ALIGNMENT PROCEDURES

Do not attempt alignment unless the following equipment is available.

1. AM Signal Generator
2. Oscilloscope
3. AC Voltmeter
4. FM Signal Generator
5. Stereo Modulator
6. Audio Generator
7. Distortion meter
8. DC Voltmeter

Note: Remove line cord antenna from FM external antenna terminal when aligning.

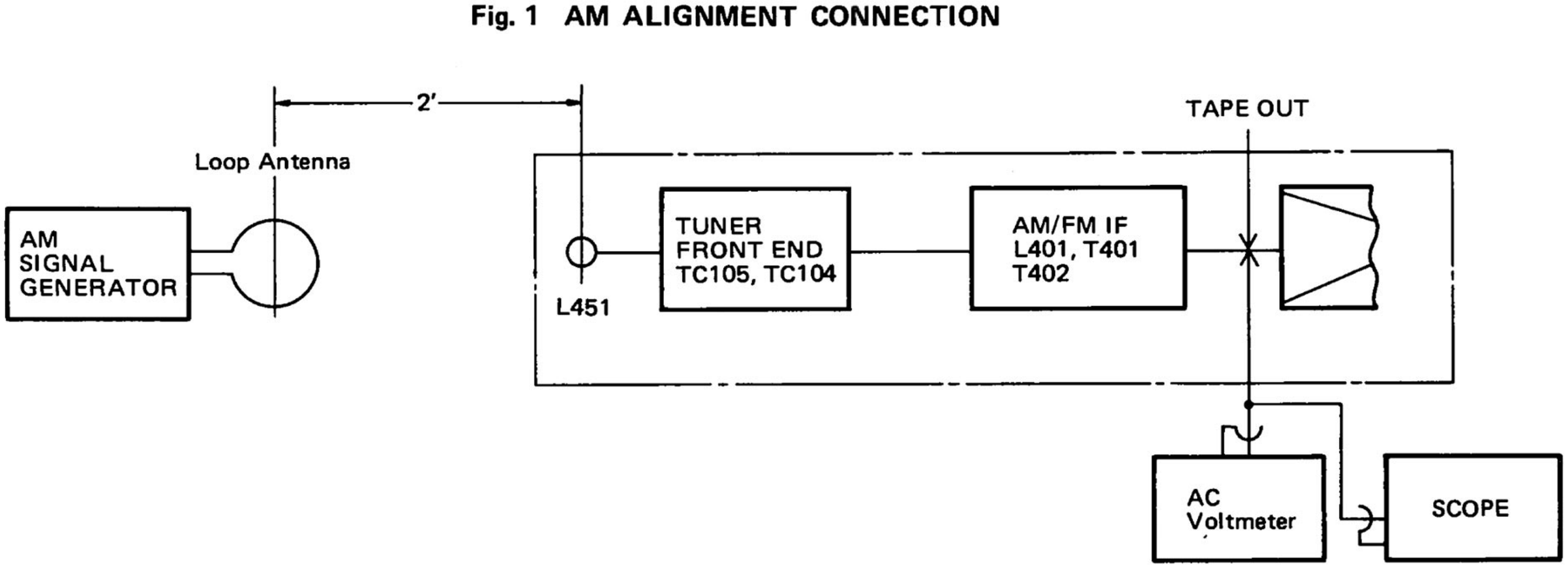
AM IF & ALIGNMENT

Output of signal generator should be no higher than necessary to obtain an output reading.
Set SELECTOR switch SW1 to AM.

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	INDICATOR	ADJUSTMENT Refer Fig. 4	REMARKS
1	Refer Fig. 1	455 kHz (400 Hz Mod.)	Point of non-interference. (on/about 600 kHz)	AC Voltmeter to TAPE OUT jack.	T401 (1st IFT) Both sections T402 (2nd IFT) Both sections	Adjust for maximum reading.
2	Same as Step 1	600 kHz (400 Hz Mod.)	600 kHz	Same as step 1	L401 (OSC Coil) L451 (ANT Coil)	Adjust for maximum reading.
3	Same as Step 1	1400 kHz (400 Hz Mod.)	1400 kHz	Same as step 1	TC104 (ANT Trimmer) TC105 (OSC Trimmer)	Adjust for maximum reading. Repeat steps.
4	Same as Step 1	1000 kHz (400 Hz Mod.)	1000 kHz	Same as step 1	VR401	Adjust for 160 mV Audio output.

Note: Remove line cord antenna from FM external antenna terminal when aligning.

Fig. 1 AM ALIGNMENT CONNECTION

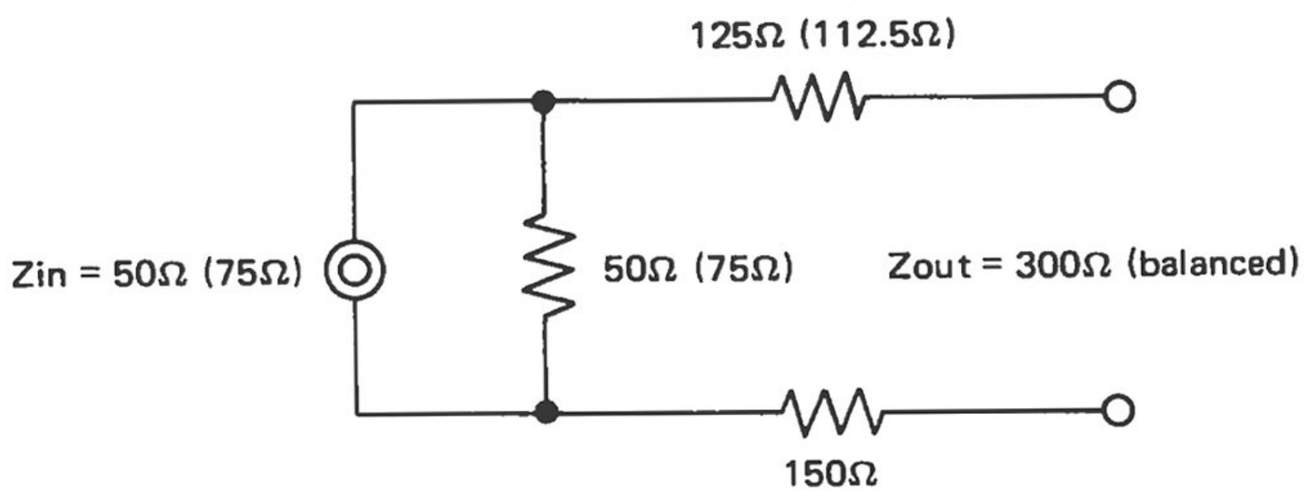


FM RF AND IF ALIGNMENT

Signal generator output should be no higher than necessary to obtain an output reading.
Set Selector switch to FM.
Signal Generator deviation: 75 kHz NOTE: Be sure to disconnect FM line cord antenna during alignment.

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	INDICATOR	ADJUSTMENT Refer Fig. 4	REMARKS
1	Connect to FM Antenna Terminal through FM Dummy Antenna (300Ω) Fig. 2	90 MHz	90 MHz	AC Voltmeter connected to TAPE OUT jack	L103 (FM OSC Coil) L101 (FM ANT Coil) L102 (FM RF Coil)	Adjust for maximum reading on AC Voltmeter
2	Same as Step 1	106 MHz (400 Hz, Mod.)	160 MHz	Same as Step 1	TC103 (FM OSC Trimmer) TC101 (FM ANT Trimmer) TC102 (FM RF Trimmer)	Adjust for maximum reading
Repeat steps 1 & 2 until no further inprovement is possible.						
3	Same as Step 1	90 MHz (400 Hz, Mod.)	90 MHz	Same as Step 1	T101 (FM IFT) T202 (FM IFT)	Adjust for maximum reading
4	Same as Step 1	90 MHz (400 Hz, Mod.)	90 MHz	TUNING Meter	T201 TOP (Discriminator)	Adjust for center point on TUNING meter
5	Same as Step 1	90 MHz (400 Hz, Mod.)	90 MHz	Distortion Meter connected to TAPE OUT jack	T201 Bottom	Adjust for minimum distortion
6	Same as Step 1	98 MHz (400 Hz, Mod.)	98 MHz	Stereo-Mono beacon lamp (for automatic switching)	VR201	Adjust so TR206 turns on, ("MUTE" on) with SG output level of 5μV

For European model, the lowest frequency of FM tuning range should not be below 87.5 MHz.



