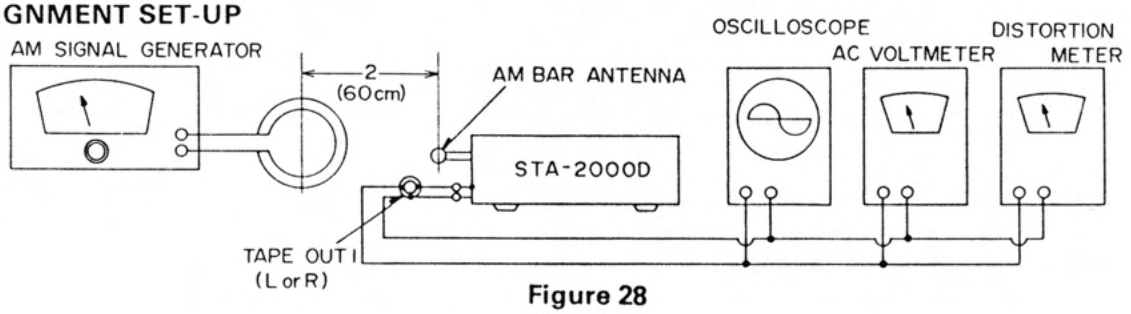


Figure 28

FM RF & IF ALIGNMENT

EQUIPMENT REQUIRED

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

NOTE:
*Signal Generator output should be no higher than necessary to obtain an output reading.
*Maintain line voltage at 120 volts 60 Hz AC.
*Set SELECTOR Switch to FM.
*Refer to P.C.B. illustrations for test points/adjustments.
*DOLBY FM Switch to "OFF" position.

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:no input (unit off)	Near to 98 MHz	TUNING Meter	T 201 (Primary)	Adjust for Center Point on TUNING Meter. Refer to Fig. 29, 30 and 31.
2	Same as above	98 MHz (400 Hz, 75 kHz dev.) Input: 1 mV	Same as above	AC Voltmeter Scope and Distortion Meter to TAPE OUT 1 Jack (L or R)	T 201 (Secondary)	Adjust for minimum Distortion (about 0.1 %). Refer to Fig. 29, 30 and 31.
3	Repeat STEPs (1) and (2) until no further improvement is noticed.					
4	Same as STEP (1)	90 MHz (400 Hz, 75 kHz dev.) Input: about 2 – 3 μV	90 MHz	Same as STEP (2)	LO (FM OSC Coil) LR 1, LR 2 (FM 1st and 2nd RF Coil) LA (FM Antenna Coil)	Adjust for maximum reading on meter. Refer to Fig. 27 and 31.
5	Same as STEP (1)	106 MHz (400 Hz, 75 kHz dev.) Input: about 2 – 3 μV	106 MHz	Same as STEP (2)	TCO (FM OSC Trimmer) TCR 1, TCR 2 (FM 1st and 2nd RF Trimmer) TCA (FM Antenna Trimmer)	Adjust for maximum reading on meter. Refer to Fig. 27 and 31.
6	Repeat STEPs (4) and (5) until no further improvement is noticed.					
7	Same as STEP (1)	98 MHz (400 Hz, 75 kHz dev.) Input: 10 μV	98 MHz	Same as STEP (2)	IFT (FM 1st IFT) (FM Front-end Board)	Adjust for maximum reading on meter. Refer to Fig. 27 and 31.
8	Repeat STEP (7) until no further improvement is obtained. Go back and check STEPs (1) and (2) and realign if necessary.					
9	Same as STEP (1)	98 MHz (400 Hz, 75 kHz dev.) Input: 2.5 μV	98 MHz	Same as STEP (2)	VR 201	"MUTE" switched "ON" and adjust VR 201 for no signal output.

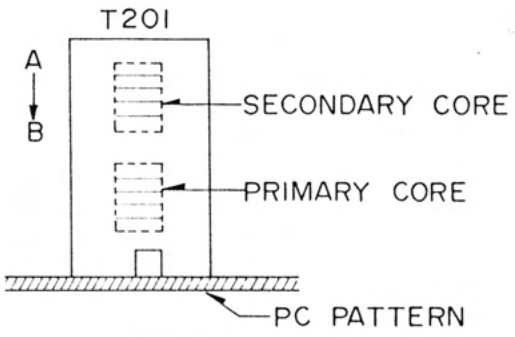


Figure 29

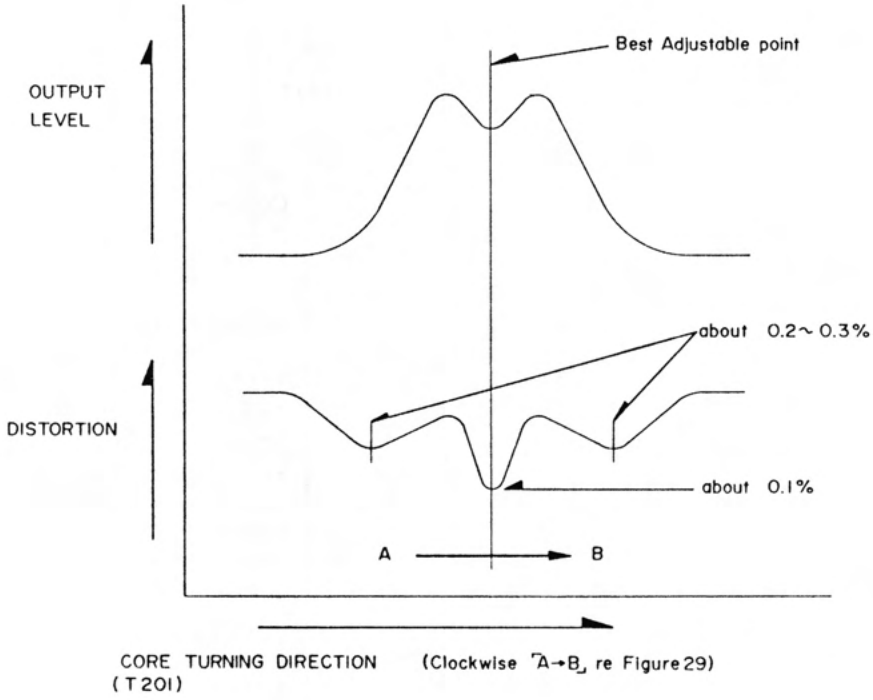


Figure 30

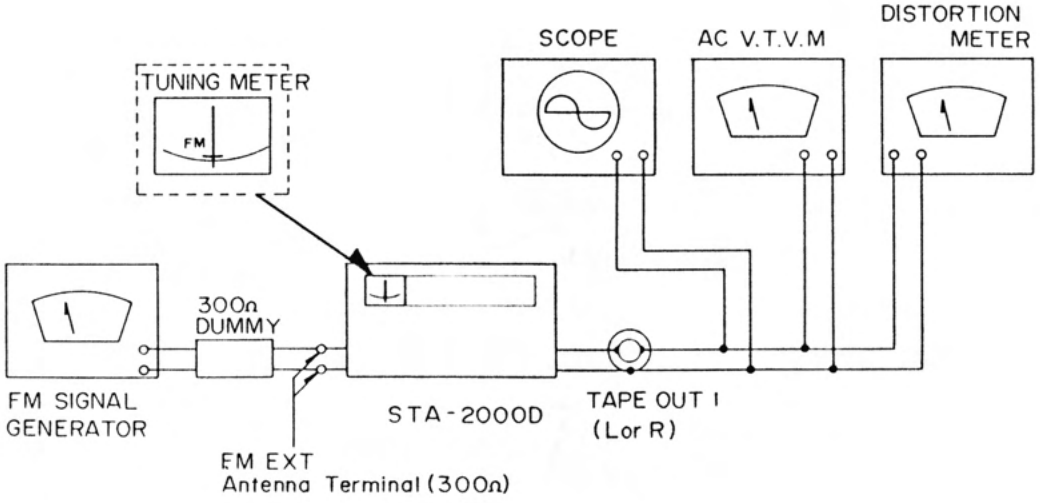


Figure 31

FM STEREO ALIGNMENT

EQUIPMENT REQUIRED

1. Stereo Modulation ---- Connect Stereo Modulator to EXT. Mod. terminal FM Signal Generator
   Modulation Level of 19 kHz Pilot Signal --- 8 % (6 kHz dev.)
2. FM Signal Generator ---- Output Level ---- 1 mV
   Frequency ---- Approximately 98 MHz
   Deviation ---- 67.5 KHz, 90% 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 MODE switch to 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 IC 202	VR203	Adjust for 19 kHz ±50 Hz on Counter. Refer to Fig. 32.
2	Same as above	Composite MPX Signal 1 kHz on Left channel ONLY	AC Voltmeter connector for TAPE OUT 1 Jack of Right Channel	VR 202 (Separation)	Adjust for minimum reading on meter. Refer to Fig. 33.
3	Same as above	Composite MPX Signal 1 kHz on Right channel ONLY	AC Volmeter connector for TAPE OUT 1 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 re same channel output (ie. 40 dB separation).				
5	Same as STEP (1)	Composite MPX Signal 1 kHz	AC Voltmeter connected to TAPE OUT 1 Jack	----	With 2.5 μV antenna input signal, Stereo indicator lamp should come on.
6	Same as STEP (1)	Composite MPX signal 1 kHz	Distortion Meter connected to TAPE OUT 1 jack.	----	With 1 mV antenna input signal, STEREO Distortion should be under 0.3 %.

FM STEREO ALIGNMENT SET-UP

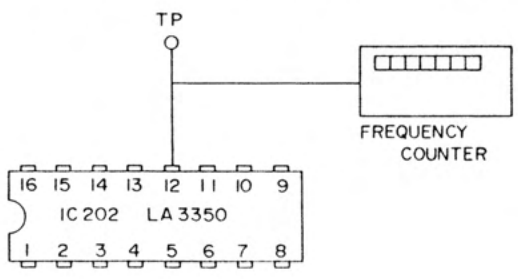


Figure 32

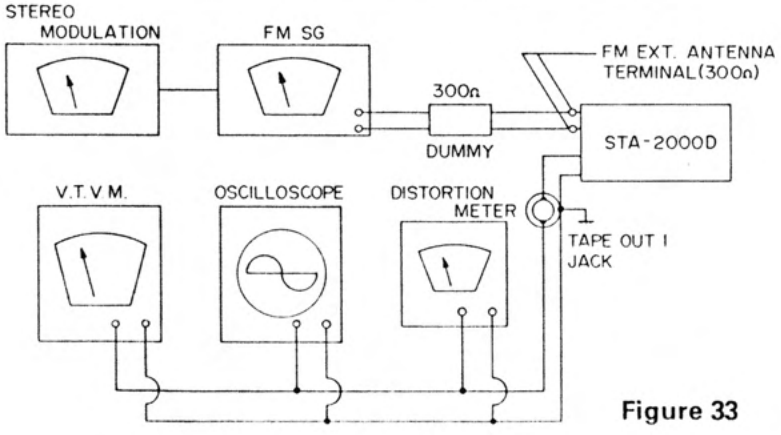


Figure 33

DOLBY FM ALIGNMENT

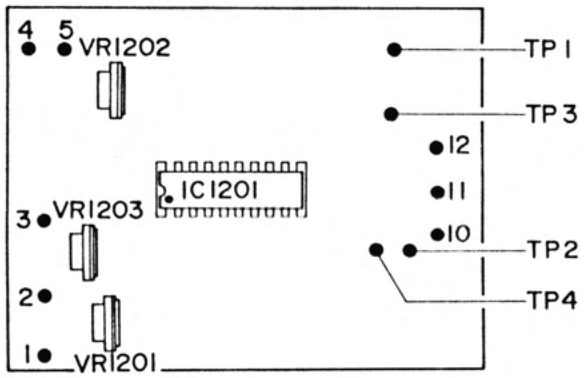


Figure 34

EQUIPMENT REQUIRED

1. Stereo Modulation ---- Connect STEREO MODULATOR to Ext. Mod. terminal
   FM signal Generator
   Modulation level of 19 kHz Pilot Signal ---- 9 % (6.75 dev.)
   Main level (L + R) ---- 50 % (37.5 kHz dev.)
2. FM Signal Generator --
   Frequency ---- Approximately 98 MHz
   Deviation ---- 44.25 kHz, 59 % modulation of composite signal
   Modulation Frequency ---- 400 Hz
3. Audio Generator
4. AC Voltmeter
5. Oscilloscope

Note. *See P.C.B. illustrations for alignment/test points.
*Set SELECTOR Switch to FM, MODE Switch to STEREO and MUTE Switch to "OFF" positions.

DOLBY LEVEL ADJUSTMENT

STEP	SIGNAL GENERATOR COUPLING	STEREO MODULATION	INDICATOR	ADJUSMTNET	REMARKS
1	Connect to FM antenna terminal thru FM dummy antenna	Composite signal 400 Hz. Input: 1 mV	AC Volt-meter connected to TP 4 (L ch) or TP 3 (R ch).	VR1201 (L ch) VR1202 (R ch)	With DOLBY FM Switch in "off" position, adjust output level to 0.775 V. Refer to Figures 34 and 35.

DOLBY LAW ALIGNMENT

*Note: Before this Alignment, disconnect Pins 2 and 3 on DOLBY FM Board from set.

STEP	ADJUSTMENT	EQUIPMENT	CONNECTION	AUDIO FREQUENCY	LEVEL	ADJUSTMENT
1		Audio Osc. V.T.V.M. Oscilloscope	See Figure 36.	400 Hz	Adjust input level to get output level of 0.775 volts. Set DOLBY FM Switch to "off".	— — — —
2		Same as above	Same as above	5 kHz	Adjust input level to get output level of 59 mV. Set DOLBY FM Switch to "off".	— — — —
3	LAW adjustment	Same as above	Same as above	5 kHz	After setting the level as per STEPs 1 and 2, set DOLBY FM Switch to "on". Adjust VR1203 toget to output level of 23.5 mV (Compare with DOLBY FM Switch "off"; level difference should be 8 dB).	VR 1203
4	After STEPs 2 and 3, check the balance of left and right levels.					

Reconnect Pins 2 and 3 of DOLBY FM Board.

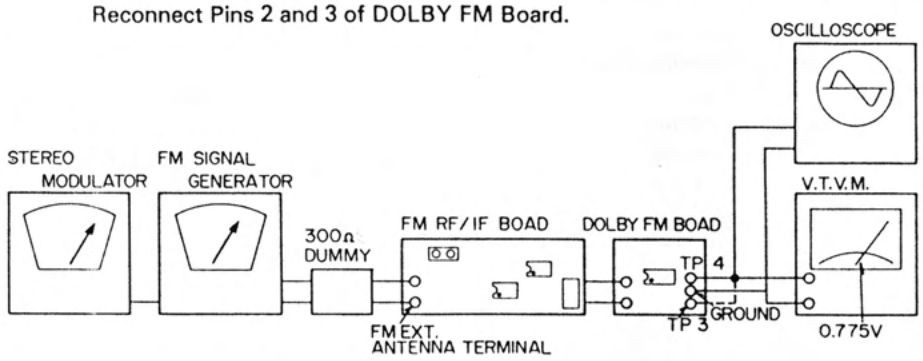


Figure 35

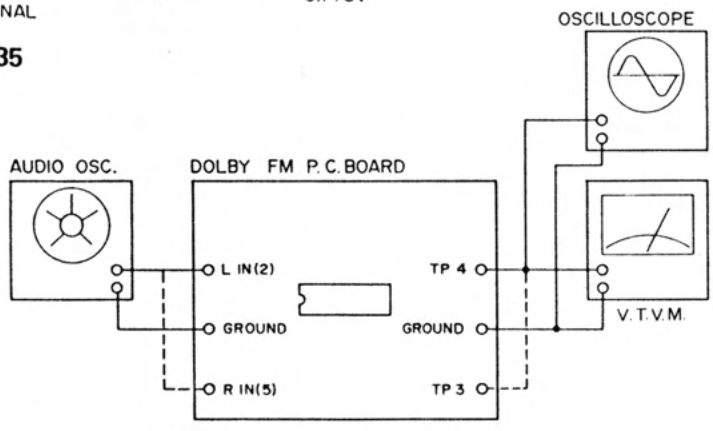


Figure 36

(7) BRIEF DESCRIPTION OF PROTECTOR CIRCUITS

(A) SPEAKER PROTECTIVE CIRCUIT

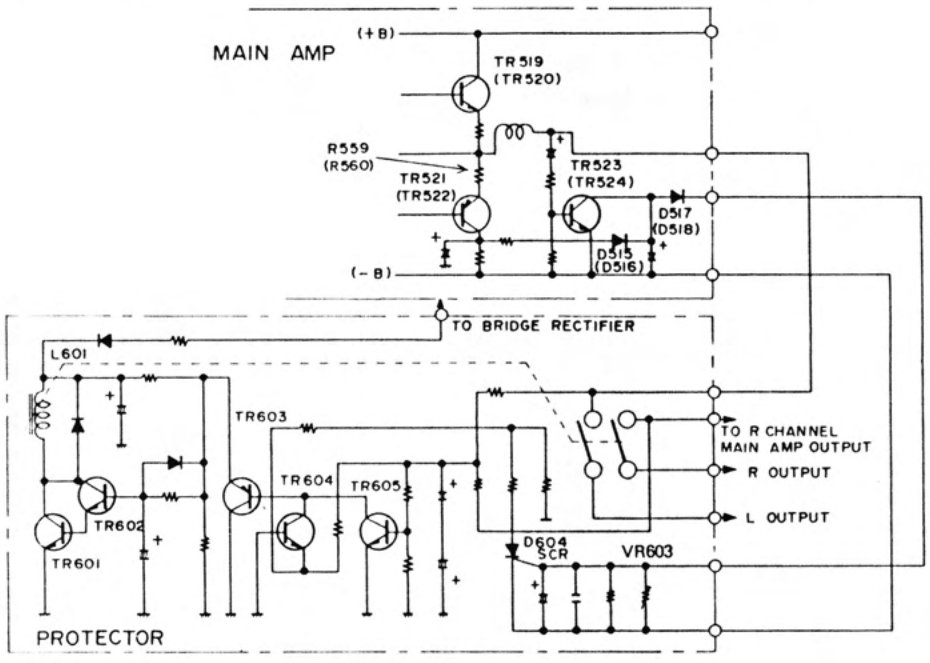
When you Switch Power "ON", a three second signal delay is provided to the speaker output terminals by Relay L 601. This is to protect your Speakers from switching transients.
This circuit is made up of Time Constant circuit R 603 and C 602.

(B) MAIN AMP PROTECTIVE CIRCUIT

If center voltage of MAIN Amp goes to ±5 V (Natural condition: ±20 mV), TR 604 and TR 605 will be turned on, and thus TR 602 and TR 601 will be turned off. If this should occur, Relay L 601 will shut off output to the Speaker terminals and output will drop to zero and thus protect MAIN Amp and Speakers.

(C) PROTECTIVE CIRCUIT IN CASE OF SHORTED OUTPUT TERMINALS

If speaker terminals are shorted (or Load impedance of one channel (Left or Right) is less than 4 ohms), excessively high current flows from Emitter to Collector of TR 521 (or TR 522) and a high voltage appears across R 559 (or R 560).
This high voltage goes to Gate of SCR D 604 after being rectified by D 515 (or D 516) and D 517 (or D 518).
When the voltage between Cathode and Gate increases to about 0.7 V, SCR D 604 will be turned on.
Voltage at Base-Emitter of TR 604 goes to about 0.7 V, MAIN Amp + B voltage will be down and thus protect Power Transistor TR 519, 520, 521 and 522.
If this should occur, the Amplifier will automatically shut down and output will drop to zero.
Turn the Receiver off to reset the protective circuit. Wait approx. 30 seconds.
When the problem is corrected, turn the Receiver on again.



(D) ABNORMAL TEMPERATURE RISE PROTECTION

If the temperature of the MAIN Amp Heat Sink rises to 95°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.

