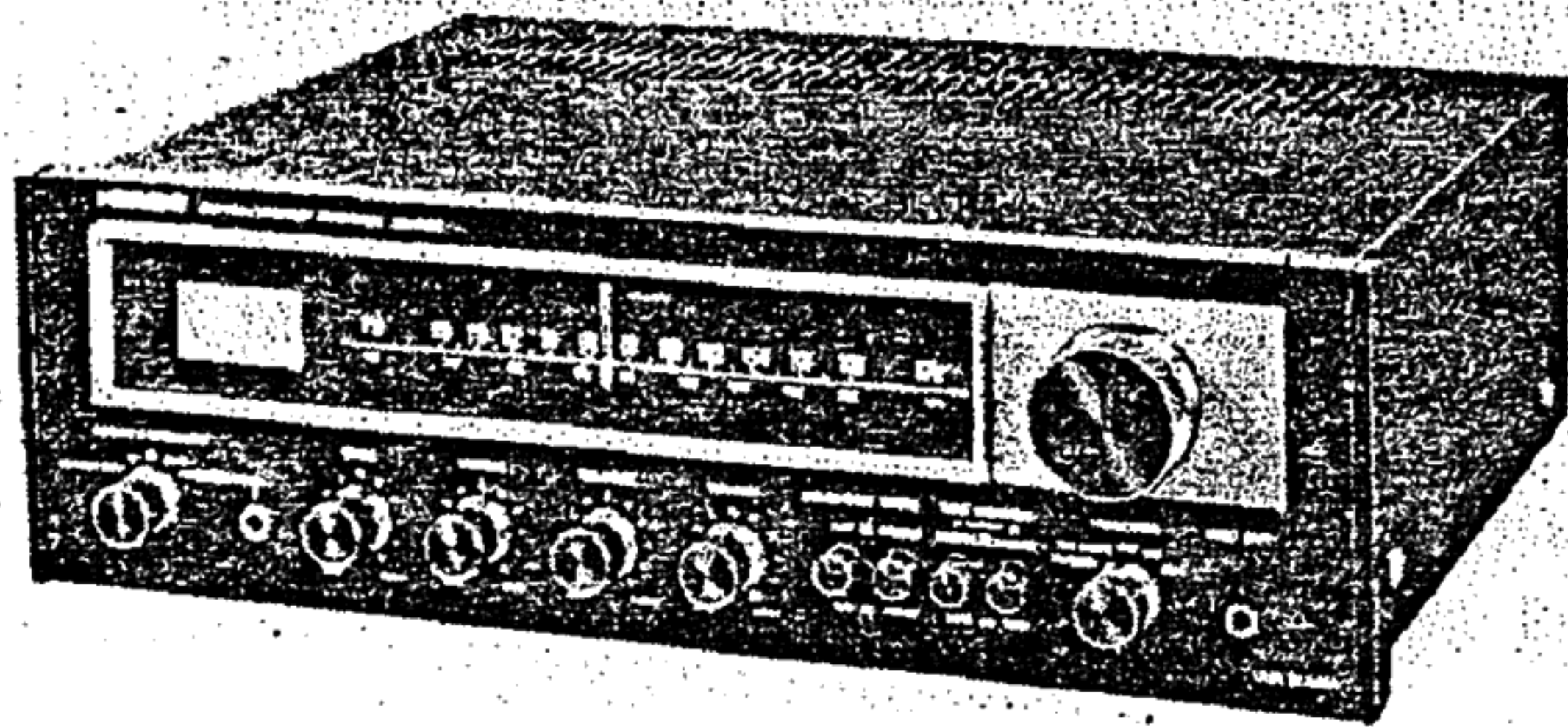


SR-502 (silver)



HITACHI HI-FI COMPONENT

STEREO RECEIVER

MODEL **SR-302**

MODEL **SR-502**

SERVICE MANUAL

NO. 78

1975

1. SPECIFICATIONS

FM SECTION

Frequency range	88-108MHz
Sensitivity (IHF)	1.9 μ V
Harmonic distortion	
Mono	0.2% (400Hz)
Stereo	0.6% (400Hz)
Capture ratio (IHF)	1.2dB
Signal-to-noise ratio	65dB
Stereo separation	40dB (1kHz)
Selectivity (IHF)	46dB
Image rejection	52dB
IF rejection	90dB
Spurious rejection	80dB
AM suppression	56dB
Antenna impedance	300 ohms

AM SECTION

Frequency range	530-1,605kHz
Sensitivity (IHF)	300 μ V/m (S/N 20dB), 20 μ V
Signal-to-noise ratio	50dB
Image rejection	55dB
IF rejection	37dB

AUDIO SECTION

Music power (IHF)	
SR-302	25W/ch+25W/ch (8 ohms, 1kHz, 1%)
SR-502	37W/ch+37W/ch (8 ohms, 1kHz, 1%)
RMS power	
SR-302	15W/ch+15W/ch (40Hz-20kHz, 8 ohms)
SR-502	20W/ch+20W/ch (40Hz-20kHz, 8 ohms)
SR-502	25W/ch+25W/ch (8 ohms, 1kHz, 1%)
Harmonic distortion	
at 1/2 rated output	0.1% (1kHz)
Intermodulation distortion	
at 1/2 rated output	0.1% (60Hz:7kHz = 4:1)
Frequency response (IHF)	20Hz-30kHz (\pm 1dB)

Power bandwidth (IHF)	20Hz-40kHz
Damping factor	30 (8ohms, 1kHz)
Hum and noise (IHF)	
Phono	66dB
Aux	70dB
Input sensitivity	
Phono	2.5mV (50 kohms)
Aux	200mV (100 kohms)
Tape	200mV (35 kohms)
Phono overload	100mV (1kHz, 1%)
Tape out level	
Tape out	200mV
DIN (Tape out)	40mV
Tone control	
Bass	\pm 10dB (100Hz)
Treble	\pm 10dB (10kHz)
Dimensions ...	444(W) x 137(H) x 347(D)mm (120V set)
	424(W) x 136(H) x 347(D)mm (220-240V set)
Weight	
SR-302 (120V set)	7.8kg
SR-302 (220-240V set)	7.6kg
SR-502 (120V set)	8.6kg
SR-502 (220-240V set)	8.4kg
Power supply	AC 120, 220-240V, 50/60Hz
Power consumption	
SR-302	75W (120V set)
SR-302	115W (220-240V set)
SR-502	110W (120V set)
SR-502	170W (220-240V set)
Auxiliary circuits	
FM stereo indicator, Signal meter, Illuminated dial pointer, 2 tape monitor switches (SR-502 only), FM muting switch, Loudness switch, DIN tape IN-OUT, Speaker selector switch, Headphone jack.	

* The above specifications are subject to change for improvement without notice.

2. FEATURES

1. Since a high performance FET is used in the input stage of the FM tuner, noise and interference are decreased.
2. The employment of a sharp characteristic ceramic filter and a high quality IC in the IF amplifier section of the FM tuner has further improved the selectivity, capture ratio and distortion characteristics.
3. The signal strength meter indicates the correct tuning point during the reception of broadcasts.
4. Equalizer circuit and the drive-stage of the main amplifier are high S/N ratio circuits using

the low noise and high dynamic range dual power (positive negative) IC.

5. All-stage direct-connection inverted Darlington OCL circuit, which uses NPN, PNP silicone transistor with good linearity, is employed to improve frequency characteristic, power bandwidth and distortion ratio.
6. Since REC OUT jack is installed in the front panel, connection for recording can be done without going round of to the rear panel.
7. Two sets of speakers can be connected and selected by switching.