FM Dummy Antenna to 300Ω antenna terminal of Receiver.

Fig. 2 FM DUMMY ANTENNA

MPX ALIGNMENT

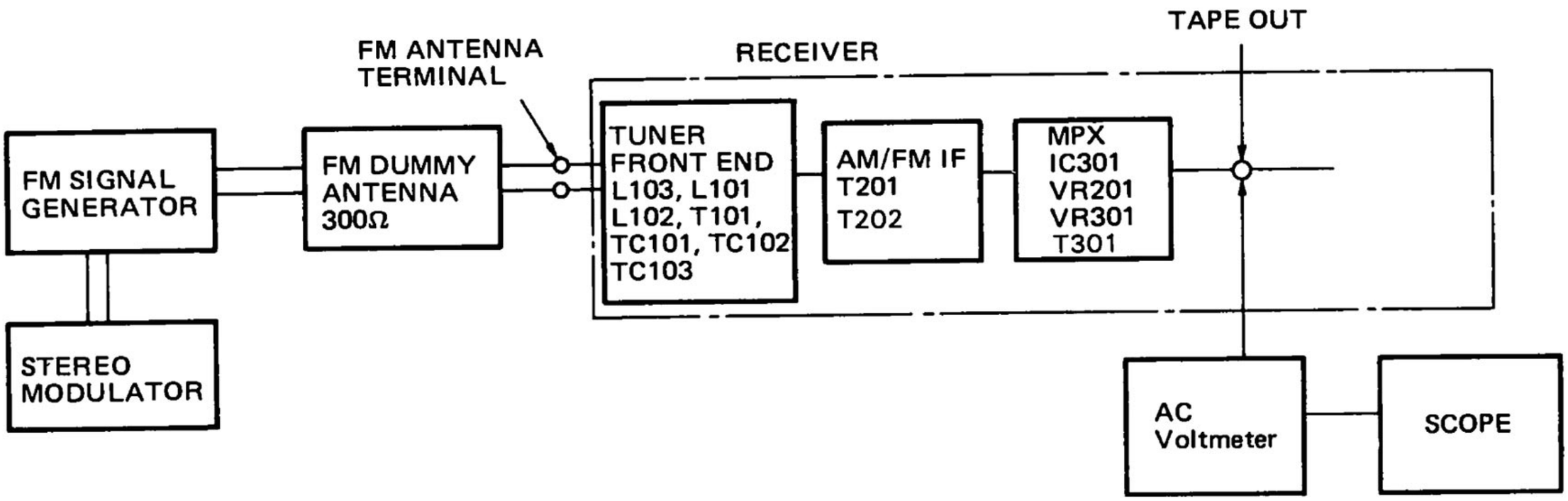


Fig. 3 MPX ALIGNMENT CONNECTION

Set SELECTOR Switch to FM.
Tune for 98 MHz on band.
Signal Generator output level:1000 μV Deviation: 75 kHz at 100% modulation of composite signal.
Connect Signal Generator to FM Antenna Terminal through FM Dummy Antenna (300Ω).

STEP	19 kHz (PILOT SIGNAL) MODULATION Level	SIGNAL GENERATOR Freq. Set to	OUTPUT INDICATOR Connected to	ADJUST Refer Fig. 4	ADJUST FOR	NOTE
1	3 ~ 4%	Stereo Modulator (Sub Signal) Pilot only	AC Voltmeter (Connect to pin #1 on IC301)	T301 (both sections)	Maximum	Stereo Beacon Lamp at max brilliance.
2	8%	Composite 1 kHz R channel	AC Voltmeter to TAPE OUT jack of R channel			Adjust input for audio output of about 0.9V.
3	8%	Composite 1 kHz L channel	AC Voltmeter to TAPE OUT jack	VR301	Minimum	AC Voltmeter reading should be at least 30 dB below reading in step 2.
4	8%	Composite 1 kHz R channel	AC Voltmeter to TAPE OUT jack of L channel	VR301	Minimum	Same as Step 3.

If you did not obtain −30 dB readings in steps 3 and 4 (compared with step 2), readjust VR301 until you obtain −30 dB reading for both steps 3 and 4.

MAIN AMPLIFIER ALIGNMENT

INDICATOR	ADJUSTMENT	REMARKS
DC Voltmeter	VR601a, b	Adjust for 0.005 V ~ 0.015 V across R620a, b with no signal

TROUBLESHOOTING

Symptom	Cause and Remedy
1) Receiver not operative; pilot lamp does not light.	A) Faulty AC power cord. Replace the cord. B) Defect in the power switch. Replace the switch. C) Broken wire in the power transformer. Replace the transformer. D) Broken power fuse. Replace the fuse.
2) Fuse blows when power is turned on.	A) Power Transformer T851 defective. Replace the transformer. B) Short in the primary or secondary of the transformer circuitry. Repair the short. C) Damaged rectifier D801, D802, D803, or D804. Replace the damaged rectifier. D) Short-circuit in the rectifier circuit. Repair the short. E) Short circuit in power transistor TR607a, b or TR608a, b. Replace the defective transistor and check circuit.
3) Pilot lamp does not light.	A) Defective lamp. Replace lamp. B) Disconnection in the transformer T851 tertiary winding. Replace the transformer.
4) Pilot lamp lights but no sound from either channels.	A) Resistor R802, R805, R806 open. Replace. B) Capacitor C808, C811, C852 or C853 defective. Replace the defective capacitor. C) Diode D801, D802, D803 or D804 damaged. Replace the damaged diode. D) Open in secondary winding of the power transformer T851. Replace the transformer. E) Transistor TR801, TR802 damaged (open). Replace the transistor. F) Diode D805 or D806 damaged. Replace the damaged diode.

Symptom	Cause and Remedy
5) "A" Speakers do not work.	A) Speaker switch SW8 defective. Replace the switch.
6) "B" Speakers do not work.	A) Speaker switch SW8 defective. Replace the switch.
7) One channel does not work with VOLUME at maximum, with a test signal applied to the center terminal of VOLUME control VR552 of the dead channel.	A) Defect in transistor TR901, TR902 or TR903 of AUDIO AMP BOARD 0031. Locate and correct the defect. B) Defect in transistor TR601, TR602, TR603, TR604, TR605, TR606, TR607, TR608, TR609 or TR610 of AUDIO AMP BOARD 0031. Locate and correct the defect. C) Break in copper foil of printed circuit board 0031. Repair or replace circuit board. D) Short in speaker output terminal. Repair the short. E) Defective resistor R902, R903, R904, R905 R906, R907, R915, R916, R917, R918, R602, R603, R604, R605, R607 or R608. Replace the defective resistor.
8) Same as 7 above but channel operates when test signal is applied as 7.	A) Defective transistor TR501 or TR502. Replace the defective transistor. B) Faulty resistor R502, R503, R504, R505, R506, R507, R508, R511 or R512. Replace the faulty resistor. C) Faulty capacitor C501, C502, C505 or C508. Replace the faulty capacitor. D) Defective selector switch SW1. Repair or replace the switch.
9) Speaker works normally but headphones do not work.	A) Headphone plug does not mate with jack. Replace the plug. B) Defective resistor R628a, b. Replace the resistor.
10) All the inputs work normally except AUX input.	A) Poor contact in AUX input jack. Repair or replace the jack. B) Poor contact in selector switch SW1. Repair or replace the switch.
11) PHONO input not operative.	A) Poor contact in PHONO input jack. Repair or replace the jack. B) Faulty selector switch SW1. Repair or replace the switch.