(E) FM NOISE AND SWITCHING/MUTING CIRCUIT

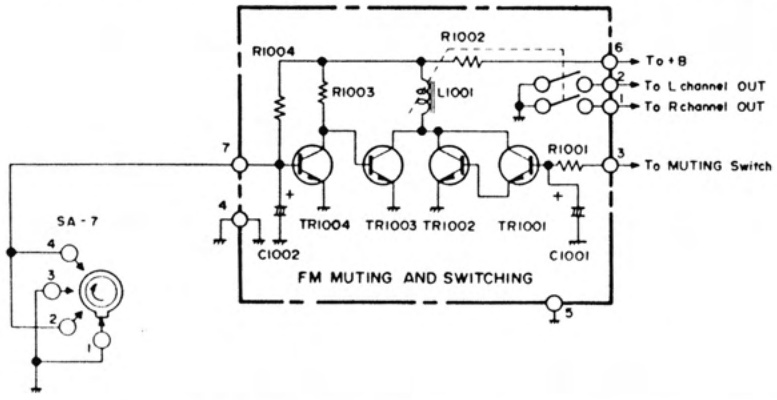
This circuit performs two functions.

1) To eliminate the interstation hiss-noise sometimes noted just on either side of a station you are tuning in, with FM muting "ON".

When no signal is received, the voltage applied to the base of TR 1001 is 3V and both TR 1001 and TR 1002 are kept on, which activates the relay, L 1001, and output is cut off. When a weak noise signal is received, the voltage drops to around 1.2V and both TR 1001 and TR 1002 remain on, keeping the relay activated and output cut off. When tuned to a station, the voltage drops further (to less than 1V) and TR 1001/2 are turned off and L 1001 is deactivated.

2) To eliminate the clicking noise when function switch is turned from AM to FM (or FM to PHONO, PHONO to AUX 1, etc.).

The switch SA-7 is a shorting type, goes through a short-circuit condition when turning from 1 (AM) to 2 (FM), etc. (it momentarily is grounded). This turns TR 1004 off and TR 1003 on. Thus, L 1001 is activated and output is cut off. The time constant of R 1004 and C 1002 allows the cut off condition to last for about one second (before C 1002 charges up to a point where TR 1004 turns on again, etc.).



(8) DOLBY FM

In conventional FM broadcasting, a signal having the characteristics shown in Figure 37 is transmitted to reduce noise during broadcasting.

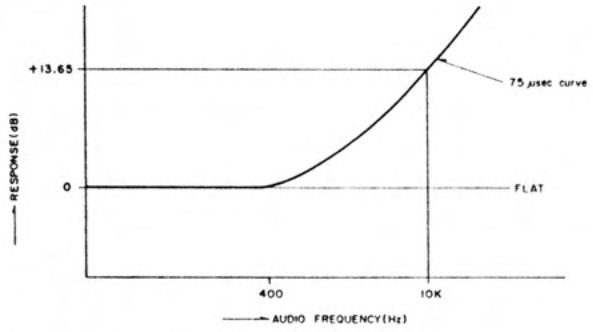
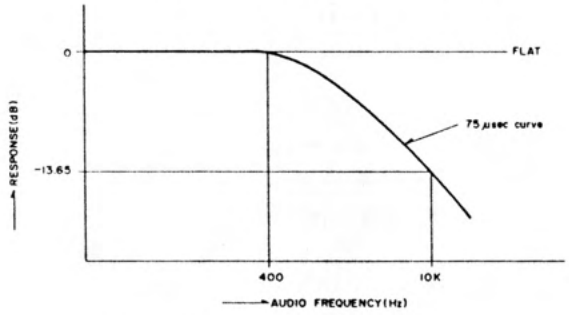


Figure 37 BROADCASTING PRE-EMPHASIS CURVE

Such signals have characteristics of high emphasis by the respective time constants.
This signal is then flattened when recovered by a Receiver having the inverse characteristics shown in Figure 38.

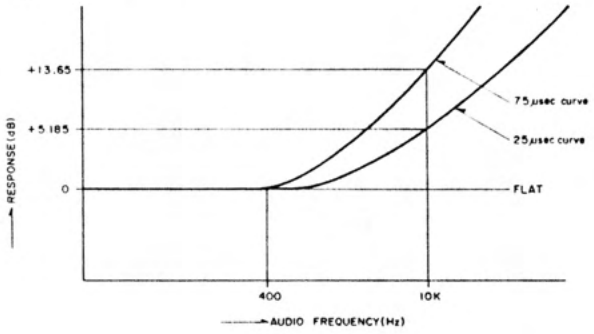


RECEIVER'S DE-EMPHASIS CURVE

Figure 38

Since such a "noise reduction" system becomes easily saturated, etc. The DOLBY FM NOISE REDUCTION System eliminates some of the inherent difficulties of the standard pre-emphasis/ de-emphasis approach.

DOLBY FM does not emphasize at 75 μS but emphasizes at only 25 μS, and transmits it with the DOLBY ENCODE superimposed.



PRE-EMPHASIS CURVE

Figure 39

A signal transmitted with 25 μS pre-emphasis must be recovered through 25 μS de-emphasis circuit.
However, standard Receiver de-emphasis is still 75 μS; so when the 25 μS broadcast is received, the characteristics shown in Figure 40 are obtained.

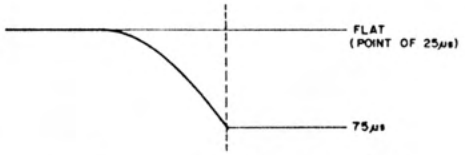


Figure 40

To make the characteristics flat, the signal must be passed through a circuit providing the characteristics shown in Figure 41.

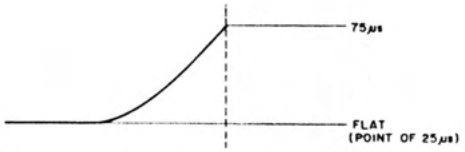
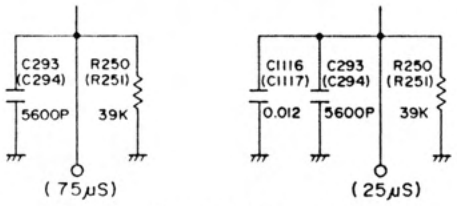


Figure 41

The STA-2000D incorporates a circuit shown in Figure 42.
This Time Constant conversion circuit converts 75 μS → 25 μS.



TIME CONSTANT CONVERSION CIRCUIT

Figure 42

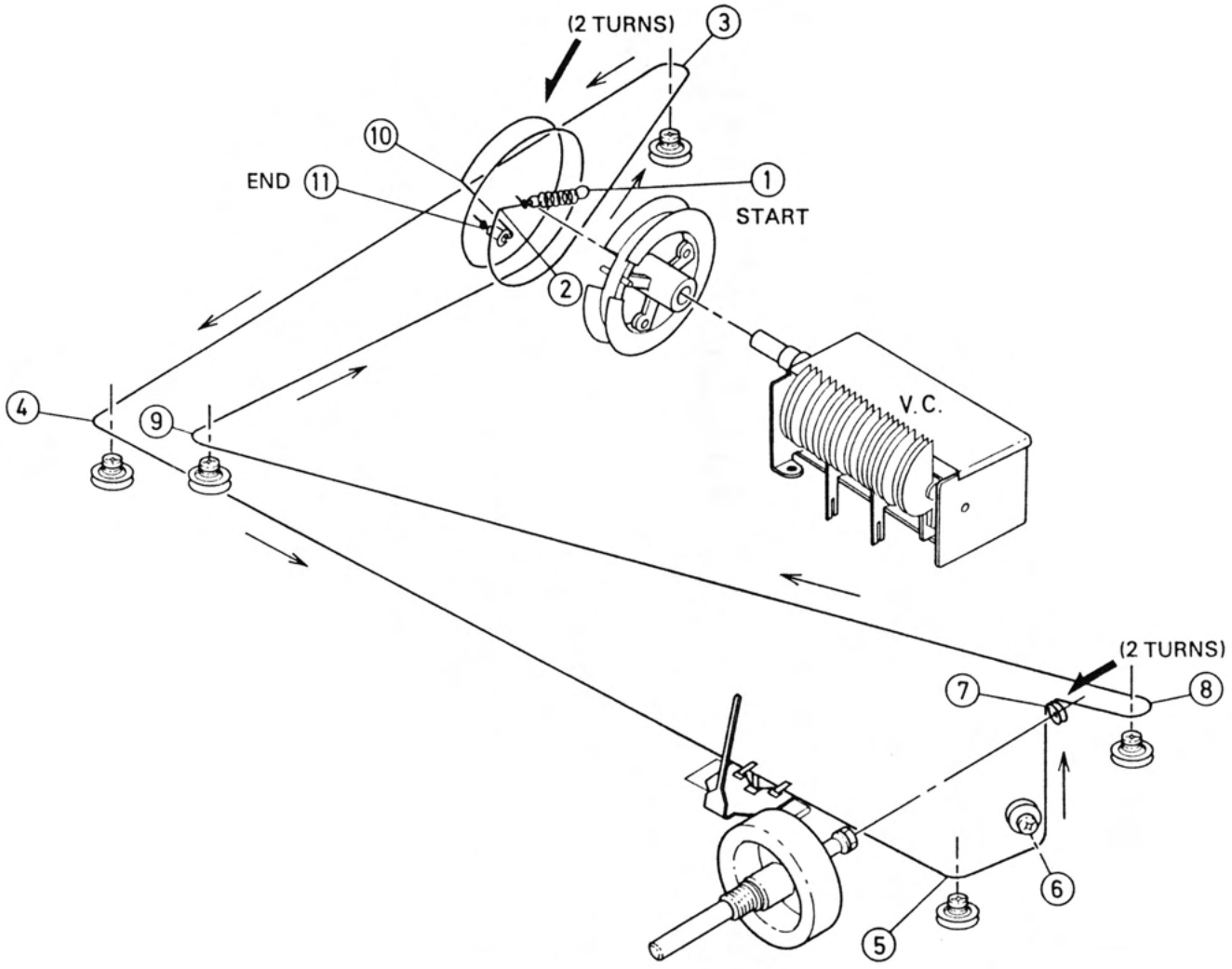
In DOLBY NR, the audio transmission level must be precisely matched in the receiver circuit.

When DOLBY FM Switch is "ON", the STA-2000D has a built-in level control adjustable by the VR1201, 1202 and 1203 on DOLBY FM Board, and these are used to matchs the level of the transmitted signal from a DOLBY FM broadcast station.

The STA-2000D has both 75 μS and 25 μS de-emphasis; with DOLBY FM Switch ("ON" = 25 μS, "OFF" = 75 μS).

When DOLBY FM broadcast signals are received, a flat output is obtained with DOLBY FM switched "ON".

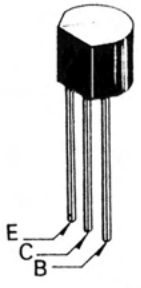
(9) DIAL STRINGING DIAGRAM



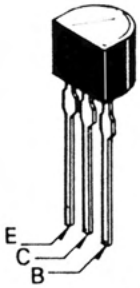
START WITH CAPACITOR SET AT MINIMUM.
(PLATES FULLY OPEN)

POINTER POSITION: HIGH END
START: SPRING
FINISH: HOOK

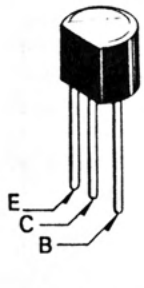
(10) IC & TRANSISTOR LEAD IDENTIFICATIONS



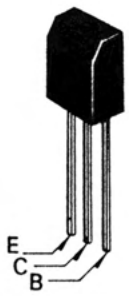
2SC536
2SC929



2SC829

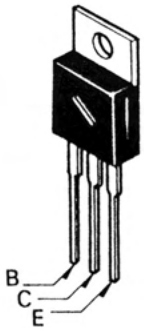


2SC945
2SC1222
2SC1399
2SC1675
2SA733
2SA750

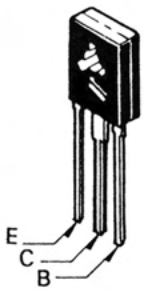


2SD571

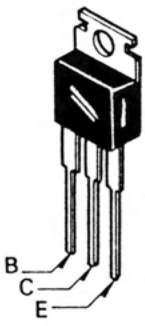
2SD381
2SB536



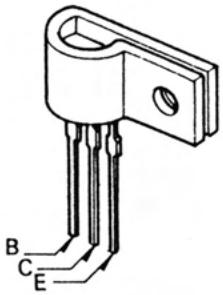
2SC1953



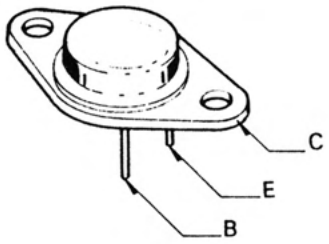
2SB511
2SD325

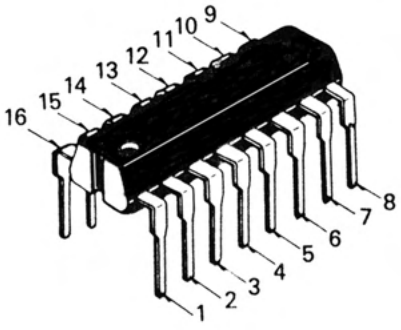


2SD261

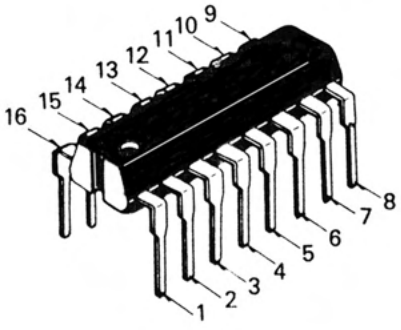


2SB539
2SD287

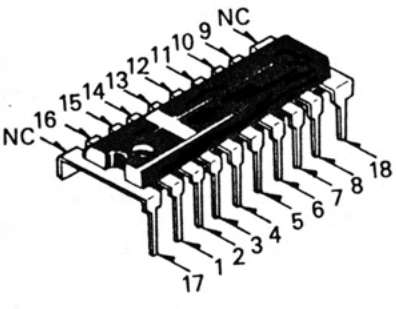




LA-1230



LA-3350



HA-11226

(11) 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 Fuse *Replace the Fuse. 5) Defective D1101 or diodes/ transistors on Power Supply board *Replace the defective part(s).
2) Pilot Lamp does not Light for SELECTOR (AM, FM, PHONO, AUX-1 or AUX-2).	1) Broken Lamp *Replace the Lamp. 2) Open in the Power Transformer tertiary winding *Replace the Transformer. 3) Defective diode D708 *Replace.
3) Pilot lamp lights but no Speaker output.	1) Defective capacitor C 1106 or C 1107 *Replace the defective capacitor(s). 2) Defective Rectifier D 1101 *Replace the defective Rectifier. 3) Defect in the Power Transformer secondary winding *Replace the Power Transformer. 4) Defective Power Relay L 601 *Replace the Relay.
4) Blows Fuse.	1) Defective Rectifier D 1101 *Replace the Rectifier. 2) Short-circuit in the rectifier circuit *Remove the short. 3) Short-circuit in Power Transistor Circuitry TR 519-522 *Repair circuit and/or replace the defective Transistor. 4) Defective Relay or Transistors on Protector board *Replace the part(s).
5) "A" Speakers do not work.	1) Speaker switch A defective *Replace the switch.
6) "B" Speakers do not work.	1) Speaker switch B defective *Replace the switch.
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 VR 405/406.	1) Defective Transistor TR 401-412, TR 501-524 or TR 601-605 *Replace the defective Transistor(s). 2) Defective resistor or capacitor of TONE, MAIN AMP or PROTECTOR circuit *Replace the defective part(s).

SYMPTOM	CAUSE/REMEDY
8) No output when a test signal is applied to the input terminals except PHONO input.	1) Defective MONO-Stereo or TAPE switch *Replace or repair 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 AMP circuit *Replace the part(s). 2) Defective MONO-Stereo or TAPE switch *Replace or repair the switch. 3) Defective Selector switch *Replace the Selector switch.
10) No output when a test signal is applied to the desired input.	1) Defective transistors or diodes on Power Supply board *Replace the defective part(s). 2) Defective transistor, resistor or capacitor on Tone Control board *Replace the defective part(s). 3) Defective transistor, capacitor or resistor on Main Amp. board *Replace the defective part(s).
11) DC not balanced within ±20mV at output of L/R channel.	1) Defective TR501 or 503 (TR 502 or 504) *Replace the defective transistor(s). 2) Improper value for VR501 or 502 *Replace or readjust the VR501 or 502. 3) Defective zener diode D501 or 502 *Replace the defective diode(s).
12) Speaker works normally but Headphone does not work.	1) Defective R 629 (Left) or R 628 (Right) *Change it. 2) Headphone plug does not mate with jack *Replace the plug.
13) All the inputs work normally except "AUX-1" input.	1) Poor contact in "AUX-1" input jack *Repair or replace it. 2) Poor contact in Selector switch *Repair or replace the switch.
14) All the inputs work normally except "AUX-2" input.	1) Poor contact in "AUX-2" input jack *Repair or replace it. 2) Poor contact in Selector switch *Repair or replace the switch.
15) "PHONO" input not operative	1) Poor contact in "PHONO" input jack *Repair or replace it. 2) Faulty Selector switch *Repair or replace it.
16) "TAPE OUT 1" inoperative	1) Poor contact in "TAPE OUT 1" output jack *Repair or replace the jack.
17) "TAPE IN 1" inoperative	1) Poor contact in "TAPE IN 1" input jack *Repair or replace the jack.

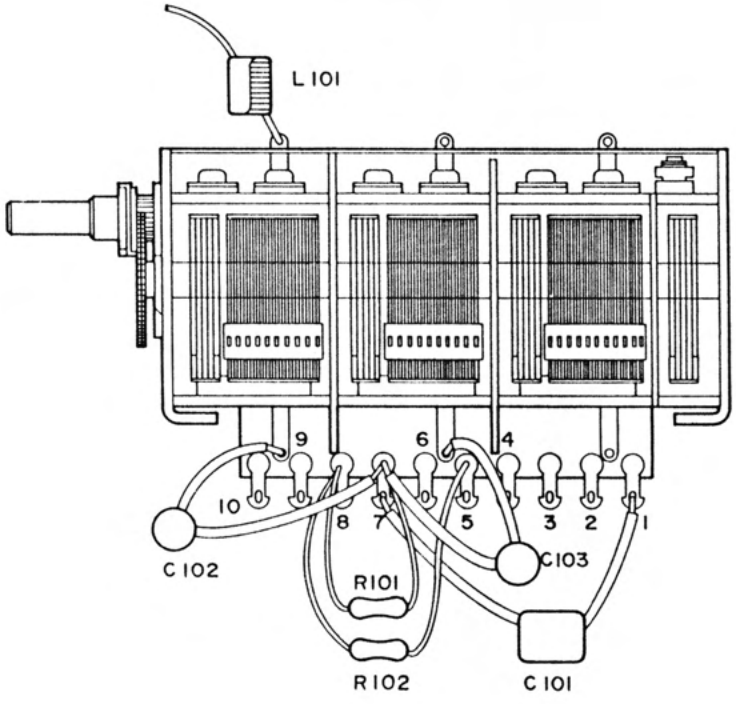
SYMPTOM	CAUSE/REMEDY
18) "TAPE OUT 2" inoperative	1) Poor contact in "TAPE OUT 2" output jack *Repair or replace the jack.
19) "TAPE IN 2" inoperative	1) Poor contact in "TAPE IN 2" input jack *Repair or replace the jack.
20) No AM or FM. (Tuner + B voltage is not 11-12 V.)	1) Broken tertiary winding in the Power Transformer *Replace the Transformer. 2) Defective Diode D 705 or D 706 *Change the defective Diode(s). 3) Faulty capacitor C 705, 706, 717, 718, 719, 720 or 724 *Change the defective capacitor(s). 4) Defective resistor R 713 or 714 *Replace the resistor(s). 5) Zener Diode D 707 defective *Replace the Diode. 6) Short-circuit in Tuner + B circuit *Repair the short. 7) Poor contact in Selector switch *Repair or replace it. 8) Defective Transistor TR 701 *Replace the Transistor.
21) No FM	1) Poor contact in Selector switch *Repair or replace it. 2) IC, Transistor, Diode, resistor, capacitor, Inductor or IFT of FM board defective *Replace the defective part(s). 3) FM Front End defective *Replace the Front End (This board comes assembled). 4) Faulty FM Antenna lead-in/circuitry *Replace or repair the Antenna lead-in/circuitry.
22) No AM	1) Poor contact in Selector switch *Repair or replace switch. 2) Transistor, Diode, IFT, resistor or capacitor of AM IF defective *Replace the defective part(s). 3) Bar-Antenna coil defective *Repair or replace it.
23) Poor FM sensitivity.	1) Defective TR201 or 202 *Replace the defective transistor(s). 2) Defective IC IC201 *Replace the defective IC. 3) Defective ceramic filter CF201, 202 or 203 *Defective ceramic filter(s). 4) Defective T201 *Replace the defective detector coil.