3. FRONT AND REAR PANEL

FRONT PANEL

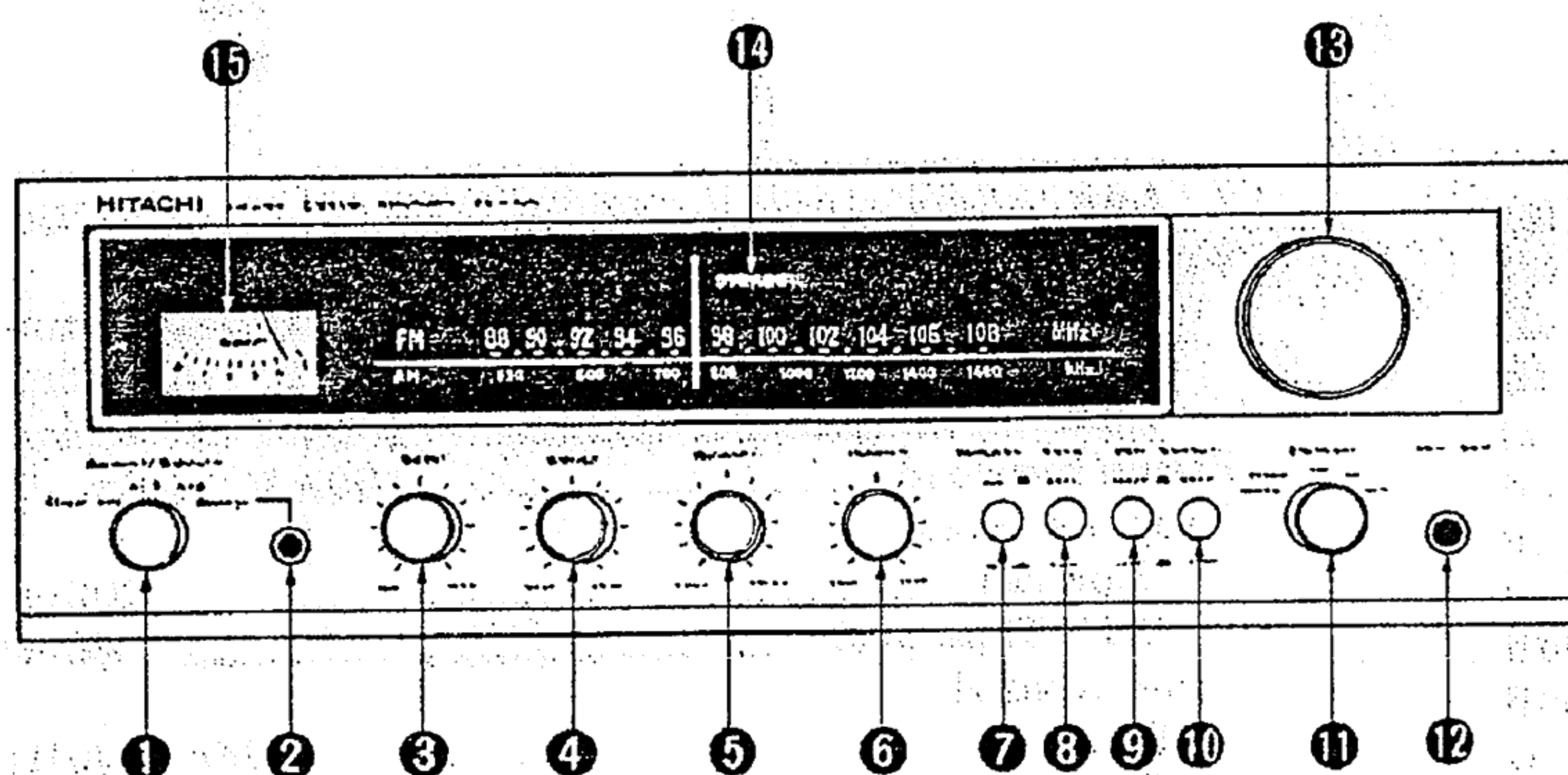


Fig. 1

- ① POWER/SPEAKER SWITCH
- ② HEADPHONE JACK
- ③ BASS CONTROL
- ④ TREBLE CONTROL
- ⑤ BALANCE CONTROL
- ⑥ VOLUME CONTROL
- ⑦ LOUDNESS SWITCH
- ⑧ MODE SWITCH
- ⑨ FM MUTE SWITCH (SR-302)
- ⑩ TAPE MONITOR SWITCH - 1 (SR-502)
- ⑪ TAPE MONITOR SWITCH (SR-302)
- ⑫ TAPE MONITOR SWITCH-2 (SR-502)
- ⑬ FUNCTION SWITCH
- ⑭ REC OUT JACK
- ⑮ TUNING
- ⑯ FM STEREO INDICATOR
- ⑰ SIGNAL METER

REAR PANEL

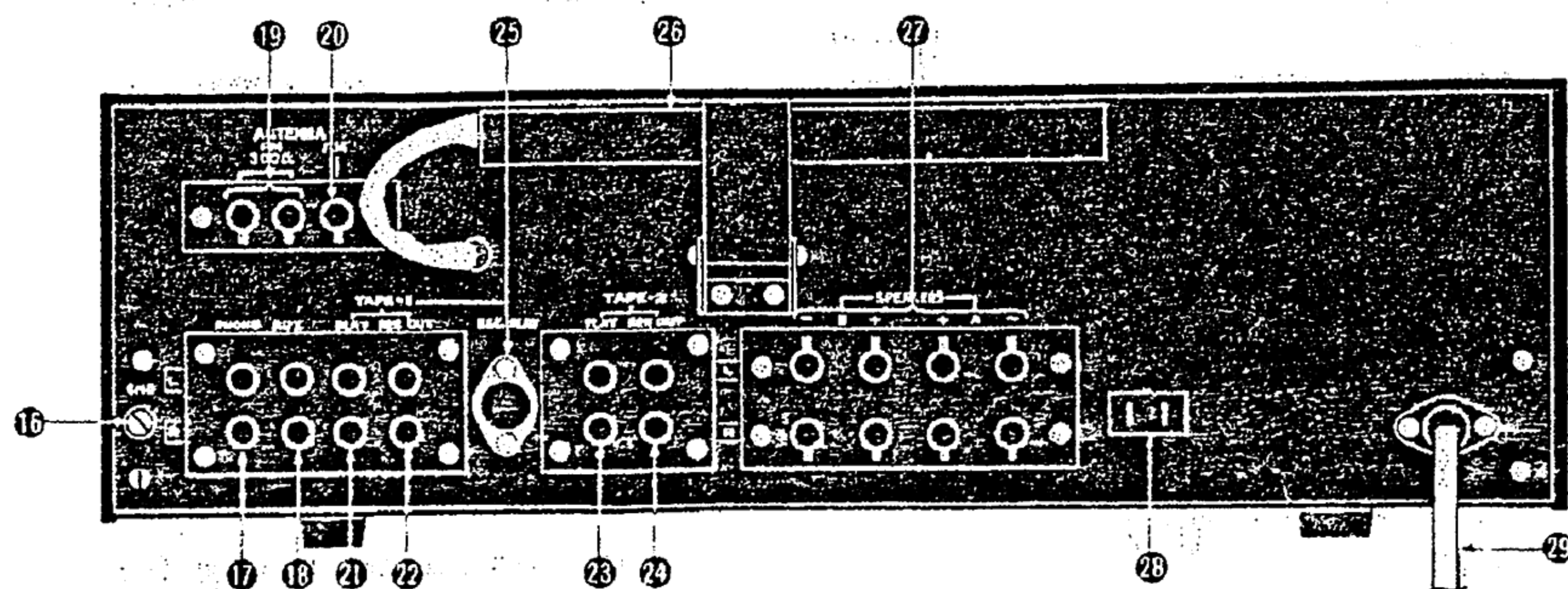


Fig. 2

- ⑰ GROUND TERMINAL
- ⑱ PHONO INPUT TERMINALS
- ⑲ AUXILIARY INPUT TERMINALS
- ⑳ FM ANTENNA TERMINALS
- ㉑ AM ANTENNA TERMINAL
- ㉒ TAPE-1 PLAYBACK TERMINALS
- ㉓ TAPE-1 REC OUT TERMINALS
- ㉔ TAPE-2 PLAYBACK TERMINALS (SR-502 only)
- ㉕ TAPE-2 REC OUT TERMINALS (SR-502 only)
- ㉖ DIN REC/PLAY SOCKET
- ㉗ AM BAR ANTENNA
- ㉘ SPEAKER TERMINALS
- ㉙ AC OUTLET (for 120V set only)
- ㉚ AC POWER CORD