Symptom	Cause and Remedy
12) TAPE MONITOR OUT not operative.	A) Defective contact in TAPE MONITOR OUT jack. Repair or replace the jack.
13) FM does not operate.	A) Defective diode D807. Replace the diode. B) Transistor TR801 damaged (open). Replace. C) Defective resistor R802. Replace the resistor. D) Short-circuit in TUNER B– circuit. Repair the short. E) Poor contact in selector switch SW1. Repair or replace the switch. F) Resistor R301 defective. Replace the resistor. G) Capacitor C301 defective. Replace the capacitor. H) Defective transistor TR201, TR202, TR203 or IC IC201, IC202. Replace the defective transistor or IC. I) Defective IFT T201. Replace the IFT. J) Defective resistor R203, R207, R209, R213, R218, R219. Replace the defective resistor. K) Defective capacitor C201, C216. Replace the defective capacitor. L) Defective transistor TR101, TR102, TR103 or coil L101, L103 of tuner board 0001. Replace the defective component. M) Faulty lead-in. Repair or replace the lead in.
14) Poor multiplex separation.	A) Improper adjustment. Readjust T201, VR301 and VR201. (Refer to MPX ALIGNMENT on page 9.) B) TR204, TR205, TR206, TR207, TR208, TR209, TR210 or IC301 of TUNER Board 0001 defective. Replace the defective component. C) Variable resistor VR201, VR301 defective. Replace the variable resistor.

Symptom	Cause and Remedy
15) Stereo indicator lamp does not light.	A) Defective indicator lamp PL14. Replace the lamp. B) Improper adjustment of VR201 of TUNER Board 0001. Make readjustment. (Refer to MPX ALIGNMENT on Page 9.) C) Defective IC IC301 or Resistor R810 of AUDIO AMP Board 0031. Replace the defective component. D) Defective diode D812. Replace the diode. E) Capacitor C815 defective. Replace the capacitor.
16) FM volume not sufficient.	A) If volume of both L and R channels not enough: Front End defective, or faulty transistor TR203, IFT T201 or diode D207, D208 of TUNER Board 0001 or faulty C302, IC301 of TUNER Board 0001. Locate and replace the defective component. B) If sound of one channel not enough: Defective L301 (Board 0001) in case of R Channel, or defective L302 (Board 0001) in case of L channel. Replace the defective coil.
17) AM does not operate.	A) Damaged IC202 of TUNER Board 0001. Replace the IC. B) Defective L401, T401 or T402 of TUNER Board 0001. Replace the defective component. C) Defective diode D401 of TUNER Board 0001. Replace the diode. D) One of resistors of TUNER Board 0001 defective. Replace the defective one. E) One of capacitors of TUNER Board 0001 defective. Replace the defective one. F) Selector switch SW1 defective. Repair or replace the switch. G) Defective Tuning Gang. Replace Tuning Gang. H) Damaged AM bar antenna. Repair or replace bar antenna.

Symptom	Cause and Remedy
18) LOUDNESS has no effect.	A) Defective LOUDNESS switch SW5. Replace the switch. B) Defective C917, C918 or R927. Replace defective component. C) Defective Volume control VR552. Replace.
19) STEREO-MONO not effective.	A) Defective STEREO-MONO switch SW4. Replace the switch.
20) TAPE MON not effective.	A) Defective TAPE MONITOR switch SW2 or SW3. Replace the switch. B) Poor contact in TAPE MON input jacks. Repair or replace jack.
21) BASS control has no effect.	A) VR 951 defective. Replace. B) Defective C907, C908, R912, R913 or R914 of AUDIO AMP Board 0031. Replace defective component.
22) TREBLE control has no effect.	A) VR952 defective. Replace. B) Defective C906, R909 or R910, R911 of AUDIO AMP Board 0031. Replace the defective component.
23) Excessive noise with PHONO (MAG) input.	A) Faulty TR501 or TR502. Replace the faulty transistor. B) Faulty R501, R503, R506 or C501. Replace the faulty component.
24) Noisy VOLUME control.	A) Defective VR552. Replace the variable resistor. B) Defective capacitor C505 or C901. Replace the defective capacitor.
25) SIGNAL STRENGTH meter not functioning.	A) Defective meter. Replace. B) In case of FM reception, R238, R239, C211 or C213 defective. Replace the defective component. C) In case of AM reception, resistor R408 defective. Replace the defective component.

Symptom	Cause and Remedy
26) TUNING Meter not functioning.	A) Defective Meter. Replace the meter. B) Resistor R211 defective. Replace the resistor.
27) QUATRAVOX not effective.	A) Defective switch SW8. Replace the switch.
28) FILTER LO has no effect.	A) Defective switch SW6. Replace the switch. B) Defective capacitor C912. Replace the capacitor.
29) FILTER HI has no effect.	A) Defective switch SW7. Replace the switch. B) Defective resistor R920 or capacitor C913. Replace the defective component.

NOTE: 1. This Receiver has built-in over load thermal protection for abnormal operation.
When the temperature of thermal protector (installed with heat sink) does rise abnormally (90±5°C), the thermal protector will automatically cut out, and as soon as the temperature goes down sufficiently (35±15°C), the thermal protector turns back on automatically.
If the Receiver does turn itself off, check ventilation and speaker connections.

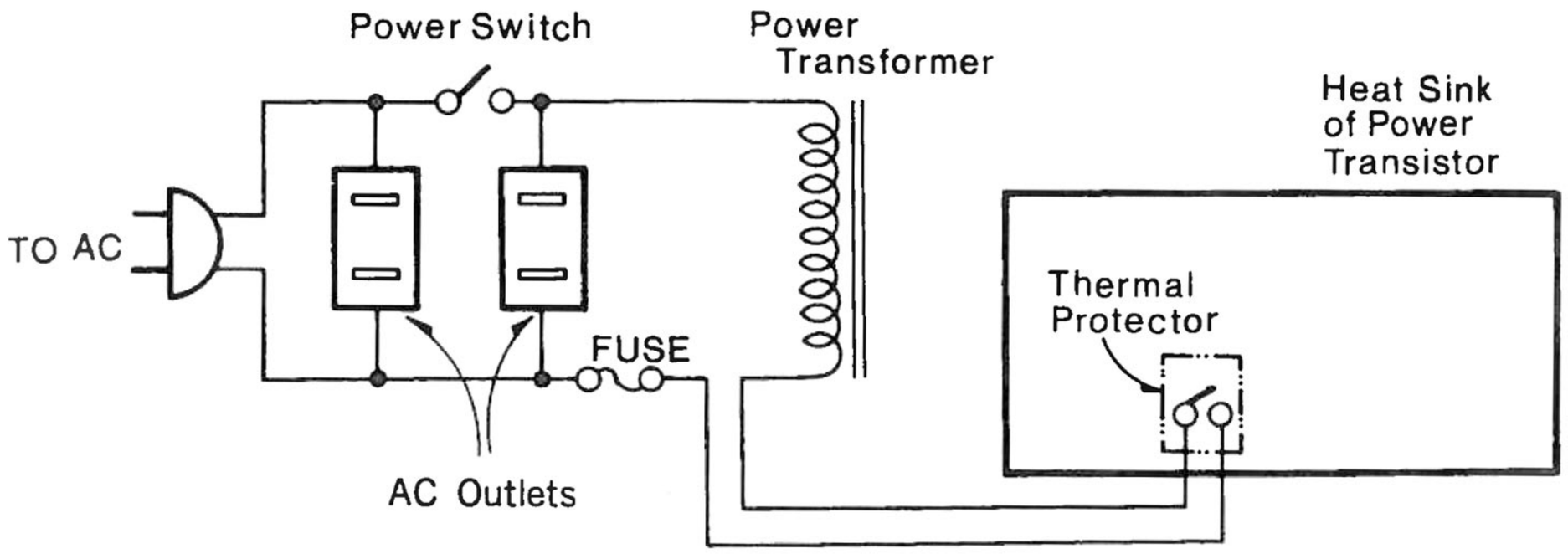


Figure 5

2. Transistors TR609 and TR610 protect audio output stage when abnormally high current flows on TR607 and TR608 caused by excessively driven at input, or too low impedance load is connected at output.
If increase of the current is excessive, the voltage across R620 and R621 will turn on TR609 and TR610 which are normally not biased and collectors of these transistors through D602 and D603 diodes reduce biases on TR605 and TR606 which causes output transistors TR607 and TR608 to reduce the current.
This occurs first to protect not only the circuit but also the speakers connected on output terminals against loud clicks and pop noises.