SYMPTOM	CAUSE/REMEDY
24) Excessive FM distortion.	1) Defective T201 *Replace the defective detector coil. 2) Defective ceramic filter CF201, 202 or 203 *Replace the defective filter(s). 3) Defective IC IC201 *Replace the defective IC. 4) Defective transistor TR201 or 202 *Replace the defective transistor(s).
25) Poor AM sensitivity.	1) Defective L1101, T202-206 *Replace the defective part(s). 2) Defective TR208-211 or 213 *Replace the defective transistor(s).
26) No FM MPX Separation	1) Improper adjustment *Readjust VR 202 and VR 203. 2) IC 202 or MPX board defective *Replace the IC. 3) VR 202, 203(Trimmer resistor) defective *Replace the Trimmer resistor. 4) Defective Transistor TR204, 205, 206 or 207 *Replace the defective Transistor.
27) No STEREO light or FM Stereo does not works.	1) Broken STEREO indicator lamp *Replace the lamp. 2) Defective IC 202 of MPX board *Change the defective IC. 3) Defective Transistor TR 204, 205, 206 and 207 *Replace the defective Transistor(s). 4) VR 202, 203 defective *Replace the defective Trimmer resistor(s).
28) AM Wide Band has no effect (High Frequency, higher than 3 kHz will be increased when signal input is more than about 2 mV/m but this effect does not work).	1) Defective Transistor TR 214, 215 or 216 *Replace the defective transistor(s). 2) Defective capacitor C 282-287 *Replace the defective capacitor(s). 3) Defective resistor R294-297 *Replace the defective resistor(s). 4) Defective Diode D205 or 206 *Replace the defective Diode(s).
29) "LOUDNESS" has no effect.	1) Defective "LOUDNESS" switch *Replace the switch. 2) Defective C 449, 450, R 475-478, R 1114 or 1115 *Replace the defective part(s).

SYMPTOM	CAUSE/REMEDY
30) "Stereo-MONO" not effective	1) Defective Stereo-MONO "MODE" switch *Repair or replace the switch.
31) "MUTING" not effective	1) Defective MUTE switch *Repair or replace the switch. 2) Defective Transistor TR 203 or TR 1001-1004 *Replace the defective Transistor(s). 3) Defective Trimmer resistor VR 201 *Replace the Trimmer resistor. 4) Defective the part(s) of MUTING board *Replace the part(s).
32) "HI MPX FILTER" not effective	1) Defective HI MPX FILTER switch. *Repair or replace the switch. 2) Defective C 247 or R 253 *Replace the defective part(s).
33) "TAPE DUBBING 1—2" does not operate.	1) Defective TAPE DUBBING switch *Replace it.
34) "TAPE DUBBING 2—1" does not operate.	1) Defective TAPE DUBBING switch *Replace it.
35) "TAPE MONITOR 1" does not operate.	1) Defective TAPE MONITOR switch *Replace it.
36) "TAPE MONITOR 2" does not opeate.	1) Defective TAPE MONITOR switch *Replace it.
37) "BASS" has not effect	1) VR 403, 404 (100 K ohm control) defective *Replace it. 2) Defective R 445-448, 451-456 or C 425-428 of TONE CONTROL board. *Replace the defective part(s).
38) "TREBLE" has no effect.	1) Faulty VR 401 or VR 402 (100 K ohm control) *Replace it. 2) Defective R 441-444, 450, 451 or C423, 424 of TONE CONTROL board *Replace the defective part(s).
39) WATTS Meter does not work.	1) Defective WATT Meter L or/and R *Repair or replace the Meter. 2) Defective Diode, capacitor or resistor of Meter circuit *Replace the defective part(s). 3) Defective Trimmer resistor VR 601, 602, VR 604 or 605 *Replace the defective Trimmer resistor.
40) PROTECTOR circuit does not work.	1) Defective SCR D 604 *Replace the defective SCR. 2) Defective resistor or capacitor of PROTECTOR circuit *Replace the defective part(s). 3) Defective Diode D 601, 602, or 603 *Replace the defective Diode(s). 4) Defective Transistor TR 601-605 *Replace the defective Transistor(s). 5) Defective Relay L 601 *Replace it.

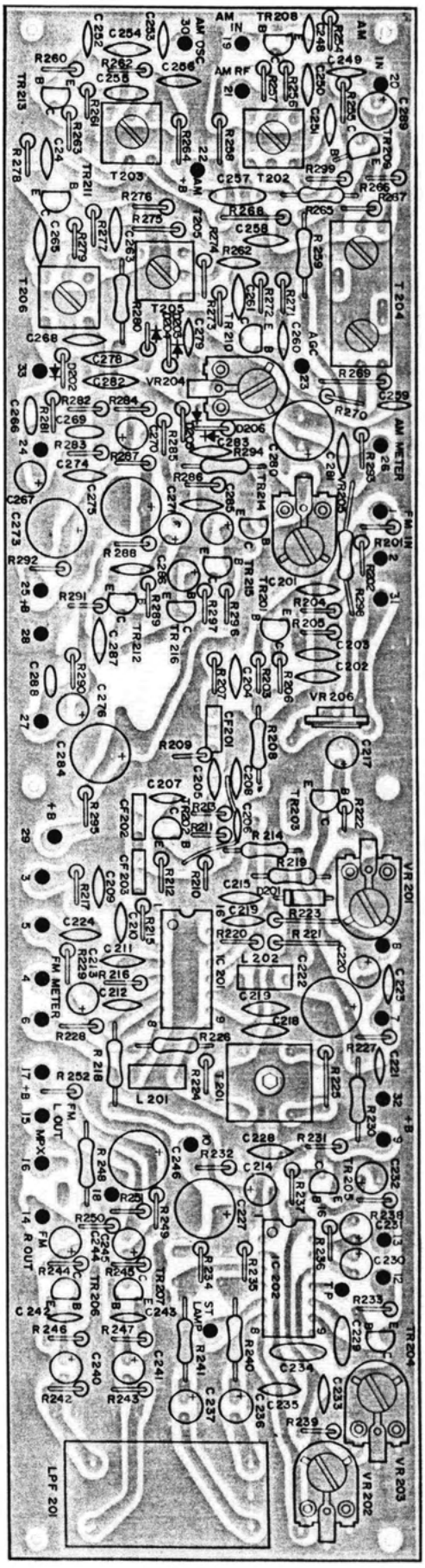
SYMPTOM	CAUSE/REMEDY
41) "TUNING" Meter not functioning	1) Defective TUNING Meter *Replace it. 2) In case of FM reception, R 226 228 or C 213 defective *Replace the defective part(s). 3) In case of AM reception, VR 204, 206, D 203, 204 C 278-281, or R 293, 298 defective *Replace the defective part(s).
42) Dolby FM NR has no effect.	1) Defective IC IC1201 *Replace the defective IC. 2) Defective diode, resistor or capacitor on Dolby FM board *Replace the defective part(s).
43) With Dolby FM "in", frequency response is not correct.	1) Defective C1116 or 1117 *Replace the defective capacitor(s). 2) Defective IC IC1201 *Replace the defective IC. 3) Defective diode, resistor or capacitor on Dolby FM board *Replace the defective part(s).