4. DIFFERENCE OF SR-302 AND SR-502

4.1 SPECIFICATIONS

	SR-302	SR-502
Music power (IHF)	25W/ch+25W/ch (8 ohms, 1kHz, 1%)	37W/ch+37W/ch (8 ohms, 1kHz, 1%)
RMS power	15W/ch+15W/ch (40Hz-20kHz, 8 ohms) 16W/ch+16W/ch (8 ohms, 1kHz, 1%)	20W/ch+20W/ch (40Hz-20kHz, 8 ohms) 25W/ch+25W/ch (8 ohms, 1kHz, 1%)
Power consumption	75W (for U.S.A. & Canada) 115W (for U.K., Sweden & Europe)	110W (for U.S.A. & Canada) 170W (for U.K., Sweden & Europe)
Input sensitivity		
PHONO	210mV (100 kohms)	200mV (100 kohms)
TAPE	210mV (35 kohms)	200mV (35 kohms)
Signal to noise ratio		
Phono	50dB	55dB
AUX	62dB	65dB

4.2 CIRCUIT AND REPLACEMENT PARTS

SYMBOL NO.	SR-302			SR-502		
	STOCK NO.	DESCRIPTION		STOCK NO.	DESCRIPTION	
C713(L,R)	—	—	—	0248647	Ceramic, discal	7pF±0.5pF 50V
C715(L,R)	0275011	Mylar, film	0.01μF±10% 50V	0274011	Mylar, film	1000pF±10% 50V
C716(L,R)	0274014	Mylar, film	0.0033μF±10% 50V	—	—	—
C817	0245018	Ceramic, discal	0.022μF ±80% -20% 25V	—	—	—
R701(L,R)	0114181	Carbon film	6.8kΩ±5% SRD¼P	0114177	Carbon film	4.7kΩ±5% SRD¼P
R706(L,R)	0114171	Carbon film	2.7kΩ±5% SRD¼P	0114169	Carbon film	2.2kΩ±5% SRD¼P
R725(L,R)	—	—	—	0119127	Metal	0.47Ω±10% RN2B
R726(L,R)	—	—	—	0119127	Metal	0.47Ω±10% RN2B
R727(L,R)	0119021	Metal	1Ω±10% RN1B	0119025	Metal	2.2Ω±10% RN1B
R809	—	—	—	0119047	Metal	33Ω±10% RN1B
R810	—	—	—	0119047	Metal	33Ω±10% RN1B
Q701(L,R)	2327713	2SC1162WT (C)		2327603	2SC1212WT (C)	
Q702(L,R)	2327703	2SA715WT (C)		2327393	2SA743A (C)	
Q703(L,R)	2327359	2SA670TDS (C)		2327763	2SA756 (C)	
Q704(L,R)	2327203	2SC1060 (C)		2327053	2SC1030 (C)	
	2505154	Audio printed wiring board assembly (for U.K. & Europe)		2505163	Audio printed wiring board assembly (for U.K. & Europe)	
	2505153	Audio printed wiring board assembly (for U.S.A. & Canada)		2505162	Audio printed wiring board assembly (for U.S.A. & Canada)	
	—	—		2505164	Audio printed wiring board assembly (for Sweden)	
S1	2617363	Rotary switch (for function sw.)		2617362	Rotary switch (for function sw.)	
F001	2727082	Wired in fuse (1.5A, SLOW) (for U.S.A. & Canada)		2727081	Wired in fuse (2A, SLOW) (for U.S.A. & Canada)	
F001	2720052	Wired in fuse (0.75A, SLOW) (for U.K. & Europe)		2727083	Wired in fuse (1A, SLOW) (for U.K. & Europe)	
F001	—	—		2727191	Fuse (1A, Time lag) (for Sweden)	
F701(L,R)	2727222	Fuse (2.5A, FAST)		2727223	Fuse (3A, FAST) (for U.S.A., Canada, U.K. & Europe)	
	—	—		2727335	Fuse (2.5A, Quick) (for Sweden)	
	2217872	Power transformer (for U.S.A. & Canada)		2217922	Power transformer (for U.S.A. & Canada)	
	2217873	Power transformer (for U.K. & Europe)		2217971	Power transformer (for U.K., Sweden & Europe)	
	3243611	Escutcheon assembly (for U.S.A. & Canada)		3243613	Escutcheon assembly (for U.S.A. & Canada)	
	3243612	Escutcheon assembly (for U.K. & Europe)		3243614	Escutcheon assembly (for U.K., Sweden & Europe)	

5. SERVICE POINT

1. Removing the audio printed wiring board

Detach screws shown in Fig. 3 and Fig. 4 after removing the escutcheon. Then, detach screws on the rear of the board, pull the audio printed wiring board forward, and it can be removed together with the control plate and the radiator as shown in Fig. 5.

2. Removing the variable resistors

After removing the escutcheon, take off then screws, nuts and washers shown in Fig. 6 to remove the control plate, then detach the variable resistors by melting the solder.

3. Replacing the dial scale lamp

Remove the lamp printed wiring board on which the dial scale lamp is glued as shown in Fig. 7. To remove the lamp, unsolder the lead connections and melt the adhesive with heat of soldering iron. Do not use your fingers to remove the lamp. They may be hurt.) The replacement lamp shown in Fig. 8 is available among our service parts. There is no need to fix it with adhesive.

4. Caution-when exchanging the power transistor

When exchanging one of the power transistors (Q701-704) due to its being deteriorated, be sure to check the other transistors.

Be careful, as they may deteriorate by reaction.

5. Caution-when exchanging the FM ceramic filter

FM-IF transformer (T101) and FM ceramic filter (MF201) are identified by color, red, blue and orange, depending on the range of accuracy of their characteristics. Replace T101 and MF201 in the same color when exchanging the parts. As service parts, T101 and MF201 are replaced as a pair.

6. DIAL CORD SETTING

Note: The dial pulley shows the position that the variable condenser is turned to the counterclockwise direction.