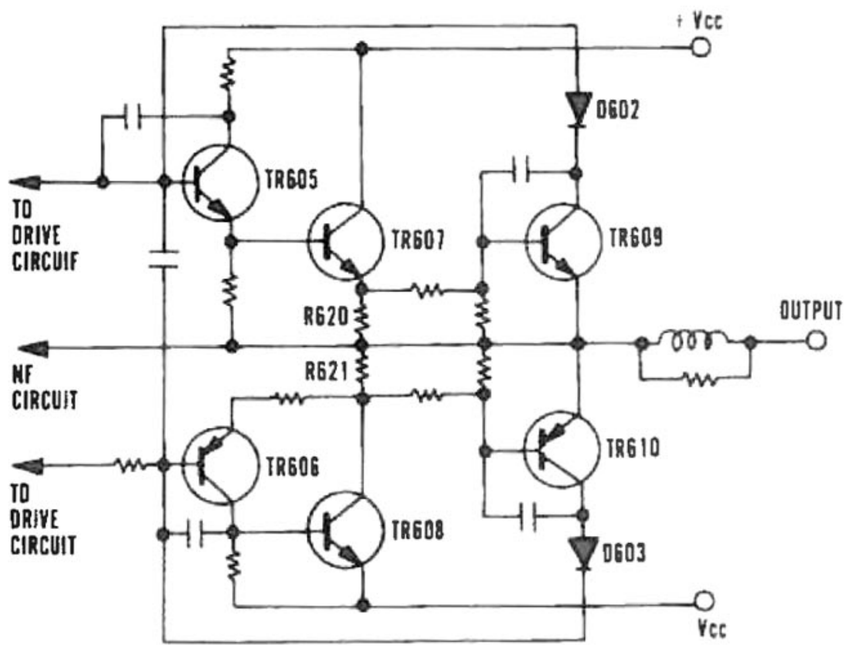
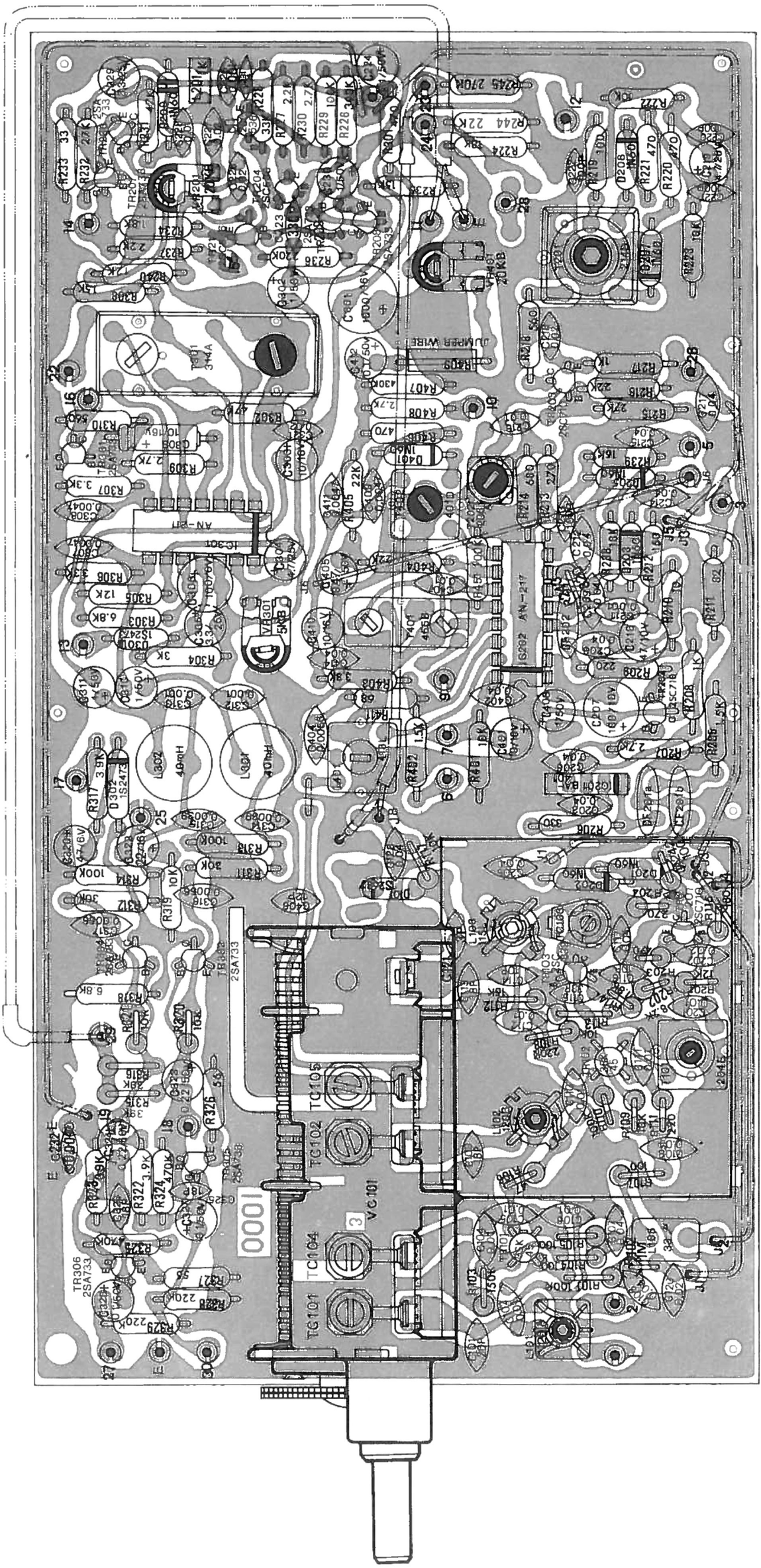
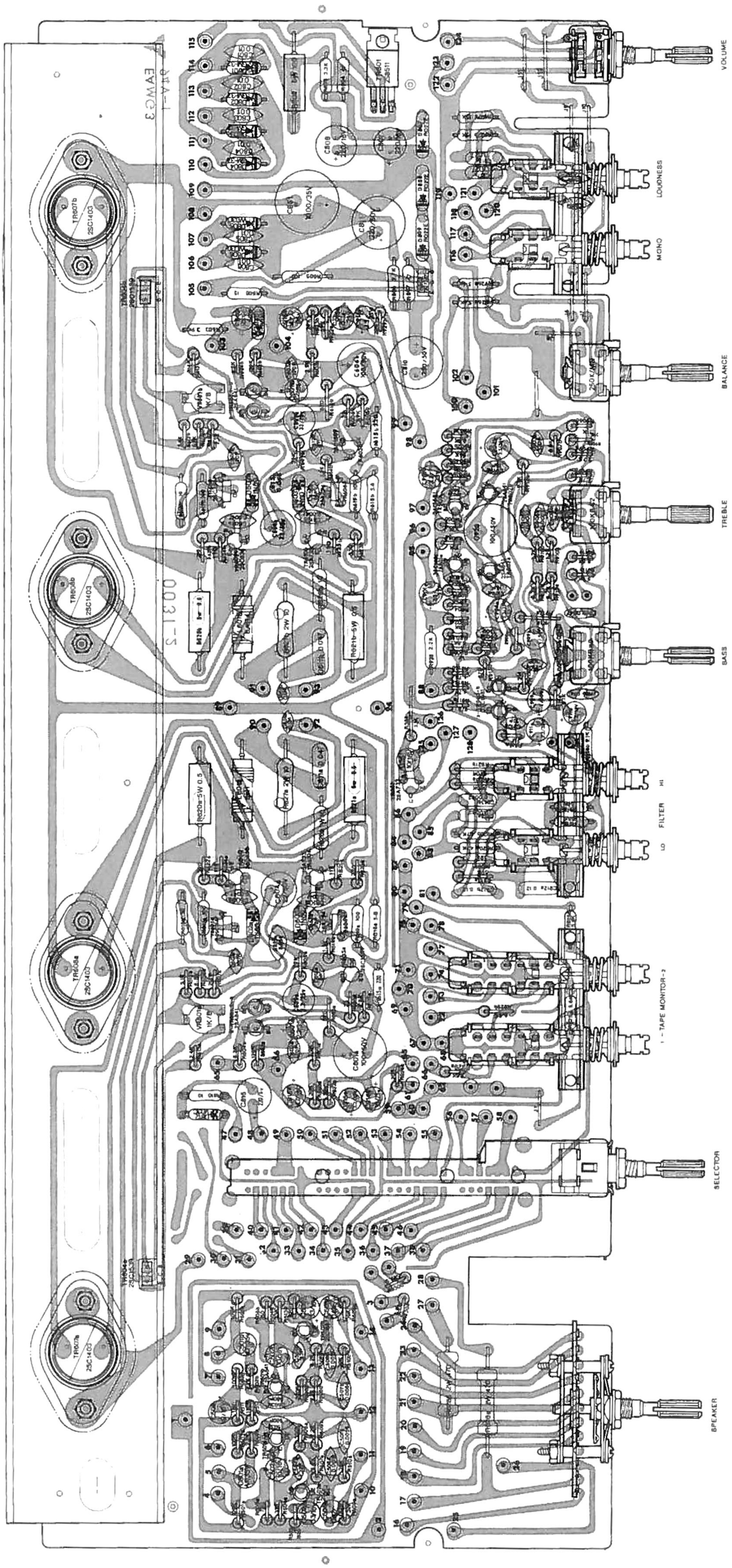