(12) FRONT END ASSEMBLY

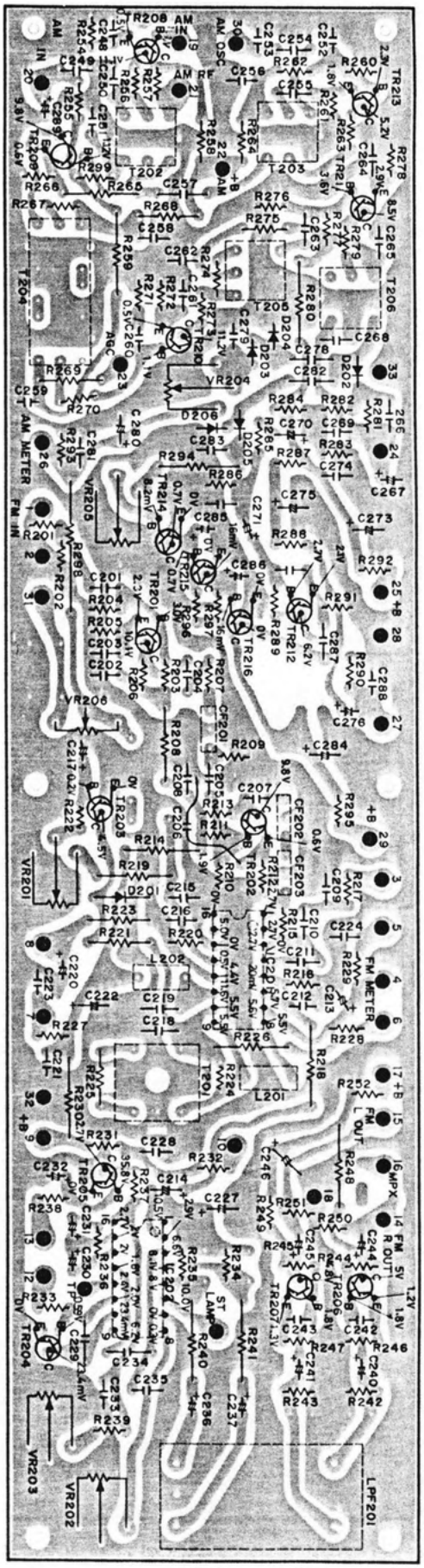


(13) AM/FM IF & MPX P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

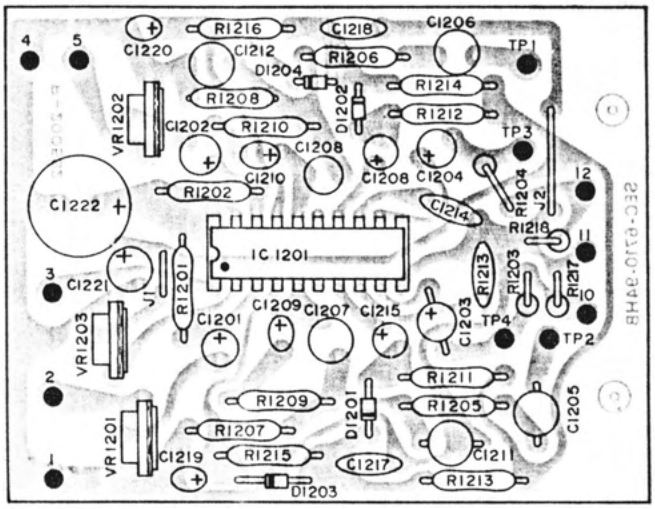


BOTTOM VIEW

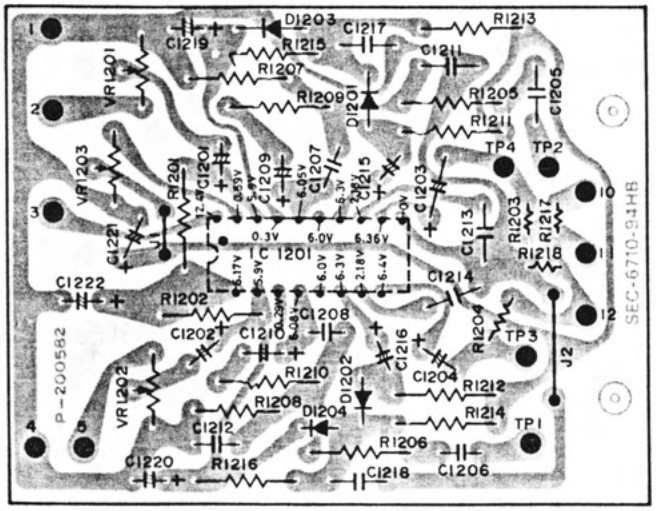


(14) DOBLY FM P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

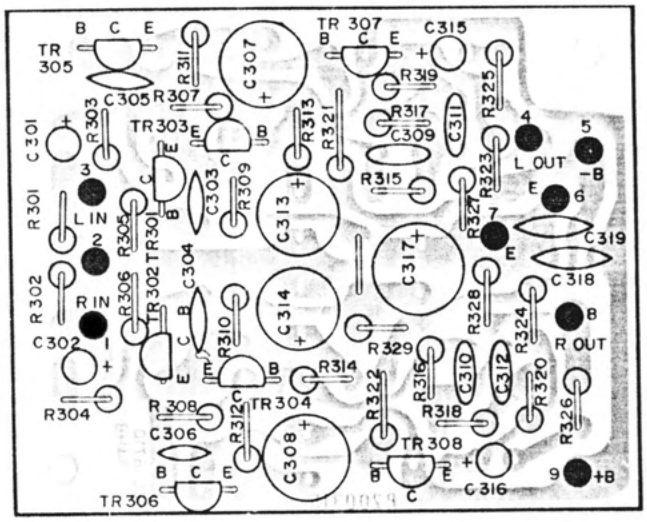


BOTTOM VIEW

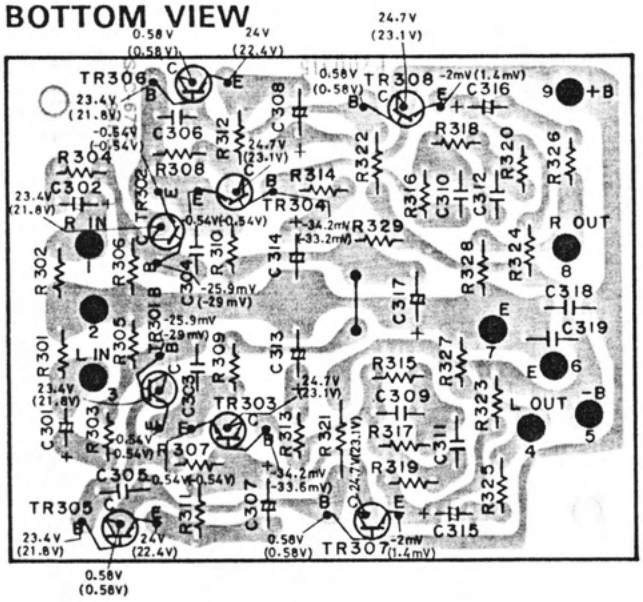


(15) PRE AMP P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

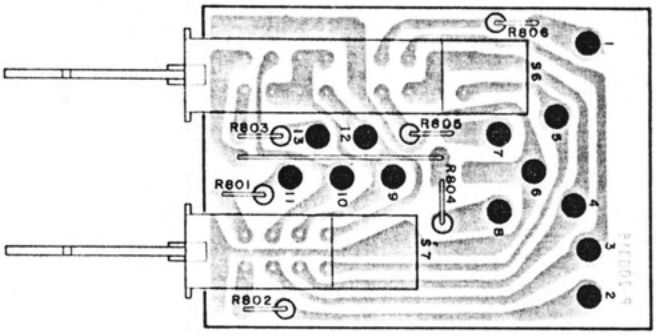


BOTTOM VIEW

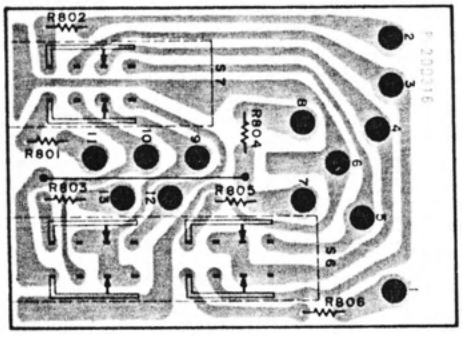


(16) TAPE SWITCH P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

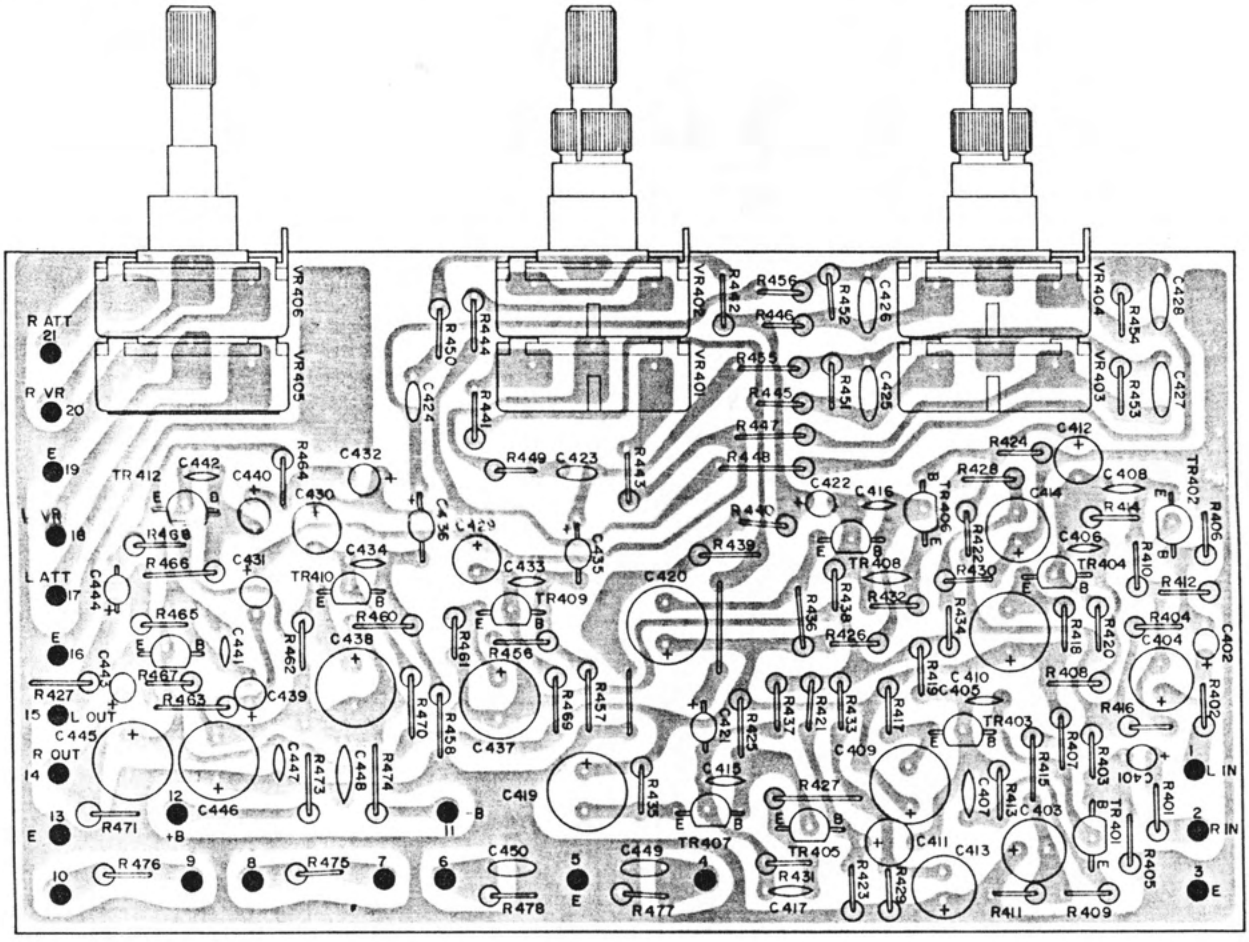


BOTTOM VIEW

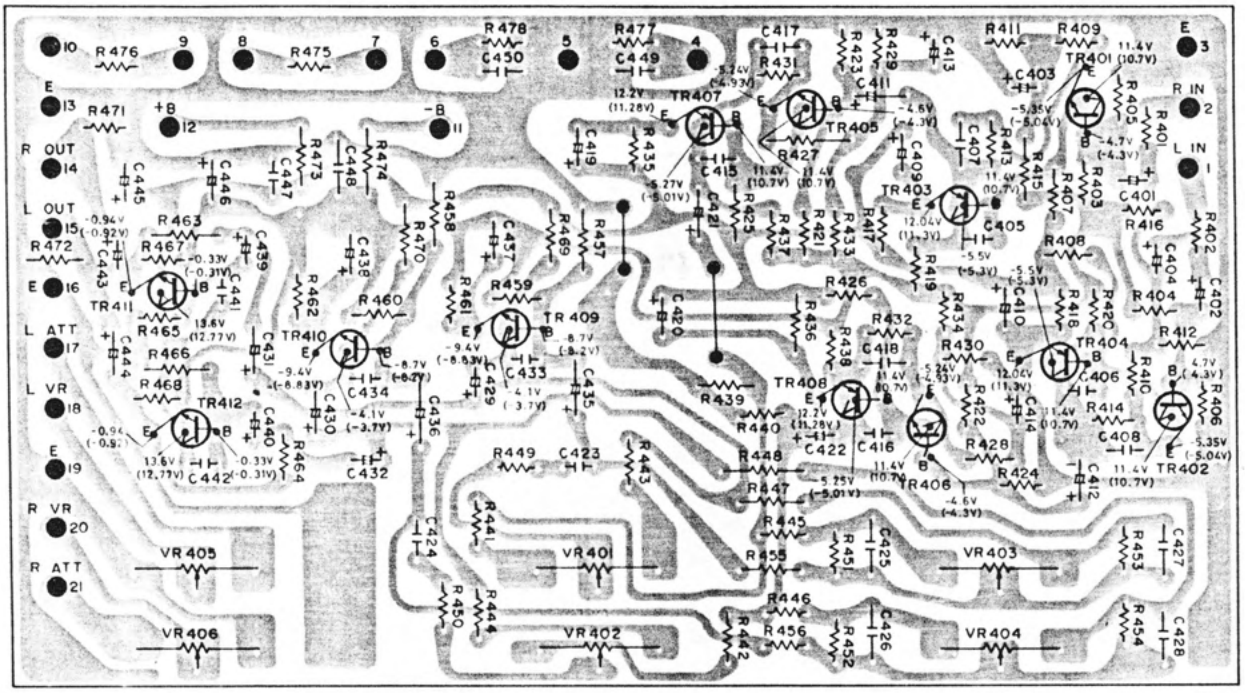


(17) TONE AMP P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

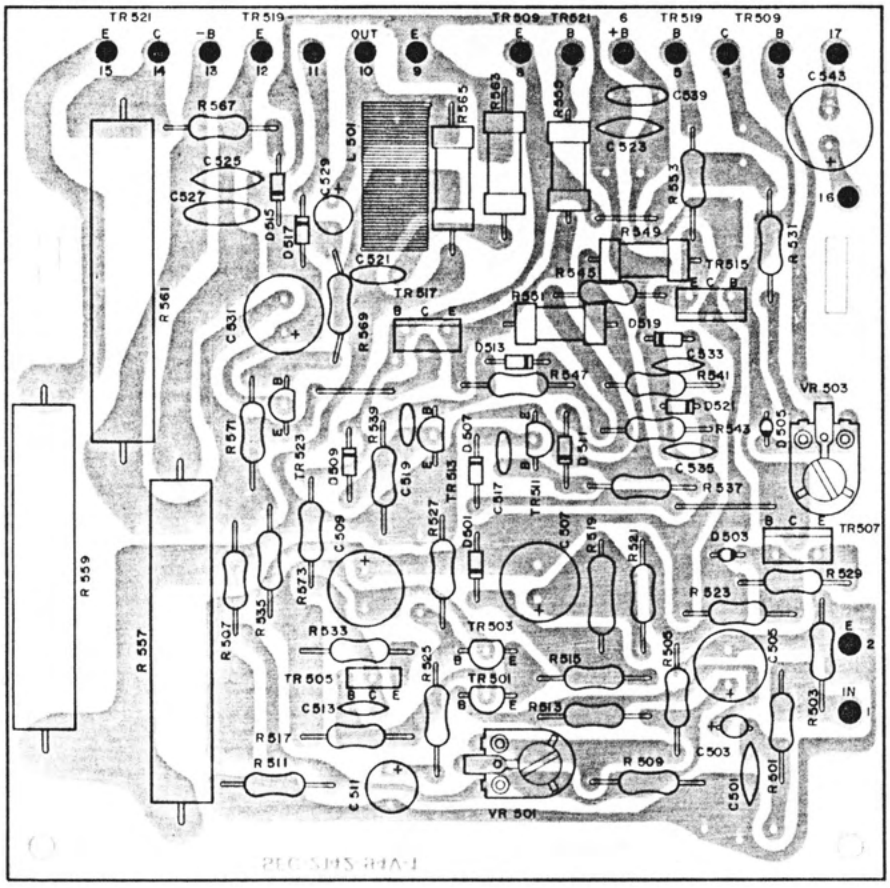


BOTTOM VIEW

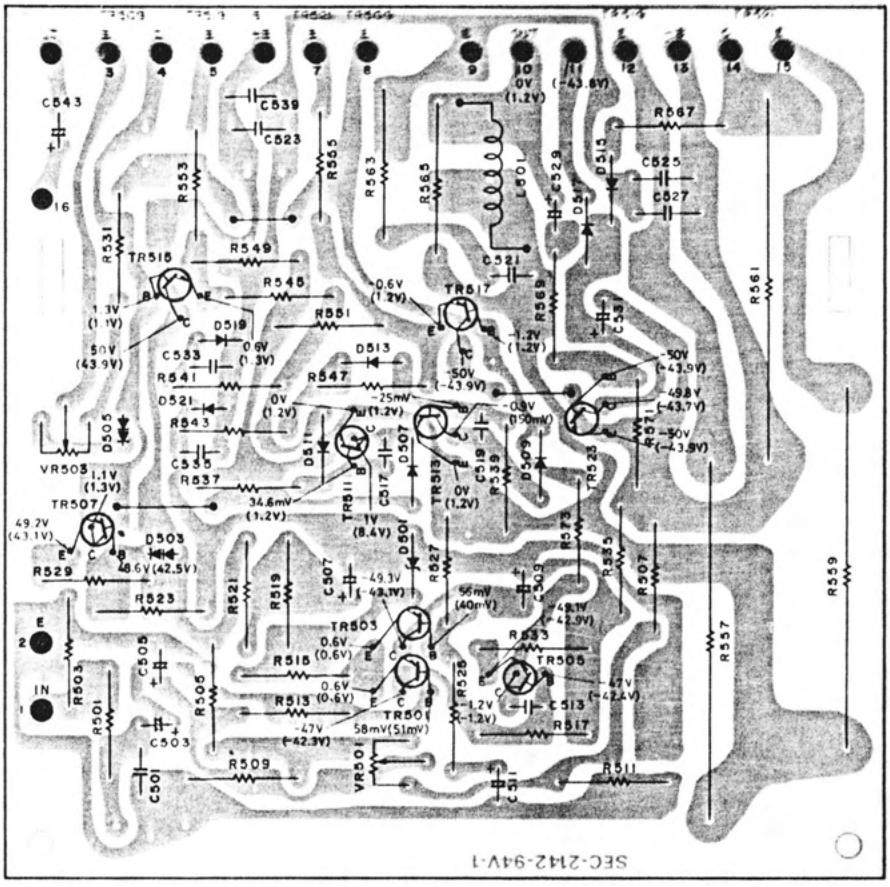


(18) MAIN AMP LEFT P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW



BOTTOM VIEW

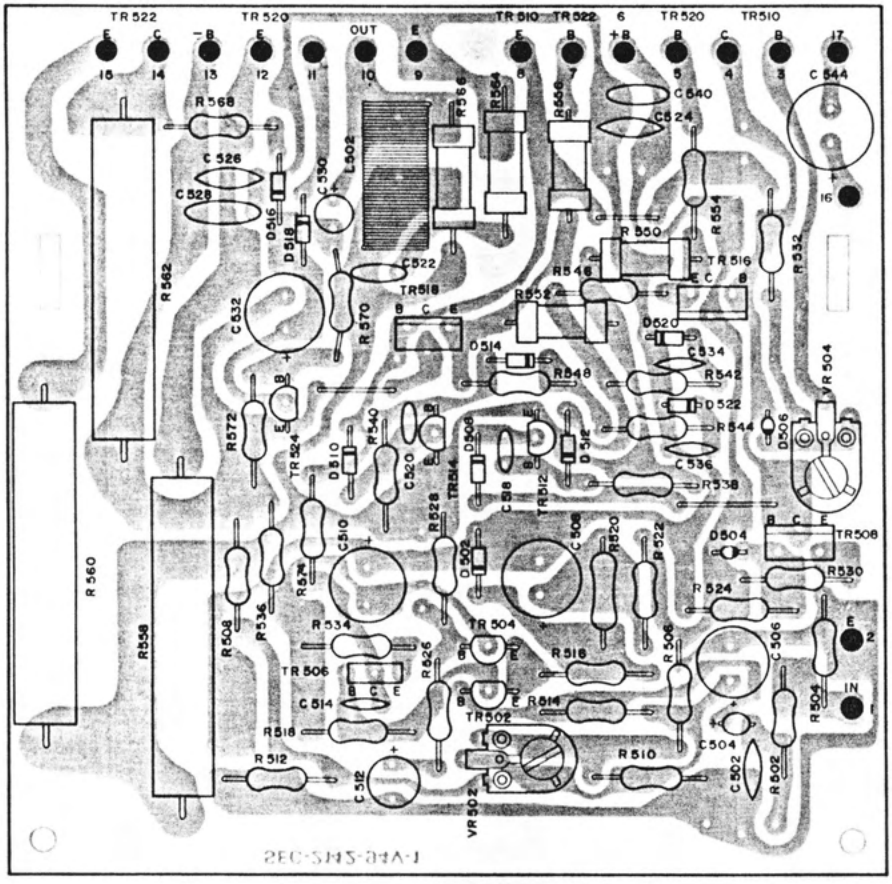


NOTE:

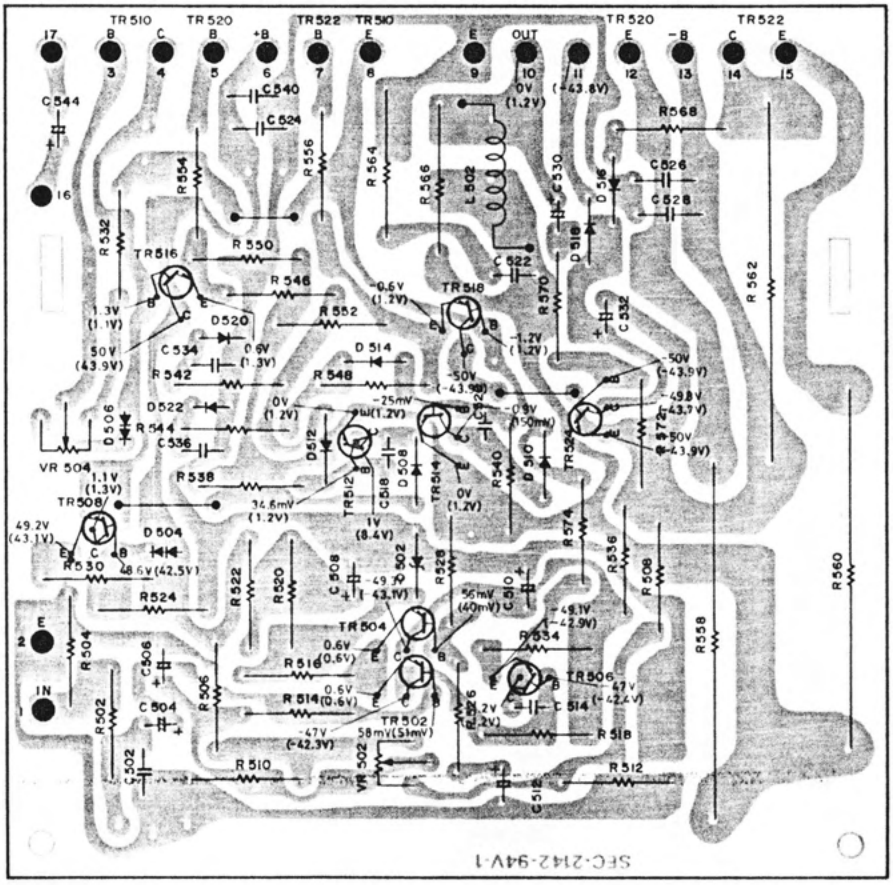
1. Voltages are measured to chassis ground with Voltmeter (Digital Voltmeter, over 10 k Ω/V).
2. Voltages are measured under two conditions : with no input and 75 watts (1 kHz) output power (inside parenthesis) (except AM/FM IF & MPX Board).
3. Voltages on AM/FM IF & MPX Board are measured with no input and Receiver detuned.