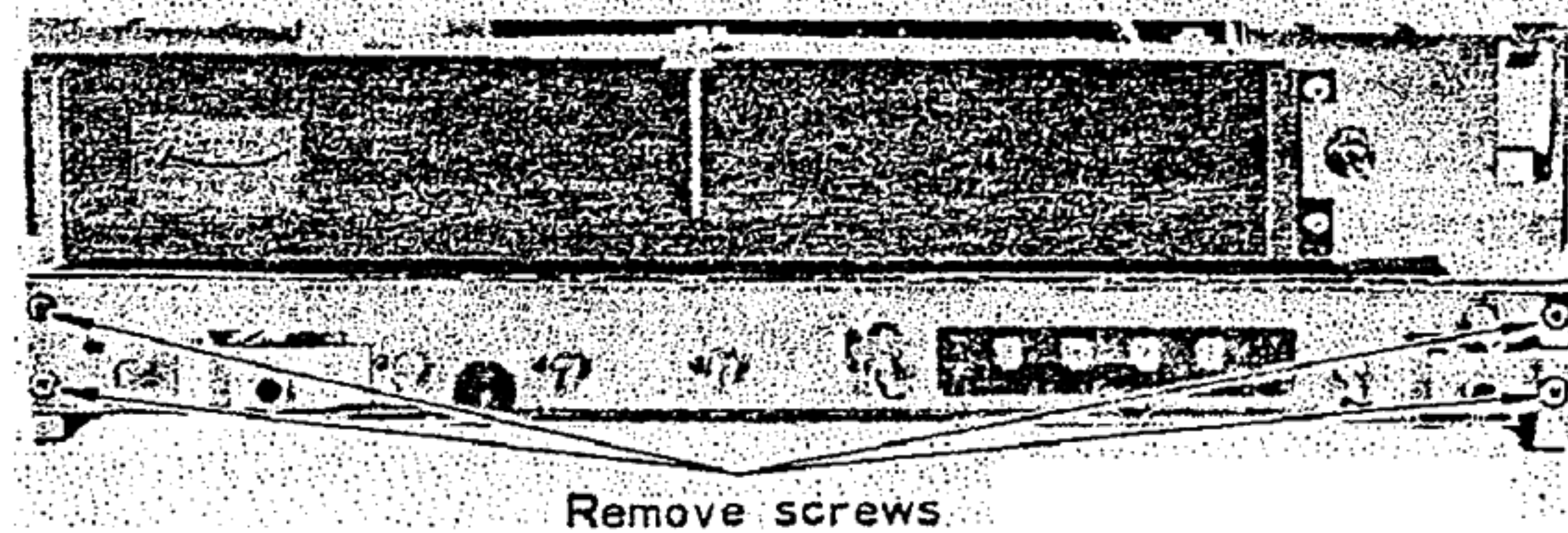


Fig. 3

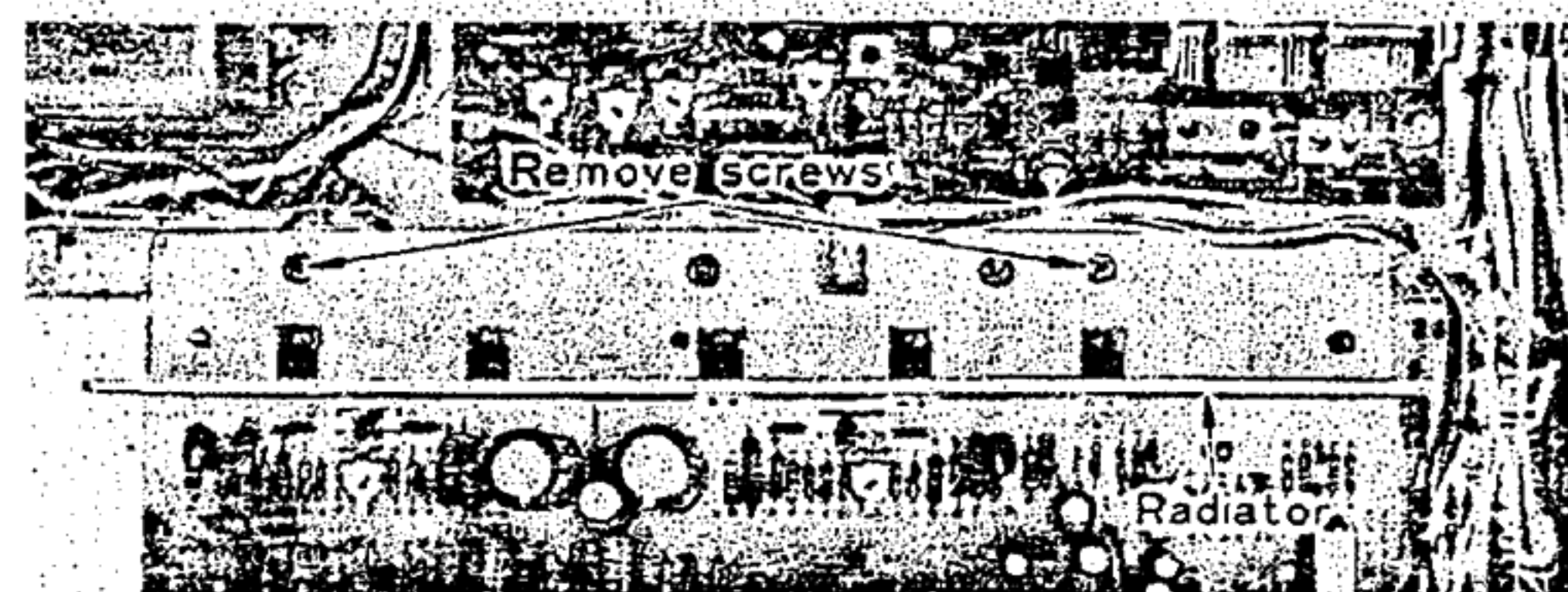


Fig. 4

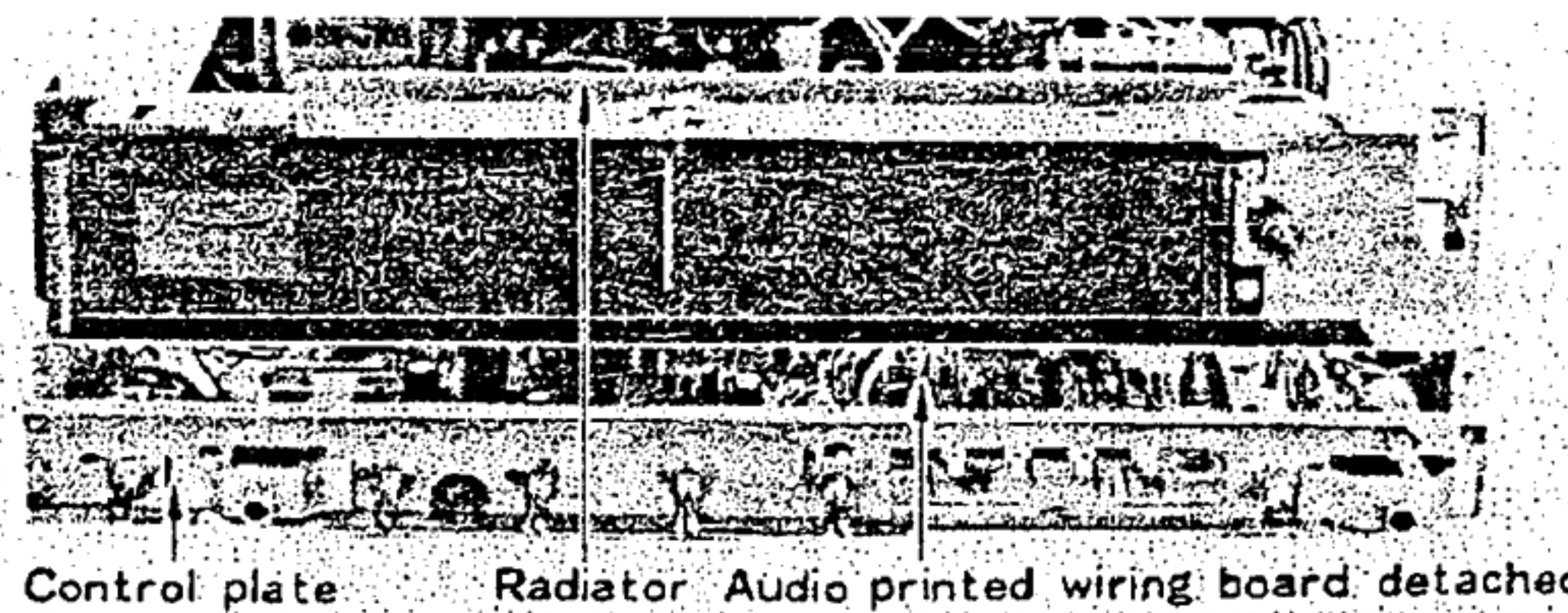


Fig. 5

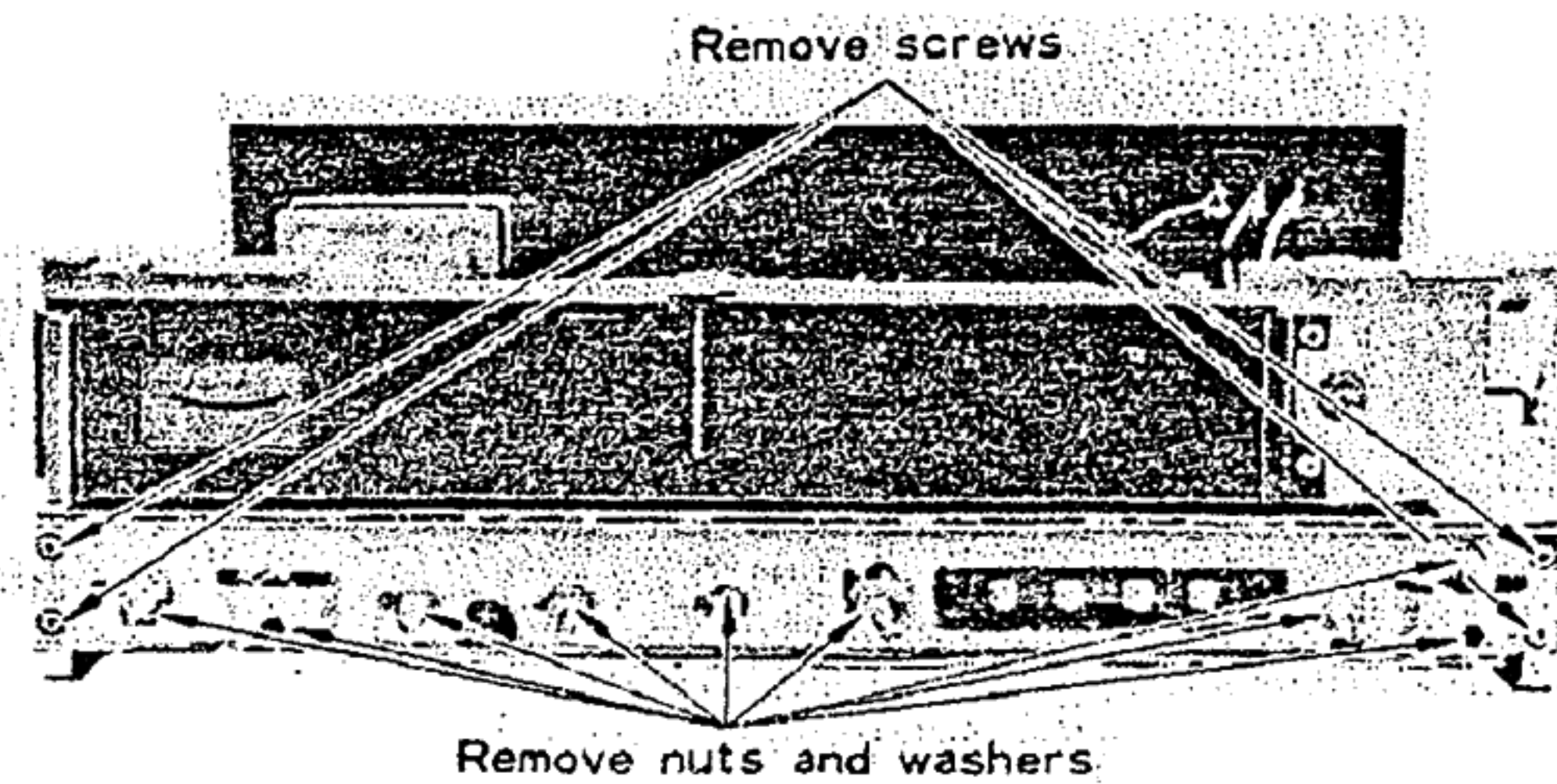


Fig. 6

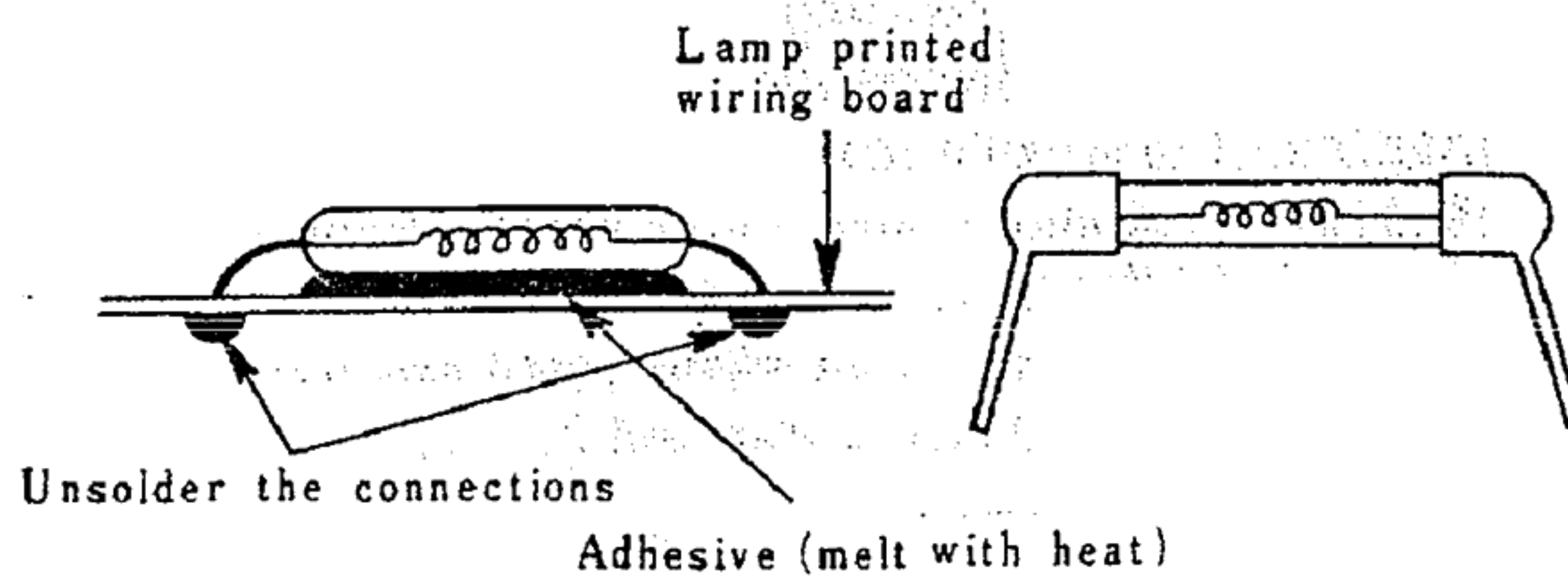


Fig. 7

Fig. 8

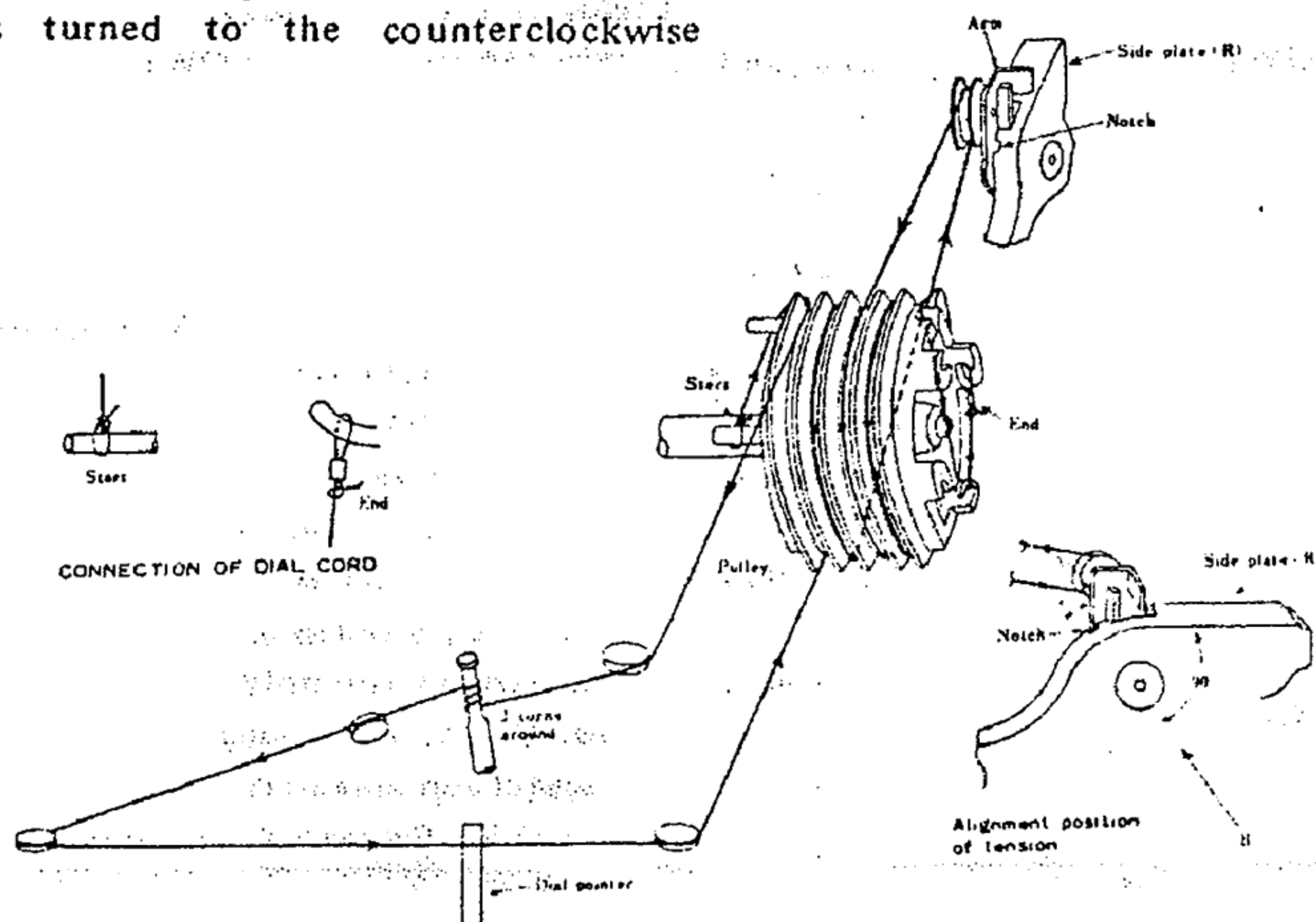


Fig. 9

7. GENERAL ALIGNMENT INSTRUCTION

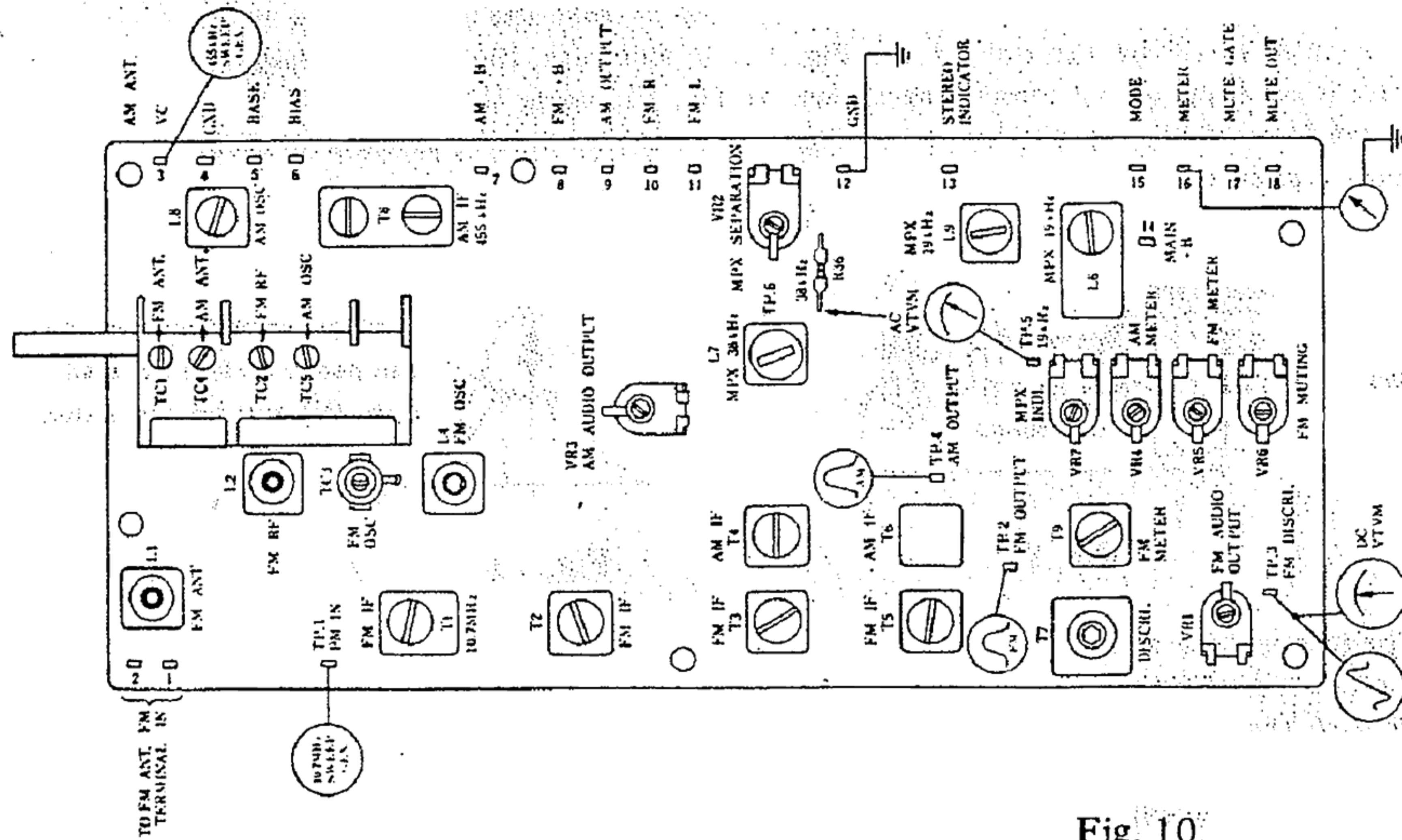


Fig. 10

7.1 FM TUNER ALIGNMENT

Steps	Item	Measuring Instrument	Input Terminal	Output Terminal	Frequency	Adjust	Wave Form		
1	(1) IF Amplifier	10.7MHz±150kHz Sweep Generator	TP 1	TP 2		T107 (upper) T109	Core Max.		
	(2)					T101, T102 T103, T105	CAUTION (1)		
	(3) "S" curve					T107 (lower) T107 (upper)	CAUTION (2)		
2	Discriminate	FM signal generator 100MHz 400Hz 100% modulated 60dB at input V.T.V.M.	Antenna terminal	TP 3 (DC balance meter)	100MHz	T107 (upper)	Adjust T107 so that pointer of Balance Meter will become 0V.		