Figure 6

0001 TUNER BOARD (TOP VIEW)



0031 AUDIO AMP BOARD (TOP VIEW)



ELECTRICAL PARTS LIST

CAPACITORS

Ref. No.	Value (F)	Volt-age	Tolerance (%)	Material
C101	20P	50	±10	Ceramic
C102	0.01μ	25	±10	Ceramic
C103	0.04μ	25	±10	Ceramic
C104	0.01μ	25	±10	Ceramic
C105	0.01μ	25	±10	Ceramic
C106	0.01μ	25	±10	Ceramic
C107	0.04μ	25	±10	Ceramic
C108	0.04μ	25	±10	Ceramic
C109	18P	50	±10	Ceramic
C110	0.01μ	25	±10	Ceramic
C111	0.01μ	25	±10	Ceramic
C112	0.01μ	25	±10	Ceramic
C113	18P	50	±5	Ceramic
C114	10P	50	±5	Ceramic
C115	33P	50	±5	Ceramic
C116	10P	50	±5	Ceramic
C117	0.04μ	25	±10	Ceramic
C118	Not Used			
C119	Not Used			
C120	0.02μ	25	±10	Ceramic
C121	3P	50	±5	Ceramic
C122	Not Used			
C123	0.04μ	25	±10	Ceramic
C201	0.01μ	25	±10	Ceramic
C202	0.02μ	25	±10	Ceramic
C203	0.04μ	25	±10	Ceramic
C204	33P	50	±10	Ceramic
C205	0.04μ	25	±10	Ceramic
C206	0.04μ	25	±10	Ceramic
C207	100 μ	10	+50 −10	Electrolytic
C208	0.04μ	25	±10	Ceramic
C209	0.04μ	25	±10	Ceramic
C210	47μ	10	+50 −10	Electrolytic
C211	1000P	50	±10	Ceramic
C212	0.04μ	25	±10	Ceramic
C213	100P	50	±10	Ceramic
C214	0.04μ	25	±10	Ceramic
C215	0.04μ	25	±10	Ceramic
C216	0.01μ	25	±10	Ceramic
C217	0.04μ	25	±10	Ceramic
C218	0.02μ	25	±10	Ceramic
C219	4.7μ	25	+75 −10	Electrolytic
C220	100P	50	±10	Ceramic
C221	100P	50	±10	Ceramic
C222	100P	50	±10	Ceramic
C223	330P	50	±10	Ceramic
C224	1μ	50	+75 −10	Electrolytic
C225	1000P	50	±10	Ceramic
C226	0.02μ	25	±10	Ceramic
C227	0.02μ	25	±10	Ceramic
C228	0.01μ	25	±10	Ceramic
C229	3.3μ	25	+75 −10	Electrolytic
C230	1μ	50	+75 −10	Electrolytic
C231	0.04μ	25	±10	Ceramic
C232	0.04μ	25	±10	Ceramic
C251	0.04μ	25	±10	Ceramic
C252	220μ	16	+50 −10	Electrolytic
C301	1000μ	10	+50 −10	Electrolytic
C302	1μ	50	+50 −10	Electrolytic
C303	10μ	16	+50 −10	Electrolytic
C304	4.7μ	25	+75 −10	Electrolytic
C305	3.3μ	25	+75 −10	Electrolytic
C306	100μ	6	+50 −10	Electrolytic
C307	4700P	50	±10	Ceramic
C308	4700P	50	±10	Ceramic
C309	10μ	16	+50 −10	Electrolytic
C310	1μ	50	+75 −10	Electrolytic
C311	1μ	50	+75 −10	Electrolytic
C312	1000P	50	±10	Ceramic
C313	1000P	50	±10	Ceramic
C314	3900P	50	±10	Ceramic
C315	3900P	50	±10	Ceramic
C316	5600P	50	±10	Ceramic
C317	5600P	50	±10	Ceramic
C318	Not Used			
C319	Not Used			
C320	47μ	6	+50 −10	Electrolytic
C321	0.02μ	25	±10	Ceramic
C322	22μ	16	+50 −10	Electrolytic
C323	0.22μ	50	+75 −10	Electrolytic
C324	0.22μ	50	+75 −10	Electrolytic
C325	18P	50	±10	Ceramic
C326	18P	50	±10	Ceramic
C327	0.1μ	50	+75 −10	Electrolytic
C328	0.1μ	50	+75 −10	Electrolytic
C351	10μ	16	+50 −10	Electrolytic

Ref. No.	Value (F)	Volt-age	Tolerance (%)	Material
C401	10μ	16	+50 −10	Electrolytic
C402	0.04μ	25	±10	Ceramic
C403	1μ	50	+75 −10	Electrolytic
C404	5600P	50	±10	Ceramic
C405	0.47μ	50	+75 −10	Electrolytic
C406	12P	50	±10	Ceramic
C407	0.01μ	25	±10	Ceramic
C408	Not Used			
C409	4700P	50	±10	Ceramic
C410	10μ	16	+50 −10	Electrolytic
C411	4700P	50	±10	Ceramic
C412	0.1μ	50	+75 −10	Electrolytic
C413	Not Used			
C414	0.04μ	25	±10	Ceramic
C415	3P	50	±10	Ceramic
C451	47μ	6	+50 −10	Electrolytic
C501a,b	4.7μ	35	+75 −10	Electrolytic
C502a,b	10 μ	16	+50 −10	Electrolytic
C503a,b	680P	50	±10	Ceramic
C504a,b	33P	50	±10	Ceramic
C505a,b	0.47 μ	50	+75 −10	Electrolytic
C506a,b	1800P	50	±10	Ceramic
C507a,b	5600P	50	±10	Ceramic
C508	10μ	16	+50 −10	Electrolytic
C509a,b	33μ	16	+50 −10	Electrolytic
C551a,b	0.002μ	50	±10	Ceramic
C552a,b	0.002μ	50	±10	Ceramic
C601a,b	2.2μ	35	+75 −10	Electrolytic
C602a,b	120P	50	±10	Ceramic
C603	0.1μ	50	+75 −10	Electrolytic
C604a,b	22μ	50	+50 −10	Electrolytic
C605a,b	33μ	25	+50 −10	Electrolytic
C606a,b	100μ	50	+50 −10	Electrolytic
C607a,b	120P	50	±10	Ceramic
C608a,b	Not Used			
C609a,b	4700P	50	±10	Ceramic
C610a,b	4700P	50	±10	Ceramic
C611a,b	0.047μ	50	±10	Polyester
C612a,b	8P	50	±10	Ceramic
C613a,b	0.056μ	50	±10	Polyester
C651a,b	Not Used			
C652a,b	18P	50	±10	Ceramic
C653a,b	0.01μ	50	±10	Polyester