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

TOP VIEW

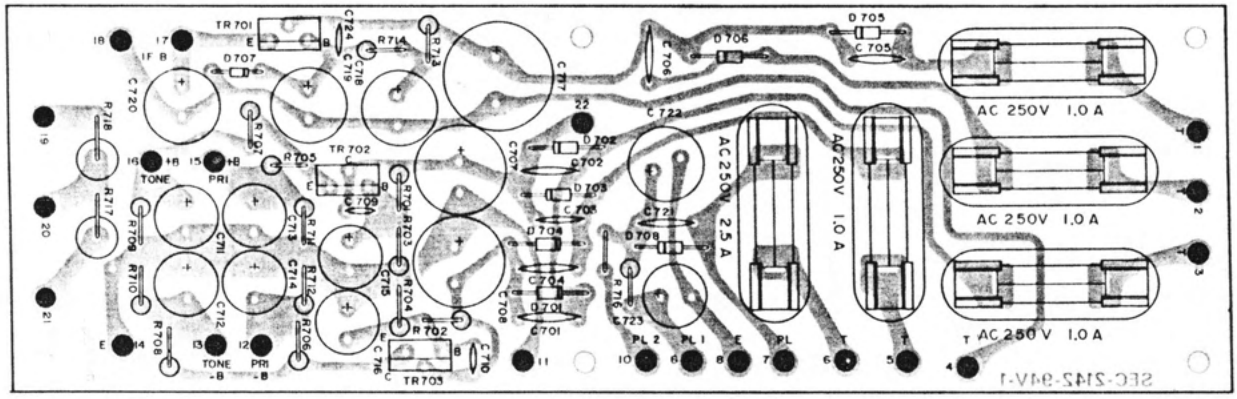


BOTTOM VIEW

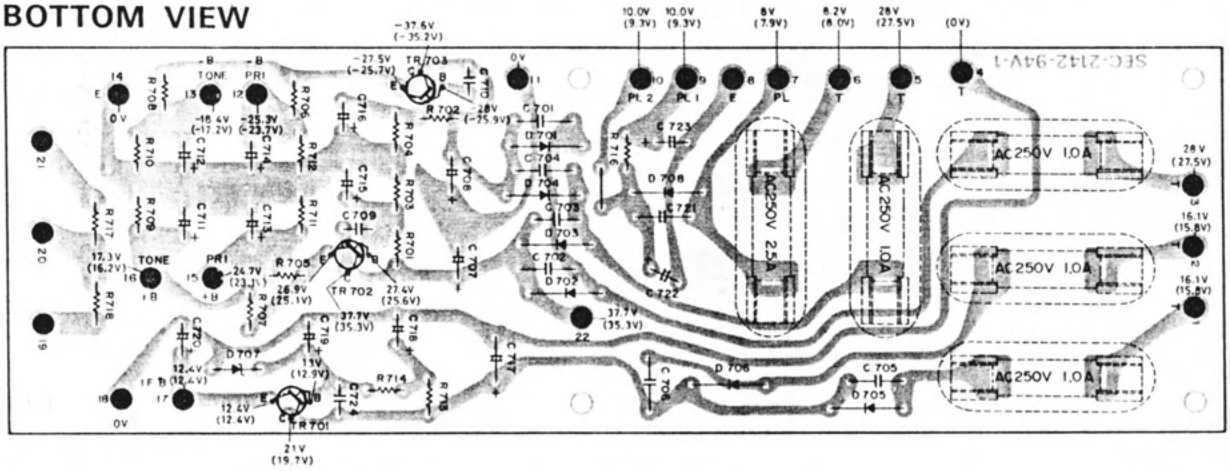


(20) POWER SUPPLY P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

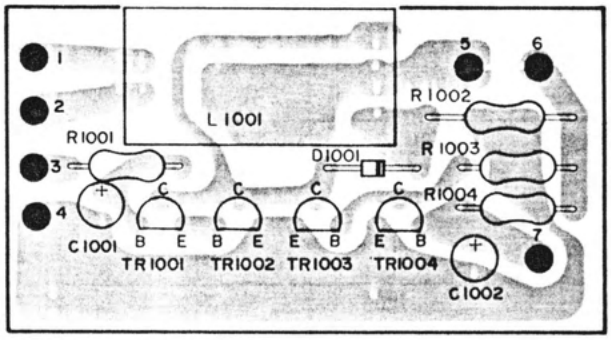


BOTTOM VIEW

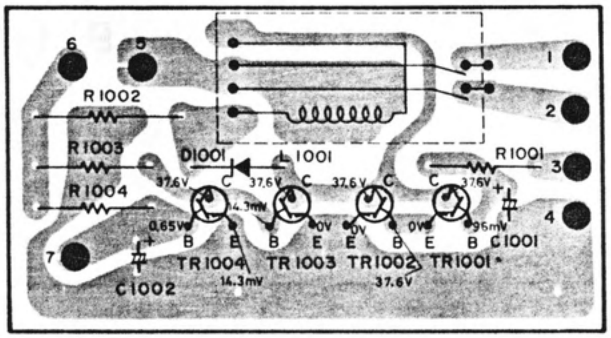


(21) FM MUTING & SWITCH P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

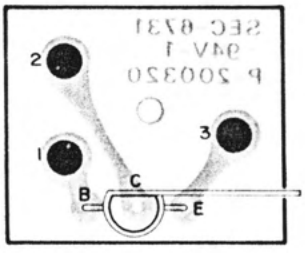


BOTTOM VIEW

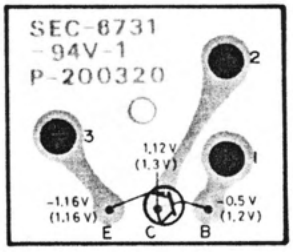


(22) MAIN SUP P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

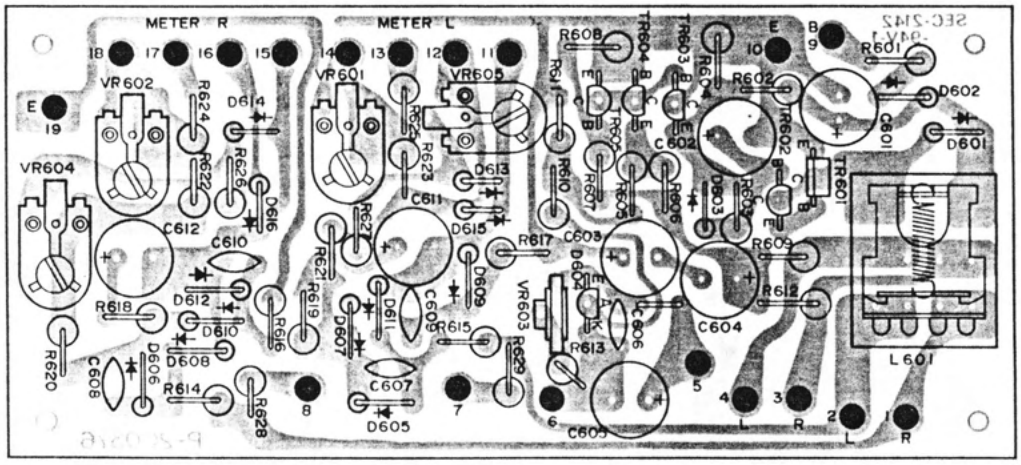


BOTTOM VIEW

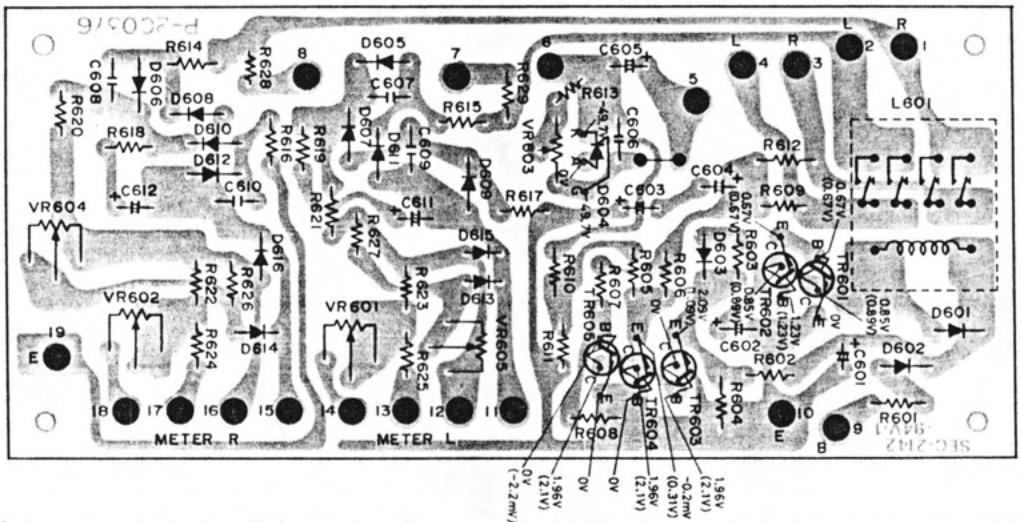


(23) PROTECTOR & METER P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

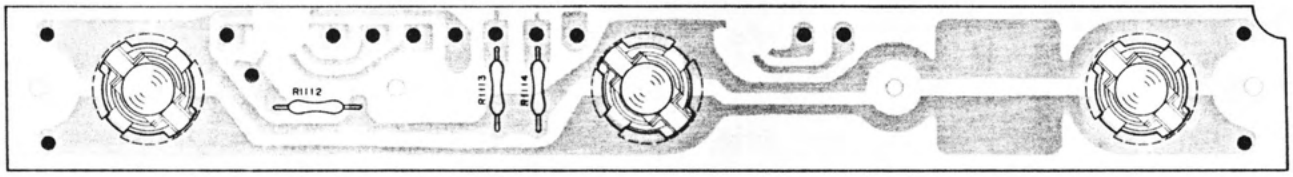


BOTTOM VIEW

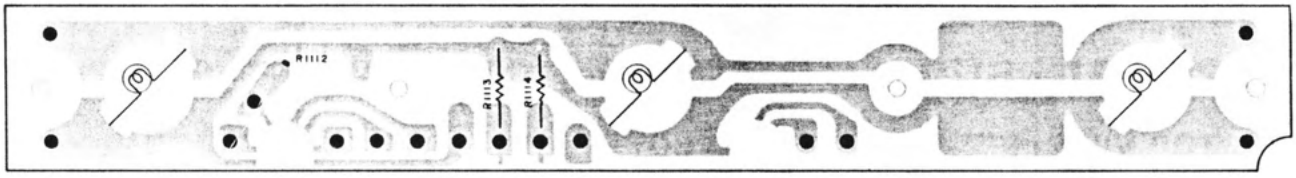


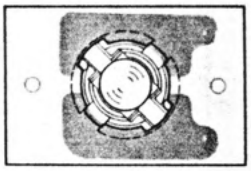
(24) LAMP(A) & LAMP(B) P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW



BOTTOM VIEW





(25) ELECTRICAL PARTS LIST

CAPACITORS

Ref. No.	Value (F)	Voltage (V)	Torerance (%)	Material
C101	0.1μ	50	±20	Mylar
C102	10P	50	± 5	Ceramic
C103	5P	50	± 5	Ceramic
C201	0.01μ	25	+80 −20	Ceramic
C202	0.04μ	25	+80 −20	Ceramic
C203	0.02μ	25	+80 −20	Ceramic
C204	0.01μ	25	+80 −20	Ceramic
C205	0.01μ	25	+80 −20	Ceramic
C206	0.02μ	25	+80 −20	Ceramic
C207	0.01μ	25	+80 −20	Ceramic
C208	0.04μ	25	+80 −20	Ceramic
C209	0.04μ	25	+80 −20	Ceramic
C210	0.04μ	25	+80 −20	Ceramic
C211	0.04μ	25	+80 −20	Ceramic
C212	33P	50	±50	Ceramic
C213	0.47μ	50	+75 −10	Electrolytic
C214	10μ	16	+50 −10	Electrolytic
C215	0.02μ	25	+80 −20	Ceramic
C216	0.04μ	25	+80 −20	Ceramic
C217	1μ	50	+75 −10	Electrolytic
C218	0.04μ	25	+80 −20	Ceramic
C219	0.02μ	25	+80 −20	Ceramic
C220	0.47μ	50	+75 −10	Electrolytic
C221	0.04μ	25	+80 −20	Ceramic
C222	100μ	16	+75 −10	Electrolytic
C223	0.04μ	25	+80 −20	Ceramic
C224	0.04μ	25	+80 −20	Ceramic
C225	(Not used)			
C226	(Not used)			
C227	100μ	16	+75 −10	Electrolytic
C228	0.04μ	25	+80 −20	Ceramic
C229	0.1μ	50	±10	Mylar
C230	0.22μ	25	±20	Aluminum
C231	0.47μ	25	±20	Aluminum
C232	1μ	50	+75 −10	Electrolytic
C233	1500P	50	± 5	Polystyrene
C234	0.047μ	50	±10	Mylar
C235	680P	50	± 5	Polystyrene
C236	10μ	10	±20	Aluminum
C237	10μ	10	±20	Aluminum
C238	(Not used)			
C239	(Not used)			
C240	0.47μ	25	±20	Aluminum
C241	0.47μ	25	±20	Aluminum
C242	220P	50	± 5	Ceramic
C243	220P	50	± 5	Ceramic
C244	0.47μ	25	±20	Aluminum
C245	0.47μ	25	±20	Aluminum
C246	220μ	16	+50 −10	Electrolytic
C247	(Not used)			
C248	0.04μ	25	+80 −20	Ceramic
C249	0.04μ	25	+80 −20	Ceramic
C250	0.02μ	25	+80 −20	Ceramic
C251	0.02μ	25	+80 −20	Ceramic
C252	0.04μ	25	+80 −20	Ceramic
C253	22P	50	± 5	Ceramic
C254	440P	50	± 5	Polystyrene
C255	0.022μ	50	±10	Mylar
C256	0.04μ	25	+80 −20	Ceramic
C257	0.022μ	50	±10	Mylar
C258	0.04μ	25	+80 −20	Ceramic
C259	0.04μ	25	+80 −20	Ceramic
C260	0.01μ	25	+80 −20	Ceramic
C261	0.02μ	25	+80 −20	Ceramic
C262	0.04μ	25	+80 −20	Ceramic
C263	0.01μ	25	+80 −20	Ceramic
C264	0.02μ	25	+80 −20	Ceramic
C265	0.04μ	25	+80 −20	Ceramic
C266	0.0022μ	50	±10	Mylar
C267	4.7μ	25	+50 −10	Electrolytic
C268	0.04μ	25	+80 −20	Ceramic
C269	0.0047μ	50	±10	Mylar
C270	4.7μ	25	+50 −10	Electrolytic

Ref. No.	Value (F)	Voltage (V)	Torerance (%)	Material
C271	0.47μ	50	+75 −10	Electrolytic
C272	(Not used)			
C273	100μ	16	+50 −10	Electrolytic
C274	0.04μ	25	+80 −20	Ceramic
C275	100μ	16	+50 −10	Electrolytic
C276	0.47μ	50	+75 −10	Electrolytic
C277	(Not used)			
C278	220P	50	± 5	Ceramic
C279	0.02μ	25	+80 −20	Ceramic
C280	100μ	16	+50 −10	Electrolytic
C281	0.02μ	25	+80 −20	Ceramic
C282	33P	50	± 5	Ceramic
C283	0.04μ	25	+80 −20	Ceramic
C284	10μ	16	+50 −10	Electrolytic
C285	10μ	16	+50 −10	Electrolytic
C286	10μ	16	+50 −10	Electrolytic
C287	0.027μ	50	±10	Mylar
C288	0.0018μ	50	±10	Mylar
C289	1μ	50	+75 −10	Electrolytic
C290	22μ	16	+50 −10	Electrolytic
C291	100P	25	± 5	Ceramic
C292	(Not used)			
C293	5600P	50	± 2	Polystyrene
C294	5600P	50	± 2	Polystyrene
C301	2.2μ	25	±20	Tantalum
C302	2.2μ	25	±20	Tantalum
C303	100P	50	±10	Ceramic
C304	100P	50	±10	Ceramic
C305	55P	50	±10	Ceramic
C306	55P	50	±10	Ceramic
C307	100μ	25	+50 −10	Electrolytic
C308	100μ	25	+50 −10	Electrolytic
C309	0.0018μ	50	± 5	Mylar
C310	0.0018μ	50	± 5	Mylar
C311	0.0068μ	50	± 5	Mylar
C312	0.0068μ	50	± 5	Mylar
C313	22μ	16	+50 −10	Electrolytic
C314	22μ	16	+50 −10	Electrolytic
C315	0.68μ	25	±20	Tantalum
C316	0.68μ	25	±20	Tantalum
C317	100μ	35	+50 −10	Electrolytic
C318	0.04μ	50	+80 −20	Ceramic
C319	0.04μ	50	+80 −20	Ceramic
C401	4.7μ	25	±20	Tantalum
C402	4.7μ	25	±20	Tantalum
C403	100μ	10	+50 −10	Electrolytic
C404	100μ	10	+50 −10	Electrolytic
C405	10P	50	± 5	Ceramic
C406	10P	50	± 5	Ceramic
C407	22P	50	± 5	Ceramic
C408	22P	50	± 5	Ceramic
C409	100μ	16	+50 −10	Electrolytic
C410	100μ	16	+50 −10	Electrolytic
C411	2.2μ	50	+75 −10	Electrolytic
C412	2.2μ	50	+75 −10	Electrolytic
C413	100μ	10	+50 −10	Electrolytic
C414	100μ	10	+50 −10	Electrolytic
C415	10P	50	± 5	Ceramic
C416	10P	50	± 5	Ceramic
C417	22P	50	± 5	Ceramic
C418	22P	50	± 5	Ceramic
C419	100μ	16	+50 −10	Electrolytic
C420	100μ	16	+50 −10	Electrolytic
C421	2.2μ	25	±20	Tantalum
C422	2.2μ	25	±20	Tantalum
C423	0.001μ	50	±10	Mylar
C424	0.001μ	50	±10	Mylar
C425	0.039μ	50	±10	Mylar
C426	0.039μ	50	±10	Mylar
C427	0.039μ	50	±10	Mylar
C428	0.039μ	50	±10	Mylar
C429	2.2μ	50	+75 −10	Electrolytic
C430	2.2μ	50	+75 −10	Electrolytic
C431	0.47μ	25	±20	Aluminum
C432	0.47μ	25	±20	Aluminum
C433	10P	50	± 5	Ceramic
C434	10P	50	± 5	Ceramic
C435	4.7μ	25	±20	Tantalum
C436	4.7μ	25	±20	Tantalum
C437	100μ	16	+50 −10	Electrolytic
C438	100μ	16	+50 −10	Electrolytic
C439	0.22μ	25	±20	Aluminum
C440	0.22μ	25	±20	Aluminum
C441	10P	50	± 5	Ceramic
C442	10P	50	± 5	Ceramic
C443	2.2μ	25	±20	Tantalum
C444	2.2μ	25	±20	Tantalum
C445	330μ	16	+50 −10	Electrolytic

Ref. No.	Value (F)	Voltage (V)	Torerance (%)	Material
C446	330μ	16	+50 −10	Electrolytic
C447	0.04μ	50	+80 −20	Ceramic
C448	0.04μ	50	+80 −20	Ceramic
C449	0.0082μ	50	± 10	Mylar
C450	0.0082μ	50	± 10	Mylar
C501	200P	50	± 10	Ceramic
C502	200P	50	± 10	Ceramic
C503	4.7μ	25	± 20	Tantalum
C504	4.7μ	25	± 20	Tantalum
C505	100μ	16	+50 −10	Electrolytic
C506	100μ	16	+50 −10	Electrolytic
C507	100μ	63	+50 −10	Electrolytic
C508	100μ	63	+50 −10	Electrolytic
C509	100μ	63	+50 −10	Electrolytic
C510	100μ	63	+50 −10	Electrolytic
C511	100μ	16	+50 −10	Electrolytic
C512	100μ	16	+50 −10	Electrolytic
C513	30P	50	± 5	Ceramic
C514	30P	50	± 5	Ceramic
C515	(Not used)			
C516	(Not used)			
C517	0.0022μ	50	± 10	Mylar
C518	0.0022μ	50	± 10	Mylar
C519	0.0022μ	50	± 10	Mylar
C520	0.0022μ	50	± 10	Mylar
C521	0.082μ	50	± 10	Mylar
C522	0.082μ	50	± 10	Mylar
C523	0.01μ	500	+80 −20	Ceramic
C524	0.01μ	500	+80 −20	Ceramic
C525	0.01μ	500	+80 −20	Ceramic
C526	0.01μ	500	+80 −20	Ceramic
C527	0.1μ	100	± 10	Mylar
C528	0.1μ	100	± 10	Mylar
C529	0.47μ	50	+75 −10	Electrolytic
C530	0.47μ	50	+75 −10	Electrolytic
C531	220μ	16	+50 −10	Electrolytic
C532	220μ	16	+50 −10	Electrolytic
C533	500P	50	± 10	Ceramic
C534	500P	50	± 10	Ceramic
C535	500P	50	± 10	Ceramic
C536	500P	50	± 10	Ceramic
C537	(Not used)			
C538	(Not used)			

Ref. No.	Value (F)	Voltage (V)	Torerance (%)	Material
C539	0.1μ	100	± 10	Mylar
C540	0.1μ	100	± 10	Mylar
C541	(Not used)			
C542	(Not used)			
C543	100μ	63	+50 −10	Electrolytic
C544	100μ	63	+50 −10	Electrolytic
C601	22μ	63	+50 −10	Electrolytic
C602	220μ	16	+50 −10	Electrolytic
C603	220μ	16	+50 −10	Electrolytic
C604	220μ	16	+50 −10	Electrolytic
C605	220μ	16	+50 −10	Electrolytic
C606	0.04μ	50	+80 −20	Ceramic
C607	0.047μ	100	+80 −20	Ceramic
C608	0.047μ	100	+80 −20	Ceramic
C609	0.047μ	100	+80 −20	Ceramic
C610	0.047μ	100	+80 −20	Ceramic
C611	47μ	50	+50 −10	Electrolytic
C612	47μ	50	+50 −10	Electrolytic
C701	0.047μ	100	+80 −20	Ceramic
C702	0.047μ	100	+80 −20	Ceramic
C703	0.047μ	100	+80 −20	Ceramic
C704	0.047μ	100	+80 −20	Ceramic
C705	0.047μ	100	+80 −20	Ceramic
C706	0.047μ	100	+80 −20	Ceramic
C707	220μ	50	+50 −10	Electrolytic
C708	220μ	50	+50 −10	Electrolytic
C709	100P	50	± 10	Ceramic
C710	100P	50	± 10	Ceramic
C711	100μ	35	+50 −10	Electrolytic
C712	100μ	35	+50 −10	Electrolytic
C713	100μ	35	+50 −10	Electrolytic
C714	100μ	35	+50 −10	Electrolytic
C715	100μ	35	+50 −10	Electrolytic
C716	100μ	35	+50 −10	Electrolytic

Ref. No.	Value (F)	Voltage (V)	Torerance (%)	Material
C717	1000μ	25	+50 −10	Electrolytic
C718	47μ	25	+50 −10	Electrolytic
C719	330μ	25	+50 −10	Electrolytic
C720	1000μ	16	+50 −10	Electrolytic
C721	0.047μ	100	+80 −20	Ceramic
C722	1000μ	16	+50 −10	Electrolytic
C723	470μ	16	+50 −10	Electrolytic
C724	100P	50	± 5	Ceramic
C1001	0.1μ	16	±20	Aluminum
C1002	100μ	16	+50 −10	Electrolytic
C1101	0.01μ	125	+80 −20	Ceramic
C1102	0.047μ	500	+80 −20	Ceramic
C1103	0.047μ	500	+80 −20	Ceramic
C1104	0.047μ	500	+80 −20	Ceramic
C1105	0.047μ	500	+80 −20	Ceramic
C1106	15000μ	63	+50 −10	Electrolytic
C1107	15000μ	63	+50 −10	Electrolytic
C1108	0.04μ	250	+80 −20	Ceramic
C1109	0.04μ	250	+80 −20	Ceramic
C1110	0.04μ	250	+80 −20	Ceramic
C1111	0.04μ	250	+80 −20	Ceramic
C1112	0.04μ	250	+80 −20	Ceramic
C1113	0.04μ	250	+80 −20	Ceramic
C1114	1500P	50	± 5	Ceramic
C1115	0.02μ	50	+80 −20	Ceramic
C1116	0.01μ	50	±10	Mylar
C1117	0.01μ	50	±10	Mylar
C1118	0.01μ	50	±10	Mylar
C1201	1μ	16	+75 −10	Electrolytic
C1202	1μ	16	+75 −10	Electrolytic
C1203	10μ	16	+50 −10	Electrolytic
C1204	10μ	16	+50 −10	Electrolytic
C1205	15000P	50	± 2	Polystyrene
C1206	15000P	50	± 2	Polystyrene
C1207	4700P	50	± 2	Polystyrene
C1208	4700P	50	± 2	Polystyrene

Ref. No.	Value (F)	Voltage (V)	Torerance (%)	Material
C1209	0.33μ	16	±20	Tantalum
C1210	0.33μ	16	±20	Tantalum
C1211	15000P	50	± 2	Polystyrene
C1212	15000P	50	± 2	Polystyrene
C1213	0.1μ	50	± 5	Mylar
C1214	0.1μ	50	± 5	Mylar
C1215	10μ	16	+50 −10	Electrolytic
C1216	10μ	16	+50 −10	Electrolytic
C1217	0.1μ	50	± 5	Mylar
C1218	0.1μ	50	± 5	Mylar
C1219	0.33μ	16	±20	Tantalum
C1220	0.33μ	16	±20	Tantalum
C1221	10μ	16	+50 −10	Electrolytic
C1222	470μ	16	+50 −10	Electrolytic

COIL AND TRANSFORMERS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
L101	Choke Coil 0.32μH	CB-2398	P-360023
L201	Micro Inductor 18 μH	C-0709	P-360022
L202	Micro Inductor 2.2 μH	C-0708	P-360021
L501	Choke Coil 2μH	CB-2298	P-370009
L502	Choke Coil 2μH	CB-2298	P-370009
L601	Power Relay MY-4A-02US	R-8081	P-290012
L1001	Reed Relay LAB-2S-C 124V	R-8080	P-290010
L1101	AM Bar Antenna Coil 210μH	CA-3464	P-110065
L1102	Balun Coil 75:300 ohm	CA-2942	P-110012 or P-110098
LPF201	Low Pass Filter Coil		P-510010
T201	FM IFT 3F-033	CA-7606	P-140033
T202	AM RF Coil OR-052	CA-4752	P-340052
T203	AM OSC Coil OC-063	CA-4751	P-120063
T204	AM IFT OA-023	C-0275	P-130023
T205	AM IFT OA-005	CA-7112	P-130005
T206	AM IFT OA-022	CA-7537	P-130022
T1101	Power Transformer	TA-0579	P-100384