3	Distortion	FM signal generator 100MHz 400Hz 100% modulated 60dB at input Distortion meter	Antenna terminal	TAPE OUT (L) or SP OUT (L)	100MHz	T107 (lower)	Adjust T107 so that distortion will become min.		
4	Covering	4.1 FM signal generator 90MHz 400Hz 100% modulated	Antenna terminal	TAPE OUT (L) or SP OUT (L)	90MHz (Turn the Dial pointer at 90MHz)	L104	Output Max.		
						4.2 FM signal generator 106MHz 400Hz 100% modulated		106MHz (Turn the Dial pointer at 106MHz)	TC103
5	Tracking	5.1 FM signal generator 90MHz 400Hz 100% modulated, 10dB at input V.T.V.M.	Antenna terminal	TAPE OUT (L) or SP OUT (L)	90MHz	L101, L102	Output Max.		
		5.2 FM signal generator 106MHz 400Hz 100% modulated, 10dB at input V.T.V.M.			106MHz	TC101 TC102			
6	Tuning Meter	FM signal generator 98MHz 400Hz 100% modulated, 60dB at input	Antenna terminal	Tuning Meter	98MHz (Set the Tuning meter so that pointer will be max.)	VR105	Adjust VR105 so that pointer of Tuning meter will be 4.		
7	Output	FM signal generator 98MHz 400Hz 30% modulated, 60dB at input	Antenna terminal	TAPE OUT	98MHz	VR101	Adjust the output to gain 200mV±2dB.		
8	FM Muting	FM signal generator 98MHz 400Hz 100% modulated, 24dB at input	Antenna terminal	TAPE OUT (L) or SP OUT (L)	98MHz	VR106	Adjust VR106 so that a signal can occur then the input signal is 24±6dB.		

CAUTION

- (1) At the article 1-(2). By the core of T101, T102, T103 and T105 let it be adjusted so that the gain will be max. And the wave form should be adjusted so that it will be the one of the Fig. 11. In this case, the output voltage at the surveying point of TP. 2 is weak, so let it be adjusted by connecting shown at Fig. 12, using V.T.V.M. Next, adjust it by T109 core, so that the wave form of Fig. 11 will dip just as Fig. 13 and at this time of adjustment stop the oscillation. (Oscillation variable capacitor is shorted.)