Ref. No.	Value (F)	Volt-age	Tolerance (%)	Material
C751	47μ	16	+50 −10	Electrolytic
C752	22μ	16	+50 −10	Electrolytic
C801	0.01μ	500	±10	Ceramic
C802	0.01μ	500	±10	Ceramic
C803	0.01μ	500	±10	Ceramic
C804	0.01μ	500	±10	Ceramic
C805	0.01μ	500	±10	Ceramic
C806	0.01μ	500	±10	Ceramic
C807	220μ	16	+50 −10	Electrolytic
C808	220μ	16	+50 −10	Electrolytic
C809	Not Used			
C810	220μ	50	+50 −10	Electrolytic
C811	220μ	50	+50 −10	Electrolytic
C812	Not Used			
C813	Not Used			
C814	Not Used			
C815	220μ	6	+50 −10	Electrolytic
C851	1000μ	35	+50 −10	Electrolytic
C852	8000μ	50	+50 −10	Electrolytic
C853	8000μ	50	+50 −10	Electrolytic
C854	0.0047μ	250	±10	Polyester
C855	0.0047μ	250	±10	Polyester
C901a,b	3.3μ	25	+75 −10	Electrolytic
C902a,b	680P	50	±10	Ceramic
C903a,b	330P	50	±10	Ceramic
C904a,b	3.3μ	25	+75 −10	Electrolytic
C905a,b	180P	50	±10	Ceramic
C906a,b	2700P	50	±10	Ceramic
C907a,b	0.047μ	50	±10	Polyester
C908a,b	0.047μ	50	±10	Polyester
C909a,b	1μ	50	+75 −10	Electrolytic
C910a,b	10P	50	±10	Ceramic
C911a,b	2.2μ	35	+75 −10	Electrolytic
C912a,b	0.12μ	50	±10	Polyester
C913a,b	8200P	50	±10	Polyester
C914a,b	3.3μ	25	+75 −10	Electrolytic
C915a,b	3.3μ	25	+75 −10	Electrolytic
C916a,b	4.7μ	35	+75 −10	Electrolytic
C917a,b	0.027μ	50	±10	Polyester
C918a,b	120P	50	±10	Ceramic
C919a,b	18P	50	±10	Ceramic
C920	100μ	50	+50 −10	Electrolytic

CERAMIC FILTERS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
CF201a,b	SFE10.7 MA-8	C-0638	35300012
CF202	SFE10.7 MA-8	C-0638	35300012

DIODES

Ref. No.	Type No.	R/S Part No.	Part No.	Manufacturer
D101	1S2687		30600560	JRC
D201	1N60P		30600011	UNISON
D202	1N60P		30600011	UNISON
D203	1N60P		30600011	UNISON
D204	Not Used			
D205	1N60P		30600011	UNISON
D206	Not Used			
D207	1N60P		30600011	UNISON
D208	1N60P		30600011	UNISON
D209	1N60		30600010	UNISON
D301	1S2473		30600410	Toyo Electronics
D302	1S2473		30600410	Toyo Electronics
D401	1N60P		30600011	UNISON
D601	RD16E-B		30600620	NEC
D602a,b	1N60		30600010	UNISON
D603a,b	1N60		30600010	UNISON
D801	GM-3Z		30600891	Sanken
D802	GM-3Z		30600891	Sanken
D803	GM-3Z		30600891	Sanken
D804	GM-3Z		30600891	Sanken
D805	W03C		30600871	Hitachi
D806	W03C		30600871	Hitachi
D807	RD12E-B		30600650	NEC
D808	RD22E-B		30600771	NEC
D809	RD22E-B		30600771	NEC
D810	Not Used			
D811	Not Used			
D812	W03C		30600871	Hitachi

INTEGRATED CIRCUITS

Ref. No.	Type No.	R/S Part No.	Mfr's Part No.	Manufacturer	Substitute	
					Type No.	Manufacturer
IC201	BA-401		30900230	Toyo Electronics	TA7060	Hitachi
IC202	AN-217		30900170	Matsushita		
IC301	AN-211		30900180	Matsushita		

COILS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
L101	FM Ant. Coil 120A	CA-3413	35501201
L102	FM RF Coil 120B	CA-4551	35501202
L103	FM OSC Coil 115L	CA-4674	35501156
L104	Not Used		
L105	Choke Coil 144LY 33 μH	CA-3100	35500160
L201	Inductor 144LY-102K	CA-2936	35500150
L301	Choke Coil 40 mH	CB-2271	35500250
L302	Choke Coil 40 mH	CB-2271	35500250
L401	AM OSC Coil 413L	CA-4675	35504136
L451	AM Bar Antenna Coil	CA-0259	35400381
L601a,b	Choke Coil 8 μH	CB-2244	35500170

METERS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
M1	SIGNAL	M-0278	60200014
M2	TUNING	M-0279	60100016

PILOT LAMPS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
PL1	8V, 250mA (for SIGNAL meter)		37008019
PL2	8V, 250mA (for TUNING meter)		37008019
PL3	8V, 250mA (Dial Lamp)		37008019
PL4	8V, 250mA (Dial Lamp)		37008019
PL5	8V, 250mA (Dial Lamp)		37008019
PL6	8V, 250mA (Dial Lamp)		37008019
PL7	8V, 250mA (Dial Lamp)		37008019
PL8	8V, 100mA (Function Indicator)		37008033
PL9	8V, 100mA (Function Indicator)		37008033
PL10	8V, 100mA (Function Indicator)		37008033
PL11	8V, 100mA (Function Indicator)		37008033
PL12	8V, 100mA (Function Indicator)		37008033
PL13	6V, 65mA (Dial Pointer)	D-1165	25040001
PL14	6V, 65mA (Dial Pointer)	D-1165	25040001

PRINTED CIRCUIT BOARDS (ASSEMBLED)

Ref. No.	Description	R/S Part No.	Mfr's Part No.
0001	Tuner Board	C-4546	97001101
0031	Audio Amplifier Board	X-4983	97031101
7106	Dial Lamp Board	X-4984	97710610
7107	Meter Lamp Board	X-4985	97710710
7108	Function Indicator Lamp	X-4986	97710810

SWITCHES

Ref. No.	Description	R/S Part No.	Mfr's Part No.
SW1	SELECTOR	S-0711	27100112
SW2	TAPE MONITOR 1	S-0713	27200069
SW3	TAPE MONITOR 2	S-0713	27200069
SW4	MONO	S-7256	27200068
SW5	LOUDNESS	S-7256	27200068
SW6	FILTER-LO	S-7256	27200068
SW7	FILTER-HI	S-7256	27200068
SW8	SPEAKERS	S-0712	27100113
SW9	POWER	S-0714	28000107
SW10	THERMAL PROTECTOR 90C	S-0647	30700160