CERAMIC FILTERS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
CF201	FM Ceramic Filter (SEF-10.7 MA-8)	CA-7536	P-140030
CF202	FM Ceramic Filter (SEF-10.7 MA-8)	CA-7536	P-140030
CF203	FM Ceramic Filter (SEF-10.7 MA-8)	CA-7536	P-140030

DIODES

Ref. No.	Description	R/S Part No.	Manufacturer
D201	IN-60P	DX-0162	UNIZON
	or IS-188	DX-0551	SANYO, HITACHI
D202	IN-60P	DX-0162	UNIZON
	or IS-188	DX-0551	SANYO, HITACHI

Ref. No.	Description	R/S Part No.	Manufacturer
D203	ITT-73N	DX-1008	ITT
D204	IN-60P	DX-0162	UNIZON
	or IS-188	DX-0551	SANYO,HITACHI
D205	IN-60P	DX-0162	UNIZON
	or IS-188	DX-0551	SANYO,HITACHI
D206	IN-60P	DX-0162	UNIZON
	or IS-188	DX-0551	SANYO,HITACHI
D501	Zener WZ-130	DX-0537	JRC
D502	Zener WZ-130	DX-0537	JRC
D503	Varistor VD-1221	DX-0517	NEC
D504	Varistor VD-1221	DX-0517	NEC
D505	Varistor VD-1221	DX-0517	NEC
D506	Varistor VD-1221	DX-0517	NEC
D507	ITT-73N	DX-1008	ITT
D508	ITT-73N	DX-1008	ITT
D509	ITT-73N	DX-1008	ITT
D510	ITT-73N	DX-1008	ITT
D511	ITT-73N	DX-1008	ITT
D512	ITT-73N	DX-1008	ITT
D513	ITT-73N	DX-1008	ITT
D514	ITT-73N	DX-1008	ITT
D515	IS-188FM1	DX-0888	SANYO
D516	IS-188FM1	DX-0888	SANYO
D517	IS-188FM1	DX-0888	SANYO
D518	IS-188FM1	DX-0888	SANYO
D519	ITT-73N	DX-1008	ITT
D520	ITT-73N	DX-1008	ITT
D521	ITT-73N	DX-1008	ITT
D522	ITT-73N	DX-1008	ITT
D601	SR-1K-2	DX-0475	UNIZON
	or 10E1		INTER-RECTIFIER
D602	SR-1K-2	DX-0475	UNIZON
	or 10E1		INTER-RECTIFIER
D603	ITT-73N	DX-1008	ITT
D604	SCR M21C	DX-0328	MATSUSHITA
	or 2SF 657		NEC
D605	1K-100-350	DX-0033	UNIZON
D606	1K-100-350	DX-0033	UNIZON
D607	1K-100-350	DX-0033	UNIZON
D608	1K-100-350	DX-0033	UNIZON
D609	1K-100-350	DX-0033	UNIZON
D610	1K-100-350	DX-0033	UNIZON
D611	1K-100-350	DX-0033	UNIZON
D612	1K-100-350	DX-0033	UNIZON
D613	Varistor	DX-0033	UNIZON
	KB-162	DX-0685	UNIZON
D614	Varistor	DX-0685	UNIZON
	KB-162	DX-0685	UNIZON
D615	2-1K261	DX-1107	UNIZON
D616	2-1K261	DX-1107	UNIZON
D701	SR-1K-2	DX-0475	UNIZON
	or 10E-1		INTER-RECTIFIER
D702	SR-1K-2	DX-0475	UNIZON
	or 10E-1		INTER-RECTIFIER
D703	SR-1K-2	DX-0475	UNIZON
	or 10E-1		INTER-RECTIFIER
D704	SR-1K-2	DX-0475	UNIZON
	or 10E-1		INTER-RECTIFIER
D705	SR-1K-2	DX-0475	UNIZON
	or 10E-1		INTER-RECTIFIER
D700	SR-1K-2	DX-0475	UNIZON
	or 10E-1		INTER-RECTIFIER
D707	Zener WX-137	DX-1106	JRC
D708	SR-1K-2	DX-0475	UNIZON
	or 10E-1		INTER-RECTIFIER
D1001	SR-1K-2		UNIZON
	or 10D-1		INTER-RECTIFIER
D1101	S15VB	DX-1040	SHINDENGEN
D1201	1N34A	DX-0162	HITACHI
	or 1N-60P		UNIZON
D1202	1N34A	DX-0162	HITACHI
	or 1N-60P		UNIZON
D1203	1S-2076	DX-0287	HITACHI
D1204	1S-2076	DX-0287	HITACHI

FUSES

Ref. No.	Description	R/S Part No.	Mfr's Part No.
	Fuse Quick 1 A, 250V	HF-0036	P-250013
	Fuse Quick 2.5A, 250V	HF-0021	P-250008
	Fuse Quick 7 A, 125V	HF-1124	P-250101

INTEGRATED CIRCUITS

Ref. No.	Description	R/S Part No.	Manufacturer
IC201	IC LA-1230	MX-3210	SANYO
IC202	IC LA-3350	MX-3215	SANYO
IC1201	IC HA-11226 (DOLBY)	MX-3590	HITACHI

FRONT END

Ref. No.	Description	R/S Part No.	Mfr's Part No.
	Front End Ass'y FL526U12-7603	C-4582	P-150020

LAMPS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
PL 1	Wedge 8V, 0.3A	L-0690	P-240076
PL 2	Wedge 8V, 0.3A	L-0690	P-240076
PL 3	Wedge 8V, 0.3A	L-0690	P-240076
PL 4	Fuse type 8V, 0.3A	L-0864	P-240091
PL 5	Wedge 8V, 0.3A	L-0690	P-240076
PL 6	Lamp with Lead 6V, 60 mA	L-0717	P-240090
PL 7	Lamp with Lead 6V, 60 mA	L-0717	P-240090
PL 8	Lamp with Lead 6V, 60 mA	L-0717	P-240090
PL 9	Lamp with Lead 6V, 60 mA	L-0717	P-240090
PL10	Lamp with Lead 6V, 60 mA	L-0717	P-240090
PL11	Lamp with Lead 6V, 60 mA	L-0717	P-240090

METERS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
	Tuning Meter ± 100μA, 1.2KΩ	M-0314	P-230047
	Wattage Meter (Right) 200μA, 1.2KΩ	M-0312	P-230048
	Wattage Meter (Left) 200μA, 1.2KΩ	M-0313	P-230049

PROTECTOR

Ref. No.	Description	R/S Part No.	Mfr's Part No.
	Temperature Protector 95° ± 5°	HB-6880	P-290018

RESISTORS

Ref. No.	Value (ohm)	Wattage (W)	Tolerance (%)	Material	R/S Part No.
R101	2.7K	¼	± 5	Carbon	NEE-0224
R102	10K	¼	± 5	Carbon	NEE-0281
R201	100	¼	± 5	Carbon	NEE-0132
R202	330	¼	± 5	Carbon	NEE-0159
R203	10K	¼	± 5	Carbon	NEE-0281
R204	3.9K	¼	± 5	Carbon	NEE-0237
R205	1K	¼	± 5	Carbon	NEE-0196
R206	330	¼	± 5	Carbon	NEE-0159
R207	390	¼	± 5	Carbon	NEE-0162
R208	100	¼	± 5	Carbon	NEE-0132
R209	560	¼	± 5	Carbon	NEE-0176
R210	2.2K	¼	± 5	Carbon	NEE-0216
R211	10K	¼	± 5	Carbon	NEE-0281
R212	1K	¼	± 5	Carbon	NEE-0196
R213	330	¼	± 5	Carbon	NEE-0159
R214	100	¼	± 5	Carbon	NEE-0132
R215	330	¼	± 5	Carbon	NEE-0159
R216	56K	¼	± 5	Carbon	NEE-0345
R217	100K	¼	± 5	Carbon	NEE-0371
R218	1K	¼	± 5	Carbon	NEE-0196
R219	4.7K	¼	± 5	Carbon	NEE-0247
R220	47K	¼	± 5	Carbon	NEE-0340
R221	10K	¼	± 5	Carbon	NEE-0281
R222	10K	¼	± 5	Carbon	NEE-0281
R223	2.2K	¼	± 5	Carbon	NEE-0216
R224	3.9K	¼	± 5	Carbon	NEE-0237
R225	2.7K	¼	± 5	Carbon	NEE-0224
R226	8.2K	¼	± 5	Carbon	NEE-0271
R227	47	¼	± 5	Carbon	NEE-0340
R228	1K	¼	± 5	Carbon	NEE-0196
R229	470K	¼	± 5	Carbon	NEE-0423
R230	22	¼	± 5	Carbon	NEE-0078
R231	150	¼	± 5	Carbon	NEE-0142
R232	10K	¼	± 5	Carbon	NEE-0281
R233	47K	¼	± 5	Carbon	NEE-0340
R234	3.3K	¼	± 5	Carbon	NEE-0230
R235	3.3K	¼	± 5	Carbon	NEE-0230
R236	1K	¼	± 5	Carbon	NEE-0196
R237	100	¼	± 5	Carbon	NEE-0132
R238	47K	¼	± 5	Carbon	NEE-0340
R239	8.2K	¼	± 5	Carbon	NEE-0271
R240	3.3K	¼	± 5	Carbon	NEE-0230
R241	3.3K	¼	± 5	Carbon	NEE-0230
R242	3.9K	¼	± 5	Carbon	NEE-0237
R243	3.9K	¼	± 5	Carbon	NEE-0237
R244	1.5M	¼	± 5	Carbon	NEE-0450
R245	1.5M	¼	± 5	Carbon	NEE-0450
R246	1K	¼	± 5	Carbon	NEE-0196
R247	1K	¼	± 5	Carbon	NEE-0196
R248	5.6K	¼	± 5	Carbon	NEE-0257
R249	5.6K	¼	± 5	Carbon	NEE-0257
R250	39K	¼	± 5	Carbon	NEE-0330
R251	39K	¼	± 5	Carbon	NEE-0330
R252	220	¼	± 5	Carbon	NEE-0149
R253	330	¼	± 5	Carbon	NEE-0159
R254	1K	¼	± 5	Carbon	NEE-0196
R255	1.5K	¼	± 5	Carbon	NEE-0206
R256	1K	¼	± 5	Carbon	NEE-0196
R257	82K	¼	± 5	Carbon	NEE-0360
R258	100	¼	± 5	Carbon	NEE-0132
R259	1K	¼	± 5	Carbon	NEE-0196
R260	10K	¼	± 5	Carbon	NEE-0281
R261	2.2K	¼	± 5	Carbon	NEE-0216
R262	15K	¼	± 5	Carbon	NEE-0297
R263	1.5K	¼	± 5	Carbon	NEE-0206
R264	4.7K	¼	± 5	Carbon	NEE-0247
R265	47	¼	± 5	Carbon	NEE-0099
R266	1.5K	¼	± 5	Carbon	NEE-0206
R267	27K	¼	± 5	Carbon	NEE-0316
R268	4.7K	¼	± 5	Carbon	NEE-0247
R269	4.7K	¼	± 5	Carbon	NEE-0240
R270	1K	¼	± 5	Carbon	NEE-0196
R271	330	¼	± 5	Carbon	NEE-0159
R272	680	¼	± 5	Carbon	NEE-0183
R273	1K	¼	± 5	Carbon	NEE-0196
R274	68K	¼	± 5	Carbon	NEE-0354
R275	100	¼	± 5	Carbon	NEE-0132
R276	10K	¼	± 5	Carbon	NEE-0281
R277	22K	¼	± 5	Carbon	NEE-0311
R278	820	¼	± 5	Carbon	NEE-0187
R279	1K	¼	± 5	Carbon	NEE-0196
R280	47	¼	± 5	Carbon	NEE-0099
R281	5.6K	¼	± 5	Carbon	NEE-0257
R282	4.7K	¼	± 5	Carbon	NEE-0247
R283	22K	¼	± 5	Carbon	NEE-0311
R284	150K	¼	± 5	Carbon	NEE-0384
R285	4.7K	¼	± 5	Carbon	NEE-0247
R286	150K	¼	± 5	Carbon	NEE-0384
R287	220	¼	± 5	Carbon	NEE-0149
R288	4.7K	¼	± 5	Carbon	NEE-0247
R289	1.5M	¼	± 5	Carbon	NEE-0450
R290	8.2K	¼	± 5	Carbon	NEE-0271
R291	1.8K	¼	± 5	Carbon	NEE-0210
R292	47	¼	± 5	Carbon	NEE-0099
R293	10K	¼	± 5	Carbon	NEE-0281
R294	18K	¼	± 5	Carbon	NEE-0303
R295	1K	¼	± 5	Carbon	NEE-0196
R296	10K	¼	± 5	Carbon	NEE-0281
R297	10K	¼	± 5	Carbon	NEE-0281
R298	33K	¼	± 5	Carbon	NEE-0324
R299	2.2K	¼	± 5	Carbon	NEE-0216
R301	100K	¼	± 5	Carbon	NEE-0371
R302	100K	¼	± 5	Carbon	NEE-0371
R303	4.7K	¼	± 5	Carbon	NEE-0247

Ref. No.	Value (ohm)	Wattage (W)	Tolerance (%)	Material	R/S Part No.
R304	4.7K	¼	± 5	Carbon	NEE-0247
R305	390K	¼	± 5	Carbon	NEE-0414
R306	390K	¼	± 5	Carbon	NEE-0414
R307	22K	¼	± 5	Carbon	NEE-0311
R308	22K	¼	± 5	Carbon	NEE-0311
R309	180K	¼	± 5	Carbon	NEE-0387
R310	180K	¼	± 5	Carbon	NEE-0387
R311	270	¼	± 5	Carbon	NEE-0155
R312	270	¼	± 5	Carbon	NEE-0155
R313	820	¼	± 5	Carbon	NEE-0187
R314	820	¼	± 5	Carbon	NEE-0187
R315	39K	¼	± 5	Carbon	NEE-0330
R316	39K	¼	± 5	Carbon	NEE-0330
R317	680K	¼	± 5	Carbon	NEE-0433
R318	680K	¼	± 5	Carbon	NEE-0433
R319	560	¼	± 5	Carbon	NEE-0176
R320	560	¼	± 5	Carbon	NEE-0176
R321	10K	¼	± 5	Carbon	NEE-0281
R322	10K	¼	± 5	Carbon	NEE-0281
R323	4.7K	¼	± 5	Carbon	NEE-0247
R324	4.7K	¼	± 5	Carbon	NEE-0247
R325	100	¼	± 5	Carbon	NEE-0132
R326	100	¼	± 5	Carbon	NEE-0132
R327	47K	¼	± 5	Carbon	NEE-0340
R328	47K	¼	± 5	Carbon	NEE-0340
R329	15K	¼	± 5	Carbon	NEE-0297
R401	4.7K	¼	± 5	Carbon	NEE-0247
R402	4.7K	¼	± 5	Carbon	NEE-0247
R403	680K	¼	± 5	Carbon	NEE-0433
R404	680K	¼	± 5	Carbon	NEE-0433
R405	330K	¼	± 5	Carbon	NEE-0410
R406	330K	¼	± 5	Carbon	NEE-0410
R407	33K	¼	± 5	Carbon	NEE-0324
R408	33K	¼	± 5	Carbon	NEE-0324
R409	12K	¼	± 5	Carbon	NEE-0288
R410	12K	¼	± 5	Carbon	NEE-0288
R411	10K	¼	± 5	Carbon	NEE-0281
R412	10K	¼	± 5	Carbon	NEE-0281
R413	33K	¼	± 5	Carbon	NEE-0324
R414	33K	¼	± 5	Carbon	NEE-0324
R415	12K	¼	± 5	Carbon	NEE-0288
R416	12K	¼	± 5	Carbon	NEE-0288
R417	1.5K	¼	± 5	Carbon	NEE-0206
R418	1.5K	¼	± 5	Carbon	NEE-0206
R419	8.2K	¼	± 5	Carbon	NEE-0271
R420	8.2K	¼	± 5	Carbon	NEE-0271
R421	680K	¼	± 5	Carbon	NEE-0433
R422	680K	¼	± 5	Carbon	NEE-0433
R423	330K	¼	± 5	Carbon	NEE-0410
R424	330K	¼	± 5	Carbon	NEE-0410
R425	33K	¼	± 5	Carbon	NEE-0324
R426	33K	¼	± 5	Carbon	NEE-0324
R427	12K	¼	± 5	Carbon	NEE-0288
R428	12K	¼	± 5	Carbon	NEE-0288
R429	10K	¼	± 5	Carbon	NEE-0281
R430	10K	¼	± 5	Carbon	NEE-0281
R431	18K	¼	± 5	Carbon	NEE-0303
R432	18K	¼	± 5	Carbon	NEE-0303
R433	12K	¼	± 5	Carbon	NEE-0288
R434	12K	¼	± 5	Carbon	NEE-0288
R435	1.5K	¼	± 5	Carbon	NEE-0206
R436	1.5K	¼	± 5	Carbon	NEE-0206
R437	8.2K	¼	± 5	Carbon	NEE-0271
R438	8.2K	¼	± 5	Carbon	NEE-0271
R439	68K	¼	± 5	Carbon	NEE-0354
R440	68K	¼	± 5	Carbon	NEE-0354
R441	1K	¼	± 5	Carbon	NEE-0196
R442	1K	¼	± 5	Carbon	NEE-0196
R443	1K	¼	± 5	Carbon	NEE-0196
R444	1K	¼	± 5	Carbon	NEE-0196
R445	12K	¼	± 5	Carbon	NEE-0288
R446	12K	¼	± 5	Carbon	NEE-0288
R447	12K	¼	± 5	Carbon	NEE-0288
R448	12K	¼	± 5	Carbon	NEE-0288
R449	8.2K	¼	± 5	Carbon	NEE-0271
R450	8.2K	¼	± 5	Carbon	NEE-0271
R451	220K	¼	± 5	Carbon	NEE-0396
R452	220K	¼	± 5	Carbon	NEE-0396
R453	390K	¼	± 5	Carbon	NEE-0414
R454	390K	¼	± 5	Carbon	NEE-0414
R455	18K	¼	± 5	Carbon	NEE-0303
R456	18K	¼	± 5	Carbon	NEE-0303
R457	100K	¼	± 5	Carbon	NEE-0371
R458	100K	¼	± 5	Carbon	NEE-0371
R459	68K	¼	± 5	Carbon	NEE-0354
R460	68K	¼	± 5	Carbon	NEE-0354
R461	1.5K	¼	± 5	Carbon	NEE-0206
R462	1.5K	¼	± 5	Carbon	NEE-0206
R463	39K	¼	± 5	Carbon	NEE-0330
R464	39K	¼	± 5	Carbon	NEE-0330
R465	100K	¼	± 5	Carbon	NEE-0371
R466	100K	¼	± 5	Carbon	NEE-0371
R467	4.7K	¼	± 5	Carbon	NEE-0247
R468	4.7K	¼	± 5	Carbon	NEE-0247
R469	5.6K	¼	± 5	Carbon	NEE-0257
R470	5.6K	¼	± 5	Carbon	NEE-0257
R471	1M	¼	± 5	Carbon	NEE-0445
R472	1M	¼	± 5	Carbon	NEE-0445
R473	220	¼	± 5	Carbon	NEE-0149
R474	220	¼	± 5	Carbon	NEE-0149
R475	6.8K	¼	± 5	Carbon	NEE-0262
R476	6.8K	¼	± 5	Carbon	NEE-0262
R477	1M	¼	± 5	Carbon	NEE-0445
R478	1M	¼	± 5	Carbon	NEE-0445
R501	4.7K	½	± 5	Carbon	NEF-0247
R502	4.7K	½	± 5	Carbon	NEF-0247
R503	1M	½	± 5	Carbon	NEF-0445
R504	1M	½	± 5	Carbon	NEF-0445
R505	6.8K	½	± 5	Carbon	NEF-0262
R506	6.8K	½	± 5	Carbon	NEF-0262
R507	6.8K	½	± 5	Carbon	NEF-0262
R508	6.8K	½	± 5	Carbon	NEF-0262