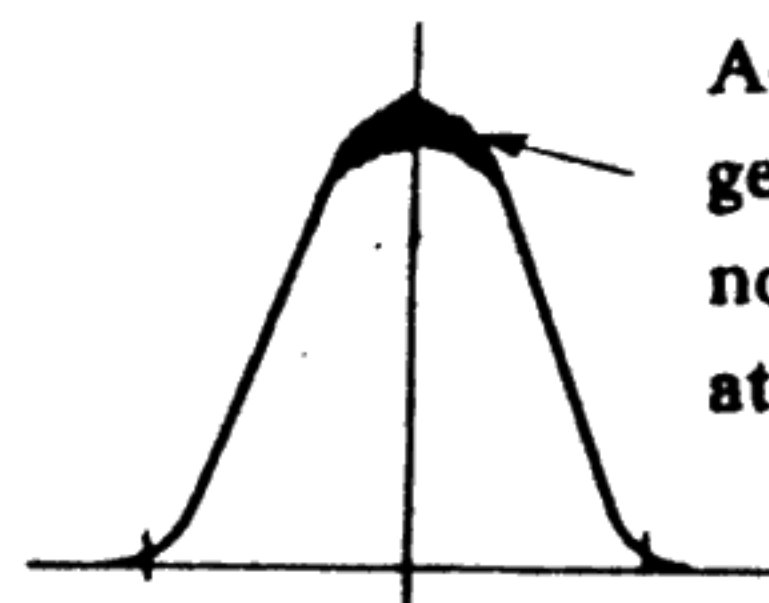


Fig. 11

Adjust the output of genescope so that the noise will be out a little at the tip.

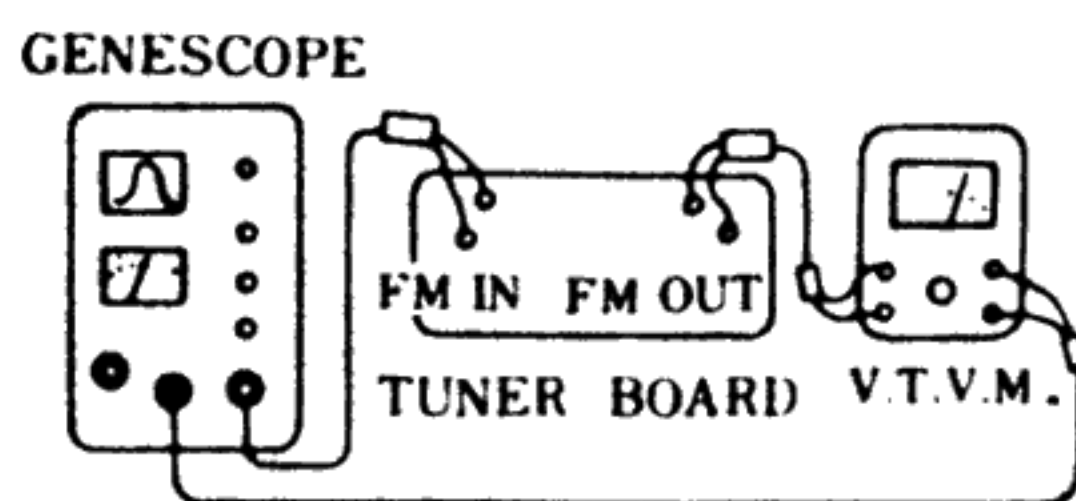


Fig. 12

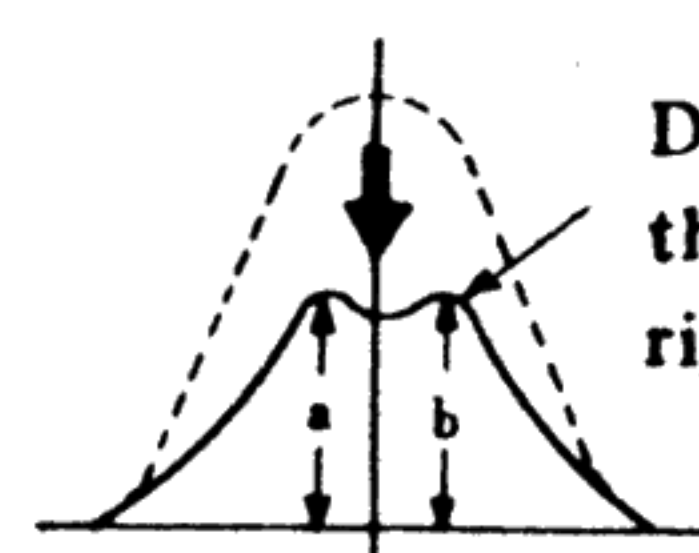


Fig. 13

Dip the wave form so that the peaks of left (a) and right (b) will be the same.

- (2) At the article 1-(3). Adjust so that it will be just as S curve of Fig. 14 with the secondary core (upper) of T107. And by the primary core (lower) of the T107, adjust it so that the gain will be max. In this case, A and B will be at the symmetry position of C, and adjust it as the straight line can be gained. At the time of adjustment of Caution (1) and (2), we use ceramic filter, so the center of the marker will not sometimes come on that of wave form. In this case, neglect the marker.

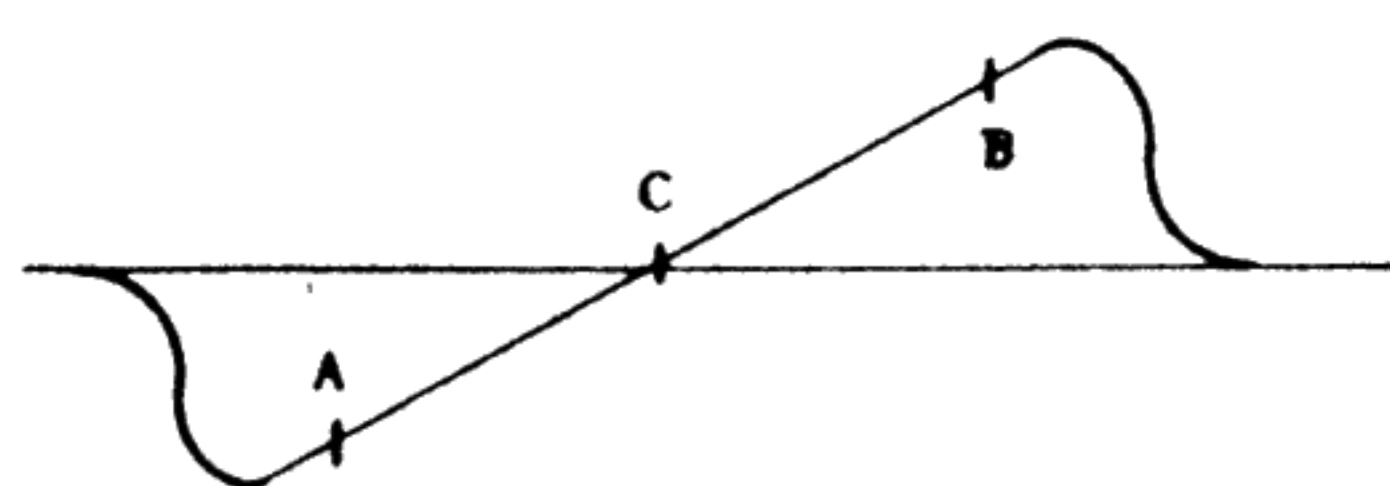


Fig. 14

7.2 FM MPX ALIGNMENT

Steps	Item	Measuring Instrument	Input Terminal	Output Terminal	Frequency	Adjust	Wave Form	
1						VR107	Set the VR107 in the center.	
2	(1)	19kHz 38kHz Tuning coil	FM signal generator 60dB at input Stereo signal generator pilot signal (19kHz) 8% modulated V.T.V.M.	Antenna terminal	TP 5	100MHz	L106, L109	Adjust L106 and L109 so that 19kHz. output wave form becomes max.
	(2)				TP 6		L107	Adjust L107 so that the (38kHz) output wave form becomes max.
3	(1)	Separation	1. FM signal generator 100MHz, 60dB at input 2. Stereo signal generator Main signal 92% modulated Pilot signal 8% modulated V.T.V.M.	Antenna terminal	FM OUT (L) or SP OUT (L)	100MHz		Set the tuning knob so that pointer of meter will become max.
	(2)						L109	After making the signal of L ch and Pilot, adjust L109 so that the output wave form of L ch become max.
	(3)						VR102	After making the signal of R ch and Pilot, adjust VR 102 so that the output wave form of L ch becomes min.
	(4)							Optimize VR102 so that the leak level of the L ch signal is equal to that of the R ch signal.
4	Lighting Level of STEREO Indicator Lamp	FM signal generator 100MHz 60dB at input Stereo signal generator pilot signal (19kHz) 5% modulated.	Antenna terminal	STEREO Indicator Lamp	100MHz	VR107	Adjust VR107 so that stereo indicator lamp will be lighted when the modulation degree of pilot signal is 5%.	