TRANSFORMERS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
T101	FM IFT 204E	CA-7070	35702045
T201	FM IFT 214D	CA-7358	35702144
T202	FM IFT 206A (Discriminator)	CA-7569	35702061
T301	MPX Coil 314A	CB-0148	35603141
T401	Ceramic IFT CFT 455B	C-0547	35704061
T402	AM IFT 401D	CA-7073	35704014
T851	Power Transformer (UL)	TA-0528	35900181
T851	Power Transformer (CSA)		35900183

VARIABLE CAPACITORS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
VC101	Tuning Capacitor (includes TC101, TC102, TC104 and TC105)	C-4547	26250101
TC103	Trimmer 10PF	C-0424	26010023

VARIABLE RESISTORS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
VR201	Auto-Stereo & Muting Sensitivity 20KΩ/B	P-1605	28100075
VR301	MPX Separation 5KΩ/B	P-1604	28100060
VR401	AM Audio Output Level 20KΩ/B		28100075
VR551a,b	BALANCE Control 250KΩ/MN	P-3057	28000108
VR552a,b	VOLUME Control 250KΩ/B	P-1606	28000107
VR601a,b	Idling Current 1KΩ/B	P-1609	28100059
VR951a,b	BASS Control 100KΩ/B	P-2058	28000109
VR952a,b	TREBLE Control 100KΩ/B	P-2058	28000109

#0001 TUNER BOARD

FM ANT. 300Ω / 75Ω

AM ANT.

TO TUNER IN R ch

TO TUNER IN L ch

MONO

#0031 AUDIO AMP BOARD

TO PIN #30

TUNER IN L ch

TUNER IN R ch

TO PIN #27

LEFT CHANNEL

PHONO

AUX

TAPE MON 1 IN

TAPE MON 2 IN

TAPE MON 1 OUT

TAPE MON 2 OUT

DUB OUT

RIGHT CHANNEL

PHONO

AUX

TAPE MON 1 IN

TAPE MON 2 IN

TAPE MON 1 OUT

TAPE MON 2 OUT

SELECTOR SW1(A)

SELECTOR SW1(B)

TAPE MONITOR 1 SW2

TAPE MONITOR 2 SW3

STEREO MONO SW4(a)

LOUDNESS SW5

LOW FILTER OFF SW6

HIGH FILER SW7

BALANCE

VOLUME

TREBLE

BASS

IC 202 AN217

IC 301 AN211

IC201 BA401

IC202 AN217

IC301 AN211

SPEAKERS (LEFT)

SPEAKERS (RIGHT)

HEADPHONES

M1 SIGNAL METER

M2 TUNING METER

SW1(C)

SW1(D)

SW1(E)

SW1(F)

SW1(G)

STEREO

MONO

FUNCTION IND LAMP

DIAL LAMP

POWER SW9

SWITCHED

UNSWITCHED

FUSE 2

THERMAL PROTECTOR

FUSE 1 3A SW10

CSA ONLY

AC120V 60Hz
(AC 220/240V 50Hz)

Note : 1. Resistance values are indicated in ohms unless otherwise specified K 1,000, M 1,000,000).
2. Capacitance values are shown in microfarads unless otherwise noted P micro-microfarads).
3. DC voltages are referenced to ground under the following conditions.
No signal.
( ) 1000μV FM stereo signal.

TRANSISTORS

Ref. No.	Type No.	R/S Part No.	Part No.	Manufacturer	Substitute	
					Type No.	Manufacturer
TR101	3SK45		30400071	Hitachi	3SK41	Hitachi
TR102	3SK45		30400071	Hitachi	3SK41	Hitachi
TR103	2SC839		30200832	NEC	2SC1675	NEC
TR201	2SC710C		30200381	Mitsubishi	2SC1908	Sony
TR202	2SC710D		30200382	Mitsubishi	2SC1908	Sony
TR203	2SC710C		30200381	Mitsubishi	2SC1908	Sony
TR204	2SC536		30200131	Sanyo	2SC945	NEC
TR205	2SC536		30200131	Sanyo	2SC945	NEC
TR206	2SA733P		30000424	NEC		
TR207	2SA733P		30000424	NEC		
TR208	2SA733P		30000424	NEC		
TR209	2SA733P		30000424	NEC		
TR210	2SC536		30200131	Sanyo	2SC945	NEC
TR301	2SA733Q		30000423	NEC		
TR302	2SA733Q		30000423	NEC		
TR303	Not Used					
TR304	2SA733Q		30000423	NEC		
TR305	2SA733Q		30000423	NEC		
TR306	2SA733Q		30000423	NEC		
TR351	2SA733Q		30000423	NEC		
TR501a,b	2SA841		30000442	Toshiba	2SA640	NEC
TR502a,b	2SC1681		30201132	Toshiba	2SC1222	NEC
TR601a,b	2SA841		30000441	Toshiba	2SA640	NEC
TR602a,b	2SA841		30000441	Toshiba	2SA640	NEC
TR603a,b	2SC1509		30200963	Matsushita	2SC1940	NEC
TR604a,b	2SC1539		30200921	Toyo Electronics		
TR605a,b	2SC1567		30201023	Matsushita	2SC1124	Sony
TR606a,b	2SA794		30000413	Matsushita	2SA706	Sony
TR607a,b	2SC1403		30200891	Sanken	2SC1402	Sanken
TR608a,b	2SC1403		30200891	Sanken	2SC1402	Sanken
TR609a,b	2SC536		30200522	Sanyo	2SC945	NEC
TR610a,b	2SA733		30000423	NEC		
TR751	2SA733Q		30000423	NEC		
TR801	2SB511		30100031	Sanyo		
TR802	2SC1567		30201023	Matsushita	2SC1124	Sony
TR901a,b	2SC1681		30201132	Toshiba	2SC1222	NEC
TR902a,b	2SA841		30000442	Toshiba	2SA640	NEC
TR903a,b	2SC1681		30201132	Toshiba	2SC1222	NEC