Ref. No.	Value (ohm)	Wattage (W)	Tolerance (%)	Material	R/S Part No.
R509	47	½	± 5	Carbon	NEF-0099
R510	47	½	± 5	Carbon	NEF-0099
R511	47	½	± 5	Carbon	NEF-0099
R512	47	½	± 5	Carbon	NEF-0099
R513	47K	½	± 5	Carbon	NEF-0340
R514	47K	½	± 5	Carbon	NEF-0340
R515	8.2K	½	± 5	Carbon	NEF-0271
R516	8.2K	½	± 5	Carbon	NEF-0271
R517	2.2K	½	± 5	Carbon	NEF-0216
R518	2.2K	½	± 5	Carbon	NEF-0216
R519	2.2K	1	± 5	Metal Oxide	NEG-0216
R520	2.2K	1	± 5	Metal Oxide	NEG-0216
R521	68	½	± 5	Carbon	NEF-0111
R522	68	½	± 5	Carbon	NEF-0111
R523	18K	½	± 5	Carbon	NEF-0303
R524	18K	½	± 5	Carbon	NEF-0303
R525	1.8K	½	± 5	Carbon	NEF-0210
R526	1.8K	½	± 5	Carbon	NEF-0210
R527	47K	½	± 5	Carbon	NEF-0340
R528	47K	½	± 5	Carbon	NEF-0340
R529	82	½	± 5	Carbon	NEF-0122
R530	82	½	± 5	Carbon	NEF-0122
R531	3.3K	½	± 5	Carbon	NEF-0230
R532	3.3K	½	± 5	Carbon	NEF-0230
R533	22	½	± 5	Carbon	NEF-0078
R534	22	½	± 5	Carbon	NEF-0078
R535	68	½	± 5	Carbon	NEF-0111
R536	68	½	± 5	Carbon	NEF-0111
R537	470	½	± 5	Carbon	NEF-0169
R538	470	½	± 5	Carbon	NEF-0169
R539	470	½	± 5	Carbon	NEF-0169
R540	470	½	± 5	Carbon	NEF-0169
R541	12K	½	± 5	Carbon	NEF-0288
R542	12K	½	± 5	Carbon	NEF-0288
R543	12K	½	± 5	Carbon	NEF-0288
R544	12K	½	± 5	Carbon	NEF-0288
R545	1K	½	± 5	Carbon	NEF-0196
R546	1K	½	± 5	Carbon	NEF-0196
R547	1K	½	± 5	Carbon	NEF-0196
R548	1K	½	± 5	Carbon	NEF-0196
R549	150	1	± 5	Metal Oxide	NEG-0142
R550	150	1	± 5	Metal Oxide	NEG-0142
R551	150	1	± 5	Metal Oxide	NEG-0142
R552	150	1	± 5	Metal Oxide	NEG-0142
R553	4.7	1	± 5	Metal Oxide	NEG-0047
R554	4.7	1	± 5	Metal Oxide	NEG-0047
R555	4.7	1	± 5	Metal Oxide	NEG-0047
R556	4.7	1	± 5	Metal Oxide	NEG-0047
R557	0.5	10	± 5	Cement	NEM-0010
R558	0.5	10	± 5	Cement	NEM-0010
R559	0.5	10	± 5	Cement	NEM-0010
R560	0.5	10	± 5	Cement	NEM-0010
R561	0.5	10	± 5	Cement	NEM-0010
R562	0.5	10	± 5	Cement	NEM-0010
R563	10	2	± 5	Metal Oxide	NEH-0063
R564	10	2	± 5	Metal Oxide	NEH-0063
R565	22	2	± 5	Metal Oxide	NEH-0078
R566	22	2	± 5	Metal Oxide	NEH-0078
R567	470	½	± 5	Carbon	NEF-0169
R568	470	½	± 5	Carbon	NEF-0169
R569	47K	½	± 5	Carbon	NEF-0340
R570	47K	½	± 5	Carbon	NEF-0340
R571	2.2K	½	± 5	Carbon	NEF-0216
R572	2.2K	½	± 5	Carbon	NEF-0216
R573	10	½	± 5	Carbon	NEF-0063
R574	10	½	± 5	Carbon	NEF-0063
R601	150	2	± 5	Metal Oxide	NEH-0142
R602	10K	¼	± 5	Carbon	NEE-0281
R603	27K	¼	± 5	Carbon	NEE-0316
R604	1K	¼	± 5	Carbon	NEE-0196
R605	10K	¼	± 5	Carbon	NEE-0281
R606	10K	¼	± 5	Carbon	NEE-0281
R607	5.6K	¼	± 5	Carbon	NEE-0257
R608	3.9K	¼	± 5	Carbon	NEE-0237
R609	18K	¼	± 5	Carbon	NEE-0303
R610	1.5K	3	± 5	Metal Oxide	NEJ-0206
R611	150	½	± 5	Carbon	NEF-0142
R612	18K	¼	± 5	Carbon	NEE-0303
R613	1.2K	¼	± 5	Carbon	NEE-0199
R614	47	½	± 5	Carbon	NEF-0099
R615	47	½	± 5	Carbon	NEF-0099
R616	47	½	± 5	Carbon	NEF-0099
R617	47	½	± 5	Carbon	NEF-0099
R618	22	½	± 5	Carbon	NEF-0078
R619	22	½	± 5	Carbon	NEF-0078
R620	1.8K	2	± 5	Metal Oxide	NEH-0210
R621	1.8K	2	± 5	Metal Oxide	NEH-0210
R622	2.2K	¼	± 5	Carbon	NEE-0216
R623	2.2K	¼	± 5	Carbon	NEE-0216
R624	15K	¼	± 5	Carbon	NEE-0297
R625	15K	¼	± 5	Carbon	NEE-0297
R626	47	¼	± 5	Carbon	NEE-0099
R627	47	¼	± 5	Carbon	NEE-0099
R628	1K	½	± 5	Carbon	NEF-0196
R629	1K	½	± 5	Carbon	NEF-0196
R701	8.2K	¼	± 5	Carbon	NEE-0271
R702	8.2K	¼	± 5	Carbon	NEE-0271
R703	27K	¼	± 5	Carbon	NEE-0316
R704	27K	¼	± 5	Carbon	NEE-0316
R705	100	½	± 5	Carbon	NEF-0132

Ref. No.	Value (ohm)	Wattage (W)	Tolerance (%)	Material	R/S Part No.
R706	100	½	± 5	Carbon	NEF-0132
R707	470	½	± 5	Carbon	NEF-0169
R708	390	½	± 5	Carbon	NEF-0162
R709	4.7K	½	± 5	Carbon	NEF-0247
R710	4.7K	½	± 5	Carbon	NEF-0247
R711	4.7K	½	± 5	Carbon	NEF-0247
R712	4.7K	½	± 5	Carbon	NEF-0247
R713	1K	¼	± 5	Carbon	NEE-0196
R714	1K	¼	± 5	Carbon	NEE-0196
R715	(Not used)				
R716	68	½	± 5	Carbon	NEF-0111
R717	150	3	± 5	Metal Oxide	NEJ-0142
R718	150	3	± 5	Metal Oxide	NEJ-0142
R801	8.2K	¼	± 5	Carbon	NEE-0271
R802	8.2K	¼	± 5	Carbon	NEE-0271
R803	4.7K	¼	± 5	Carbon	NEE-0247
R804	4.7K	¼	± 5	Carbon	NEE-0247
R805	4.7K	¼	± 5	Carbon	NEE-0247
R806	4.7K	¼	± 5	Carbon	NEE-0247
R1001	39K	¼	± 5	Carbon	NEE-0330
R1002	1K	½	± 5	Carbon	NEF-0196
R1003	56K	¼	± 5	Carbon	NEE-0345
R1004	220K	¼	± 5	Carbon	NEE-0396
R1005	100K	¼	± 5	Carbon	NEE-0371
R1101	2.2M	½	± 5	Carbon	NEF-0454
R1102	180K	¼	± 5	Carbon	NEE-0387
R1103	180K	¼	± 5	Carbon	NEE-0387
R1104	180K	¼	± 5	Carbon	NEE-0387
R1105	180K	¼	± 5	Carbon	NEE-0387
R1106	22K	¼	± 5	Carbon	NEE-0311
R1107	22K	¼	± 5	Carbon	NEE-0311
R1108	(Not used)				
R1109	(Not used)				
R1110	120K	¼	± 5	Carbon	NEE-0375
R1111	120K	¼	± 5	Carbon	NEE-0375
R1112	68	½	± 5	Carbon	NEF-0354
R1113	68	½	± 5	Carbon	NEF-0354
R1114	68	½	± 5	Carbon	NEF-0354
R1115	100	¼	± 5	Carbon	NEE-0132
R1201	100K	¼	± 5	Carbon	NEE-0371
R1202	100K	¼	± 5	Carbon	NEE-0371
R1203	1K	¼	± 5	Carbon	NEE-0196
R1204	1K	¼	± 5	Carbon	NEE-0196
R1205	180	¼	± 5	Carbon	NEE-0144
R1206	180	¼	± 5	Carbon	NEE-0144
R1207	3.9K	¼	± 2	Carbon	NGE-0237
R1208	3.9K	¼	± 2	Carbon	NGE-0237
R1209	47K	¼	± 5	Carbon	NEE-0340
R1210	47K	¼	± 5	Carbon	NEE-0340

Ref. No.	Value (ohm)	Wattage (W)	Tolerance (%)	Material	R/S Part No.
R1211	12K	¼	± 5	Carbon	NEE-0288
R1212	12K	¼	± 5	Carbon	NEE-0288
R1213	270K	¼	± 2	Carbon	NGE-0402
R1214	270K	¼	± 2	Carbon	NGE-0402
R1215	270K	¼	± 5	Carbon	NEE-0402
R1216	270K	¼	± 5	Carbon	NEE-0402
R1217	1K	¼	± 5	Carbon	NEE-0196
R1218	1K	¼	± 5	Carbon	NEE-0196

SWITCHES

Ref. No.	Description	R/S Part No.	Mfr's Part No.
	Lever Switch A	S-5039	P-180210
	Lever Switch B	S-5038	P-180209
Sal-	Rotary Switch (SELECTOR)	S-1226	P-180213
Salo	Push Switch A (MPX FILTER/ MUTE/MONO/LOUDNESS)	S-7282	P-180211
	Push Switch B (DOLBY FM/ SPEAKERS/POWER)	S-0853	P-180297

TRANSISTORS

Ref. No.	Description	Manufacturer
TR201	2SC 1675 (L) (K)	NEC
TR202	2SC 1675 (L) (K)	NEC
TR203	2SC 536 (H)	SANYO
TR204	2SC 536 (H)	SANYO
TR205	2SC 536 (H)	SANYO
TR206	2SC 536 (H)	SANYO
TR207	2SC 536 (H)	SANYO
TR208	2SC 929 (E)	SANYO
	or 2SC 829 (D)	MATSUSHITA
TR209	2SC 929 (E)	SANYO
	or 2SC 829 (D)	MATSUSHITA
TR210	2SC 929 (E)	SANYO
	or 2SC 829 (D)	MATSUSHITA
TR211	2SC 929 (E)	SANYO
	or 2SC 829 (D)	MATSUSHITA
TR212	2SC 536 (H)	SANYO
TR213	2SC 929 (E)	SANYO
	or 2SC 829 (D)	MATSUSHITA
TR214	2SC 536 (H)	SANYO
TR215	2SC 536 (H)	SANYO
TR216	2SC 536 (H)	SANYO
TR301	2SC 1222 (2) (E,U)	NEC
TR302	2SC 1222 (2) (E,U)	NEC
TR303	2SC 1222 (2) (E,U)	NEC
TR304	2SC 1222 (2) (E,U)	NEC
TR305	2SA 750 (E)	NEC
TR306	2SA 750 (E)	NEC
TR307	2SC 1222 (2) (E,U)	NEC
TR308	2SC 1222 (2) (E,U)	NEC
TR401	2SC 1222 (2) (E,U)	NEC
TR402	2SC 1222 (2) (E,U)	NEC
TR403	2SA 750 (E,F)	NEC

Ref. No.	Description	Manufacturer
TR404	2SA 750 (E,F)	NEC
TR405	2SC 1222 (2) (E,U)	NEC
TR406	2SC 1222 (2) (E,U)	NEC
TR407	2SC 750 (E,F)	NEC
TR408	2SA 750 (E,F)	NEC
TR409	2SC 1222 (2) (E,U)	NEC
TR410	2SC 1222 (2) (E,U)	NEC
TR411	2SC 1222 (E)	NEC
TR412	2SC 1222 (E)	NEC
TR501	2SA 750 (1) (E)	NEC
TR502	2SA 750 (1) (E)	NEC
TR503	2SA 750 (1) (E)	NEC
TR504	2SA 750 (1) (E)	NEC
TR505	2SC 1953 (R,S)	MATSUSHITA
TR506	2SC 1953 (R,S)	MATSUSHITA
TR507	2SB 536 (K,L)	NEC
TR508	2SB 536 (K,L)	NEC
TR509	2SD 261 (P,Q)	NEC
TR510	2SD 261 (P,Q)	NEC
TR511	2SC 945 (P,Q)	NEC
TR512	2SC 945 (P,Q)	NEC
TR513	2SA 733 (P,Q)	NEC
TR514	2SA 733 (P,Q)	NEC
TR515	2SD 381 (K,L)	NEC
TR516	2SD 381 (K,L)	NEC
TR517	2SB 536 (K,L)	NEC
TR518	2SB 536 (K,L)	NEC
TR519	2SD 287 (A) or (C) (R,Q)	NEC
TR520	2SD 287 (A) or (C) (R,Q)	NEC
TR521	2SB 539 (A) or (C) (R,Q)	NEC
TR522	2SB 539 (A) or (C) (R,Q)	NEC
TR523	2SC 536 (H)	SANYO
TR524	2SC 536 (H)	SANYO
TR601	2SD 571 (K,L)	NEC
	or 2SC 2003 (K,L)	NEC
TR602	2SC 1399 (E,F)	NEC
TR603	2SA 733 (P,Q)	NEC
TR604	2SC 945 (P,Q)	NEC
TR605	2SC 945 (P,Q)	NEC
TR701	2SD 325 (E)	SANYO
TR702	2SD 325 (E)	SANYO
TR703	2SB 511 (E)	SANYO
TR1001	2SC 945 (P,Q)	NEC
TR1002	2SC 945 (P,Q)	NEC
TR1003	2SC 945 (P,Q)	NEC
TR1004	2SC 945 (P,Q)	NEC

VARIABLE RESISTORS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
VR201	Trimmer 50KΩB	P-6153	P-170037
VR202	Trimmer 1KΩB	P-6152	P-170036
VR203	Trimmer 5KΩB	P-6358	P-170070
VR204	Trimmer 50KΩB	P-6153	P-170037
VR205	Trimmer 100KΩB	P-6502	P-170035
VR206	Trimmer 100KΩB	P-6481	P-170237
VR401 /402	Potentiometer TREBLE 100 KB X 2	P-2069	P-170227
VR403 /404	Potentiometer BASS 100 KB X 2	P-2069	P-170227
VR405 /406	Potentiometer BALANCE 250K 1Z X 2	P-3068	P-170228
VR501	Trimmer 5KΩB	P-6358	P-170070
VR502	Trimmer 5KΩB	P-6358	P-170070
VR503	Trimmer 5KΩB	P-6358	P-170070
VR504	Trimmer 5KΩB	P-6358	P-170070
VR601	Trimmer 5KΩB	P-6358	P-170070
VR602	Trimmer 5KΩB	P-6358	P-170070
VR603	Trimmer 2KΩB	P-6501	P-170199
VR604	Trimmer 100ΩB	P-6254	P-170143
VR605	Trimmer 100ΩB	P-6254	P-170143
VR1101 /2/3/4 /5/6	Potentiometer VOLUME 200K 3B X 4 & 100K X 2		P-170339
VR1201	Trimmer 50KΩB	P-6500	P-170206
VR1202	Trimmer 50KΩB	P-6500	P-170206
VR1203	Trimmer 10KΩB	P-6351	P-170202

(26) EXPLODED VIEW PARTS LIST

Ref. No.	Description	R/S Part No.	Mfr's Part No.
1	Power Transformer	TA-0579	P-100384
2	Power Transformer Bracket	HB-5067	P-410940
3	Rectifier Bracket	HB-7697	P-411472
4	Rectifier (S 15VB)	DX-1040	
5	Lug type Electrolytic Capacitor (15000μF)		P-220025 or P-220029
6	Ground Board for Capacitors	HB-5069	P-410956
7	Rotary Switch	S-1226	P-180213
8	Reinforced Plate for Transformer		P-411054
9	Push Switch A	S-7282	P-180211
10	Push Switch B	S-0853	P-180297
11	Dial Scale Plate	D-5273	P-411084
12	Front Chassis	Z-2918	P-410931
13	Headphone Bracket	HB-5070	P-410932
14	Front Side Bracket (R)	HB-5071	P-410933
15	Front Side Bracket (L)	HB-5072	P-410934
16	Tuning Bracket	HB-5073	P-410942
17	Tuning Holder	HB-6376	P-411049
18	Dial Scale	G-0274	P-640144
19	Dial Side Bracket (R)	HB-5074	P-710095
20	Dial Side Bracket (L)	HB-5075	P-710096
21	Lever Switch Bracket	HB-5076	P-410935
22	Selector Panel Ass'y	Z-4076	P-700308
23	Tuning Meter Bracket	HB-5078	P-410943
24	Tuning Meter Spring	RB-5690	P-440100
25	Pointer Guide Ass'y	D-1191	P-450050
26	Tuning Shaft Ass'y	D-3206	P-420248
27	Tuning Collar	HB-5079	P-610577
28	Shield Plate for Push Switch	HB-5080	P-410936
29	Insulator for Shield Plate	HB-5088	P-690181
30	Sub-Pulley Bracket (A)	HB-5082	P-410944
31	Sub-Pulley Bracket (B)	HB-5083	P-410945
32	Sub-Pulley Bracket (C)	HB-5084	P-410946
33	Sub-Pulley Bracket (D)	HB-5085	P-410947
34	Sub-Pulley Bracket (E)	HB-5086	P-410948
35	Sub-Pulley Bracket (F)	HB-5087	P-410949
36	Sub-Pulley	D-0385	P-610471
37	Number Plate	HB-6879	P-730184
38	Dial Pulley	D-0288	P-610239
39	Dial Spring	RA-5847	P-440014
40	Hook		
41	Dial String		
42	Rubber		P-680136
43	Main Chassis (A) Ass'y		P-400196
44	Main Chassis (B)		P-400201
45	Main Chassis Side Board (R)		P-400197
46	Main Chassis Side Board (L)		P-400198
47	Chassis Supporter	HB-6375	P-411051
48	Snap Bushing	HB-5063	P-610430
49	Reinforced Board for Chassis	HB-5088	P-410952
50	Back Panel	Z-4078	P-411468
51	Back Panel Bracket	HB-5089	P-410938
52	Antenna Holder (A)	HB-6370	P-410138
53	Antenna Holder (B)	HB-6371	P-410139
54	Volume Control		P-170339
55	Headphone Jack	J-0444	P-190011
56	Watt Meter (R)	M-0312	P-230048
57	Watt Meter (L)	M-0313	P-230049
58	Tuning Meter	M-0314	P-230047
59	Temperature Protector	HB-6880	P-290018
60	Reflector Plate		P-410939
61	Protector Holder	HB-7684	P-411481
62	AC Cord		P-310090
63	AC Cord Stopper	HB-0598	P-480010
64	AC Outlet	J-6434	P-190098
65	Insulator Board	HB-6378	P-480148
66	Fuse Holder	HB-6378	P-260011
67	Relay Assembled P.C.B.	X-7238	U-25053
68	Bracket for Relay P.C.B.	HB-7685	P-411006Y
69	Protector & Meter Assembled P.C.B.	X-7754	U-23099
70	P.C.B. Supporter		
71	Tape Switch Assembled P.C.B.	X-7239	U-25052
72	Lamp P.C.B. (A)		P-200547
73	Front End Ass'y	X-7747	U-11018
74	AM/FM IF & MPX Assembled P.C.B.	X-7748	U-12041
75	Pre Amp Assembled P.C.B.	X-7750	U-14096
76	Tone Amp Assembled P.C.B.	X-7751	U-14097
77	Main Amp Assembled P.C.B.	X-7752	U-16075
78	Power Supply Assembled P.C.B.	X-7753	U-17055
79	Balun Coil	CA-2942	P-110012 or P-110098
80	Balun Coil P.C.B.	X-4972	P-200244
81	AM Bar Antenna	CA-0616	P-110065
82	4P Antenna Terminal Board		P-320218
83	14P Input Terminal Board	J-0965	P-190114
84	4P RCA Pin Terminal (MAIN IN-PRE OUT)	J-4473	P-190100
85	4P RCA Pin Terminal (SPEAKER)	J-4304	P-190041
86	DIN Jack	J-0747	P-190036 or P-190126
87	8P Speaker Terminal	J-4561	P-320215
88	GND Terminal	HD-1305	P-420284
89	Front Panel Ass'y	Z-4079	P-700307
90	Knob (197)(BASS & TREBLE)	K-2294	P-650197
91	Knob (198)(BASS & TREBLE)	K-2295	P-650198
92	Volume Knob (223)	K-2296	P-650223
93	Tuning Knob (199)	K-2301	P-650199
94	Selector and Balance Knob (196)	K-2297	P-650196
95	Push Knob (200)	K-2298	P-650200
96	Power Push Knob (202)	K-2299	P-650202
97	Lever Knob (201)	K-2300	P-650201
98	Blind Sheet for Push Switch	HB-5100	P-660126
99	Side Cabinet Bracket	HB-6373	P-411048
100	Side Cabinet (R)	Z-2922	P-620061
101	Side Cabinet (L)	Z-2923	P-620062
102	Top Cover with Ventilation Board	Z-3470	P-410926
103	Bracket for DOLBY P.C.B.	HB-7073	P-410609

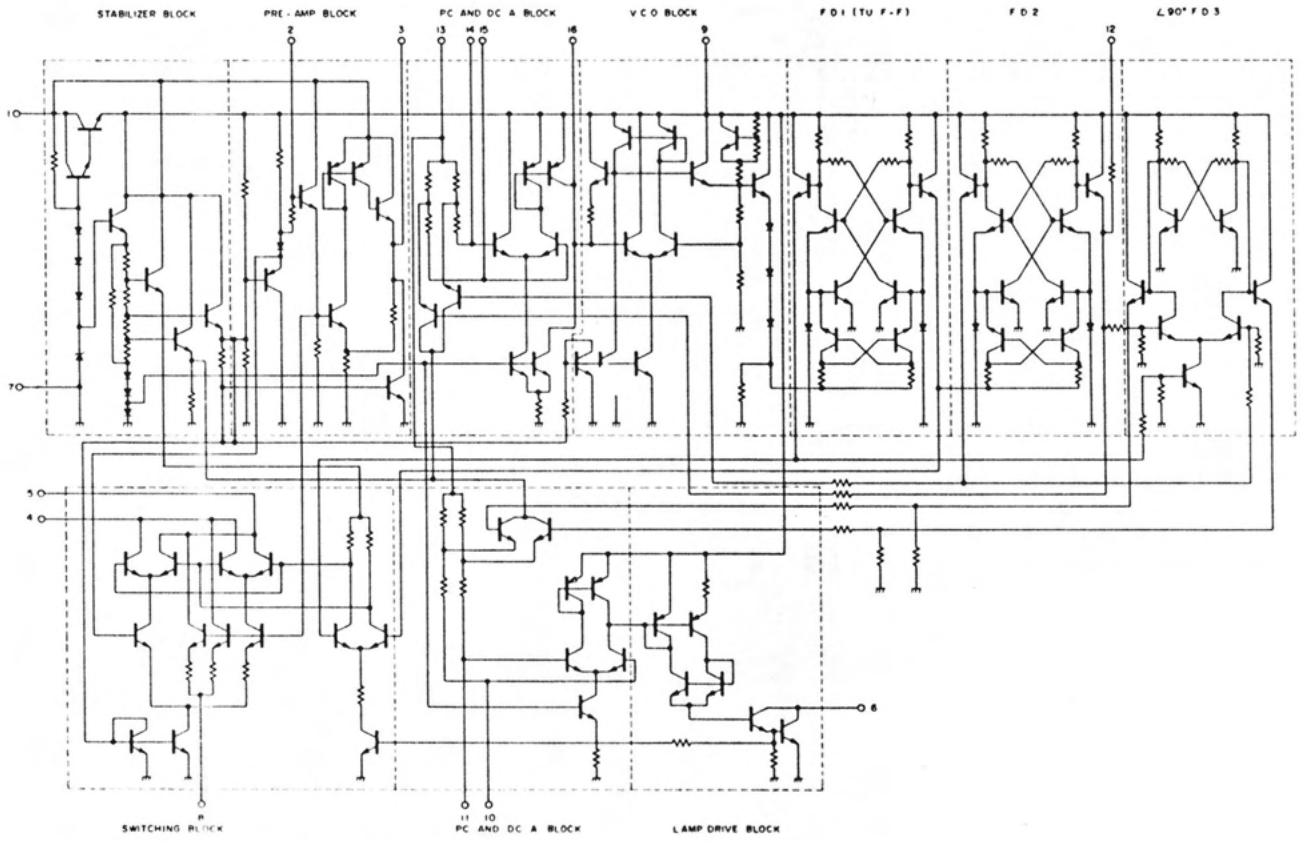
Ref. No.	Description	R/S Part No.	Mfr's Part No.
104	DOLBY Assembled P.C.B.	X-7749	U-25104
105	Screw Cover	HB-5105	P-610397
106	Lug Terminal (1L4P)	HB-5098	P-320093
107	Panel Bracket (R)	HB-5107	P-410927
108	Panel Bracket (L)	HB-5108	P-410928
109	Foot	F-0205	P-610428
110	Bottom Cover	Z-2924	P-410929
111	Cushion Seal for Top Cover (A)	HB-7686	P-480146
112	Cushion Seal for Top Cover (B)	HB-7687	P-480147
113	Lamp P.C.B. (small) (B)		P-200325
114	Wedge Lamp with Socket	L-0690	P-240076
115	Fuse Type Lamp	L-0864	P-240091
116	Fuse Type Lamp Holder	F-1013	P-260012
117	Lamp Cover	HB-2881	P-680091
118	Lamp Cover Plate	HB-7679	P-411467
119	Lamp with Lead	L-0717	P-240090
120	Dial Reflector	HB-5064	P-610429
121	Dial Reflector Plate	HB-5065	P-410951
122	Watt Meter Bracket	HB-5066	P-410954
123	Wire Stay	HB-5096	P-450049
124	Joint Pin	HB-5097	P-190105
125	Ground Lug		
126	Wire Holder		
127	Label for Transformer	HB-7680	P-810487

HARDWARE

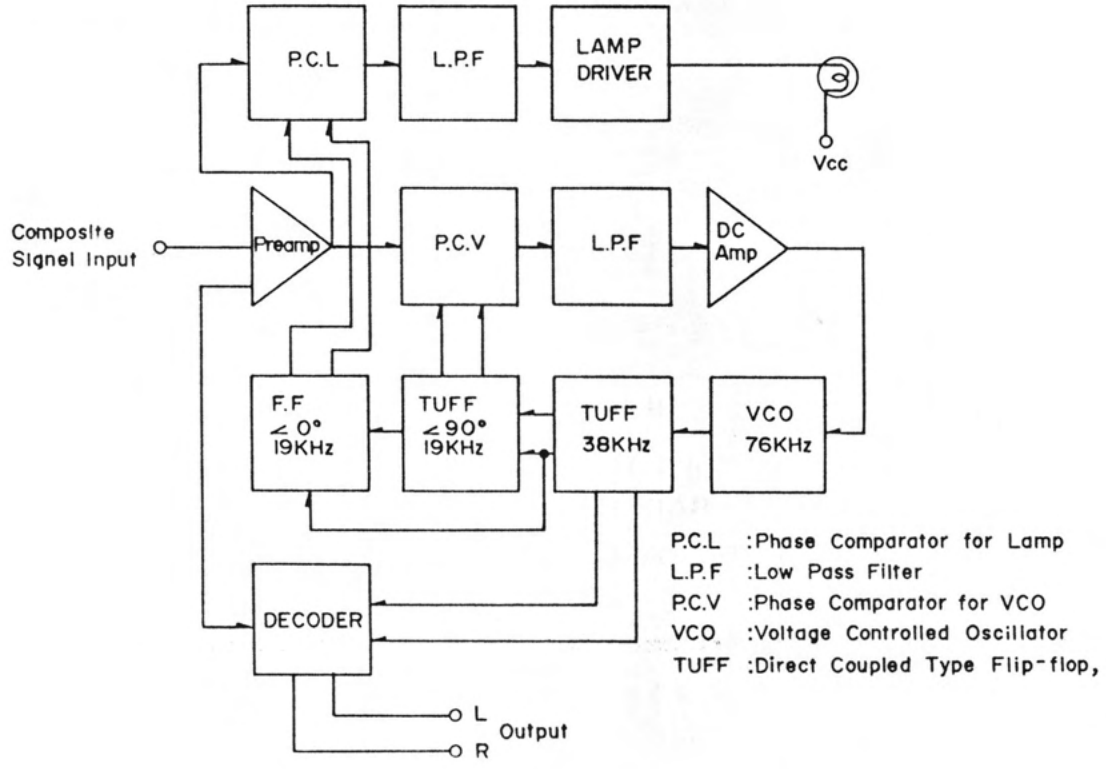
Ref. No.	Description	Mfr's Part No.
S 1	Screw 4 X 8 P	
S 2	Bind Tapping Screw 3 X 8 BT-2	
S 3	Tapping Tite Screw 4 X 20 BT-2	
S 4	Screw with Lock Washer Assembly 3 X 5 BT-2	
S 5	Bind Tapping Screw 3 X 5 BT-2	
S 6	Bind Tapping Screw 3 X 6 BT-2	
S 7	Screw with Spacer 3 X 9 X 3	P-420029
S 8	Screw with Lock Washer Assembly 3 X 8 P	
S 9	Screw (Black) 4 X 37 P	
S10	Screw (Black) 4 X 35 P	
S11	Screw with Spring Washer 3 X 6 P	
S12	Wood Screw 3 X 10 PW	
S13	Screw with Lock Washer Assembly (Black) 3 X 8 P	
S14	Screw with Lock Washer Assembly (Black) 4 X 20 P	
S15	Tapping Screw 4 X 16 BT-2	
S16	Screw with Lock Washer Assembly 4 X 8 P	
S17	Bind Tapping Screw 3 X 16 BT-2	
S18	Bind Tapping Screw 3 X 8 BT-2	
W 1	Washer 4W	
W 2	Toothed Lock Washer 4W	
W 3	Washer 3W	
W 4	Washer (Black) 4W	
SW1	Spring Washer 4SW	
N 1	Nut 4N	
N 2	Nut of Outside Cover (Black) 4N	
N 3	Nut 3N	
R 1	Blind Rivet (YB-429)	
R 2	Blind Rivet (YB-423)	
R 3	Blind Rivet (YB-340)	
R 4	Blind Rivet (YB-320) (Black)	

(27) IC INTERNAL DIAGRAMS (LA 1230, LA 3350 & HA 11226)

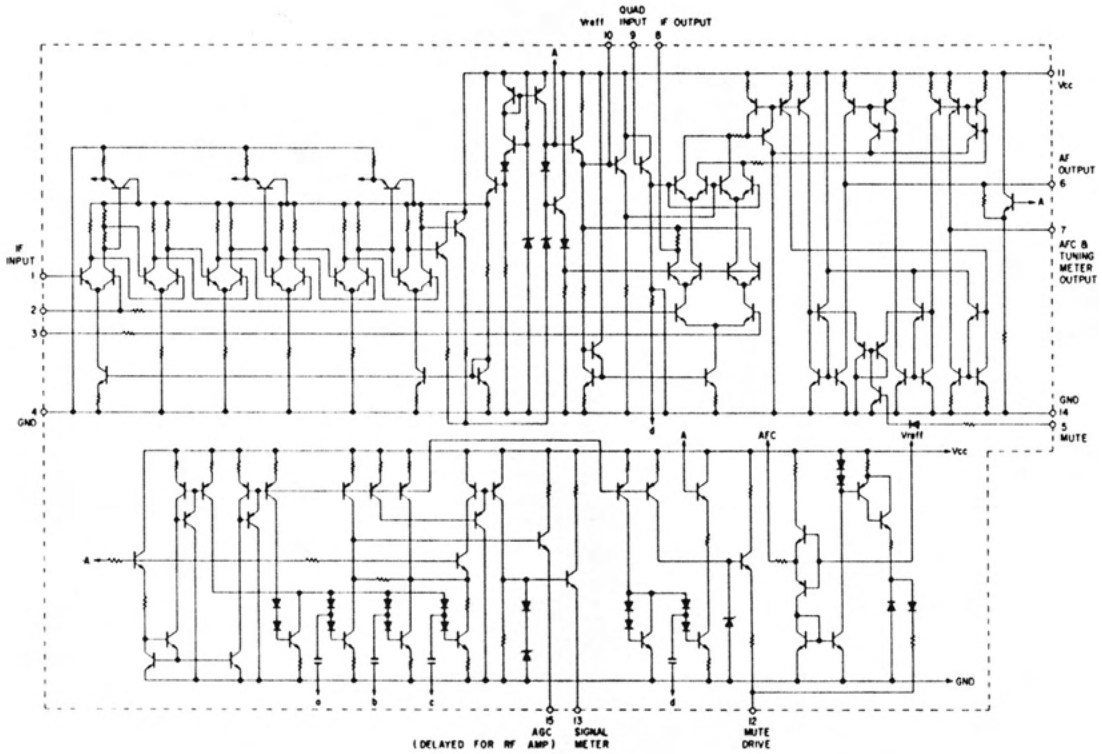
LA 3350



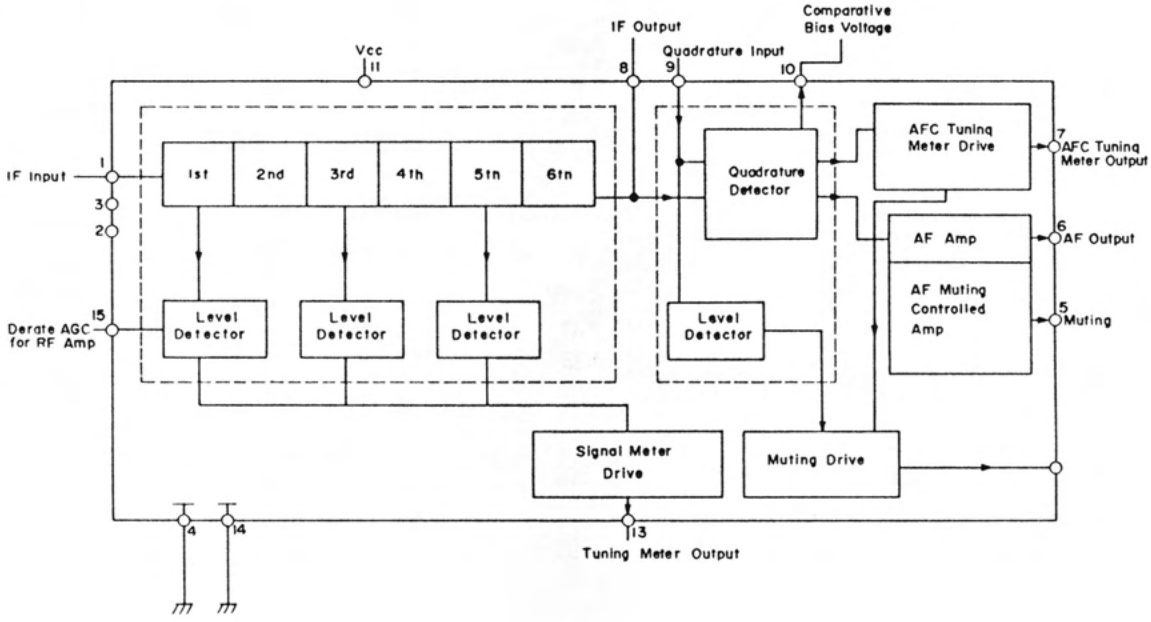
LA 3350 BLOCK DIAGRAM



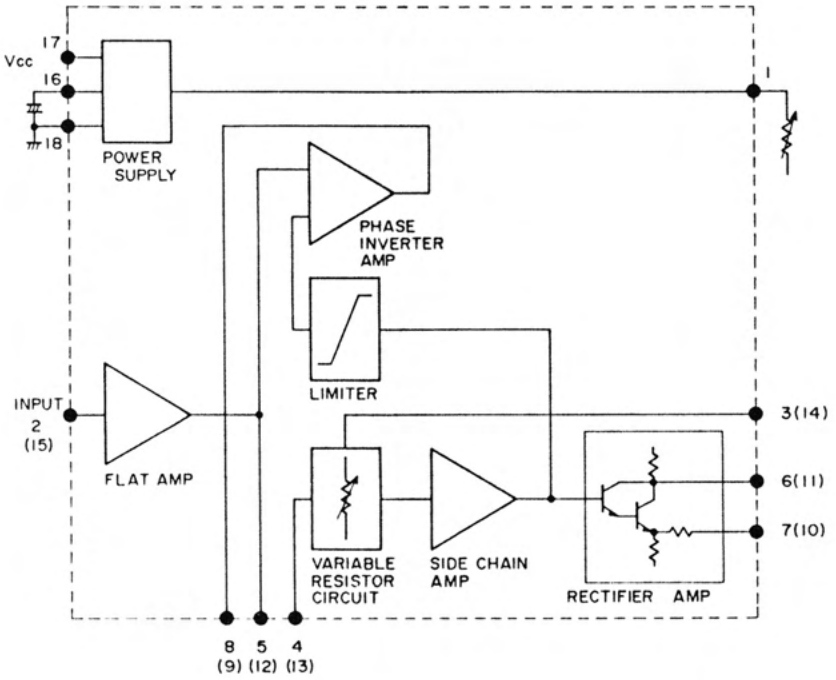
LA 1230



LA 1230 BLOCK DIAGRAM



HA 11226 BLOCK DIAGRAM



SCHEMATIC DIAGRAM

STA-2000D Cat. No. 31-2084

NOTE
1) SA-1~SA-10 SELECTOR SWITCH 1-AM, 2-FM, 3-PHONO, 4-AUX-1, 5-AUX-2.
2) ALL RESISTANCE VALUES ARE INDICATED IN "OHM" (K=10³OHM, M=10⁶OHM).
3) ALL CAPACITANCE VALUES ARE INDICATED IN "μF" (P=10⁻⁶ μF).

IN DOLBY FM UNIT,
1) NON-MARKED CAPACITORS & RESISTORS ARE OF ±5% TOLERANCE.
2) D1201/1202.....1N 34A or 1N 60P
   D1203/1204.....1S-2076

FRONT END
AM/FM IF & MPX
DOLBY FM
TONE AMP
PRE AMP
MUTING
TAPE S.W
MAIN AMP (Lch)
MAIN AMP (Rch)
PROTECTOR
METER CIRCUIT
POWER SUPPLY
HEADPHONE
SPEAKER
THERMAL PROTECTOR
USE FOR UL MODELS

EXPLODED VIEW