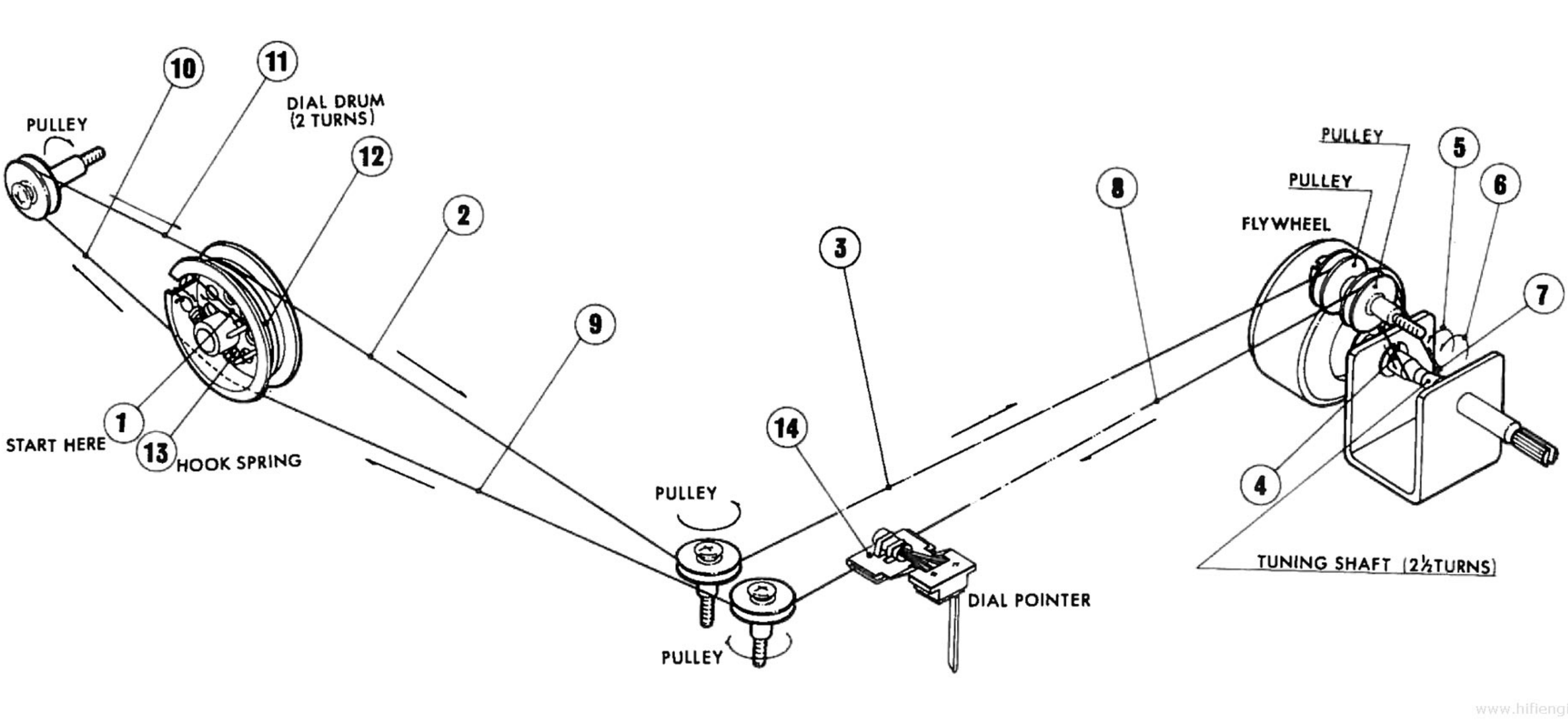
MISCELLANEOUS PARTS LIST

Ref. No.	Description	R/S Part No.	Mfr's Part No.
1	Wrapping Pin 13mm		19044001
2	Wrapping Pin 26mm	HB-4093	19042001
3	Wrapping Pin 19mm	HB-0945	19043001
4	Heat Sink for TR801	HB-1879	15028001
5	Heat Sink for Power Transistor	HH-0165	15066001
6	Holder for Thermal Protector	HB-4096	63255001
7	Fiber Sheet for Thermal Protector	HB-3206	84159001
8	12P Phono Jack	S-0721	33120240
9	Fuseholder FH002	F-1017	34032001
10	AC Outlet IR-02	J-0650	34048001
11	Fuse ST-2 3A, 125V	HF-1100	38334130
12	Tapping Screw 3x8S	HS-0996	40130081
13	Screw M3x6	HS-0458	40330061
14	4P Antenna Screw Terminal	J-4308	53041600
15	10P Speaker Terminal	J-4430	53100240
16	Cord Strain Relief SR-4P4	HB-0954	74089001
17	Cord Strain Relief SR-4K4	HB-3212	74035001
18	Bar Antenna Holder	A-4367	63030001
19	Metal Fitting for Bar Antenna	A-4366	63026002
20	Screw M4x45	HS-1869	40340451
21	Flat Washer	HW-0969	42120421
22	Screw M3x8		40330061
23	Spring Washer	HN-0344	42250341
24	FM Line Cord Antenna	H-3533	63101001
25	AC Cord with Plug	W-1460	62110004
26	Ground Terminal (PHONO)	HB-0953	53012300
27	Nut M3	HN-0081	41113070
28	Headphone Jack	J-0722	33031300
29	Dial Lamp Diffuser		84219001
30	Dial Scale Glass	G-0228	20086001
31	Metal Fitting for Dial Glass	HB-4098	63280001
32	Dial Shaft Assembly	D-3184	23043001
33	Pulley Shaft E	HS-0994	24003001
34	Pulley Shaft C	HS-1552	24001002
35	Plastic Pulley	D-0250	84085001
36	Dial Lamp House	HB-4097	08047001
37	Terminal Strip 2P1L2P		51024002
38	Tapping Screw M3x6		40130061
39	Metal Fitting for Wooden Cabinet	HB-3223	63287001
40	Dial Pointer with Lamps	D-1165	25040001
41	Metal Fitting for Heat Sink		63302001
42	Terminal Strip 1P1L1P	HB-3220	51025002
43	Metal Fitting for Thermal Protector	HB-4104	63255001
44	Dial Drum		21008003
45	Spring Coil for Dial Drum	D-0342	19045001
46	Nut M4	HN-0240	41114010
47	Flat Washer M4	HW-0969	42120421

Ref. No.	Description	R/S Part No.	Mfr's Part No.
48	Spring Washer M4	HW-0806	42250441
49	Front Panel Assembly	Z-2586	10178001
50	Tuning Knob	K-2038	29204001
51	Knob for SPEAKERS, SELECTOR, BASS, TREBLE, BALANCE and VOLUME	K-2039	29205001
52	Push Switch Button	K-2040	29206001
53	Power Switch Button	K-2041	29207001
54	Wooden Cabinet	Z-2587	85064001
55	Bottom Plate		05044001
56	Plastic Foot	F-0160	74074001
57	Screw M5x15	HS-2277	40350151
58	Plastic Washer	HW-0809	84092001
59	Tapping Screw M4x15 (Black)	HS-2278	40640155
60	Wire Bundler		84205001
61	Meter Spring		19041002
62	Ground Lug Terminal	H-3532	51030001
63	Lock Washer		42380331

DIAL STRINGING DIAGRAM

Note: Tuning capacitor should be in fully closed position.



BLOCK DIAGRAM

FM ANT. 300 ohm / 75 ohm
FM RF AMP. TR101
FM MIX TR102
FM IF AMP. TR201
CERAMIC FILTER CF201a,b
FM IF AMP. IC201 TR202
CERAMIC FILTER CF202
FM IF AMP. IC202
FM IF AMP. TR203
RATIO DETECTOR D207, 208
FM AGC D201 D202
FM OSC TR103
FM AFC D101
AM ANT
AM MIX IC202
AM IF AMP. IC202
AM DETEC-TOR D402
AM OSC IC202
AM AGC IC202
SIGNAL METER
SW1
FM MPX IC301
LOWPASS FILTER
FM MUTING TR302
FM/AM AUDIO AMP. TR305
LOWPASS FILTER
FM MUTING TR304
FM/AM AUDIO AMP. TR306
MUTING STEREO SWITCHING TR204-210
STEREO-MONO PL-SWITCHING TR301
SW4
SW1
DIAL POINTER

FUSE
SW10
SW9
AC INPUT
POWER TRANSFOR-MER
AC OUTLET
AC OUTLET
POWER SUPPLY TR801, 802 D801-806
-12V +40V -40V +43V
DIAL LAMPS
SW1
AUX
PHONO
AM
FM
FM MUTING

PHONO
AUX
TAPE1. IN
TAPE2. IN
TAPE1. OUT
TAPE2. OUT
DUB OUT
L:ch
R:ch
RIAA EQ AMP. TR501, 502
SW1
SW2
SW3
SW4
BAL.
VOL.
LOUD-NESS SW5
AUDIO AMP. TR901, 902
TONE CONTROL BASS, TREBLE TR903
LOW FIL. SW6
HIGH FIL. SW7
SUBSONIC FILTER •
PRE DRIVER TR603
DIFFERENTI-AL AMP. TR601, 602
DC BIAS CIRCUIT TR604
POWER AMP. TR605, 607
LIMITER TR609, 610
POWER AMP. TR606, 608
SW8
B SP.
A SP.
ATT
HEADPHONES

SW : 1 SELECTOR
SW : 2 TAPE MONITOR 1
SW : 3 TAPE MONITOR 2
SW : 4 MODE
SW : 5 LOUDNESS
SW : 6 LOW FILTER
SW : 7 HIGH FILTER
SW : 8 SPEAKER SELECTOR
SW : 9 POWER SWITCH
SW : 10 THERMAL SWITCH

• This R/C Filter circuit is added to deliberately roll off the extreme low end frequencies (−0.5 dB at 20 Hz, −6 dB at 8 Hz)