7. GENERAL ALIGNMENT INSTRUCTION

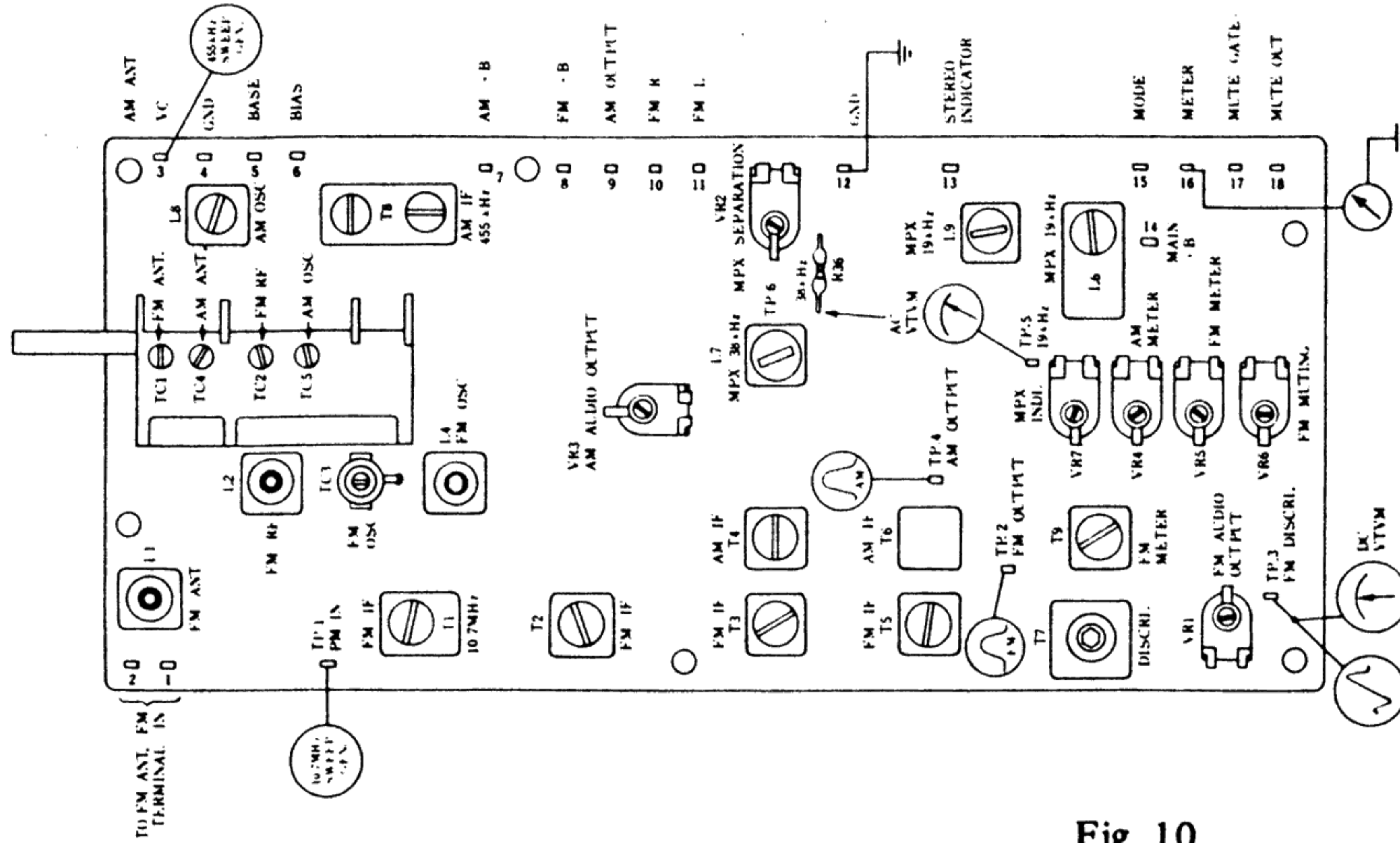
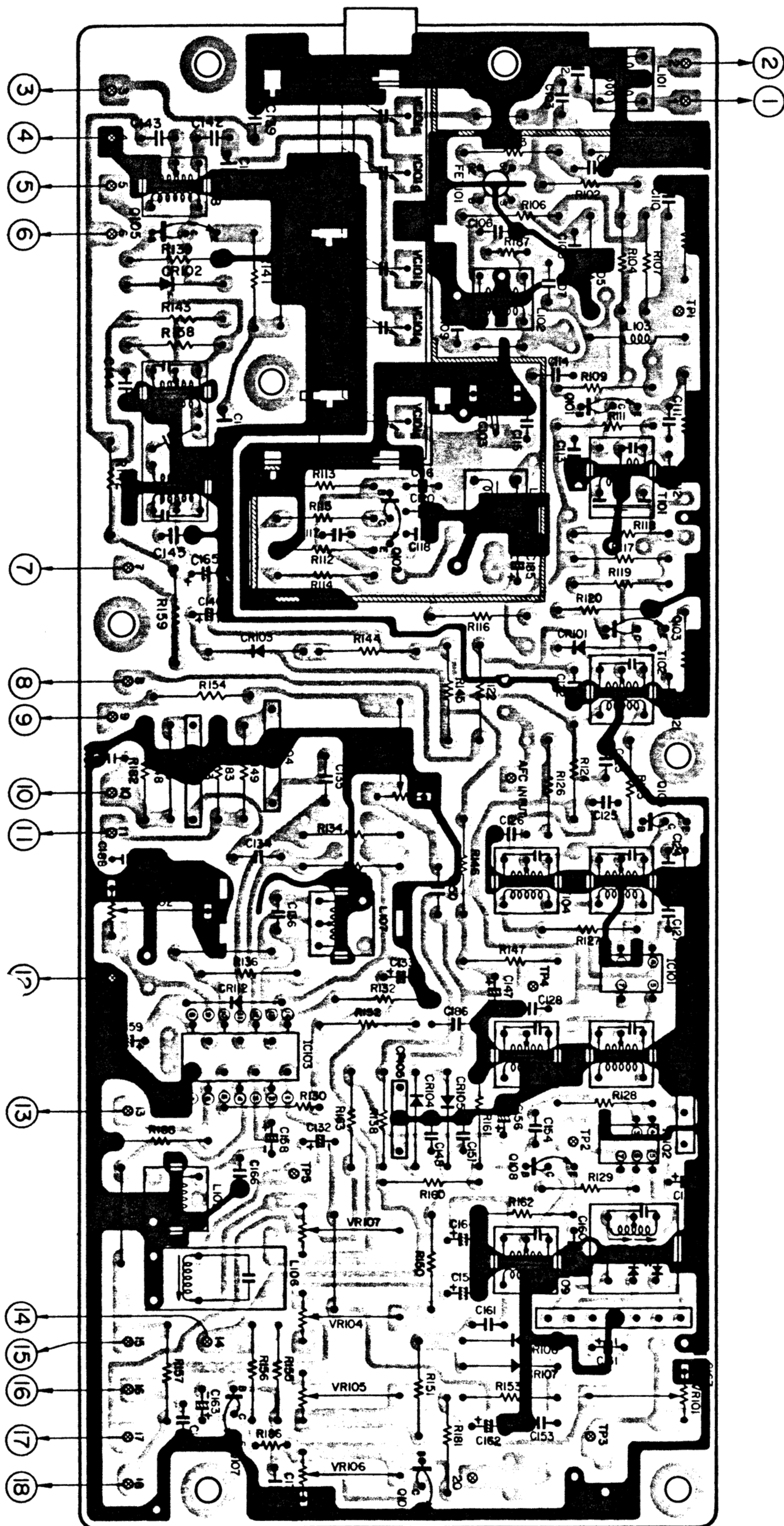


Fig. 10

7.1 FM TUNER ALIGNMENT

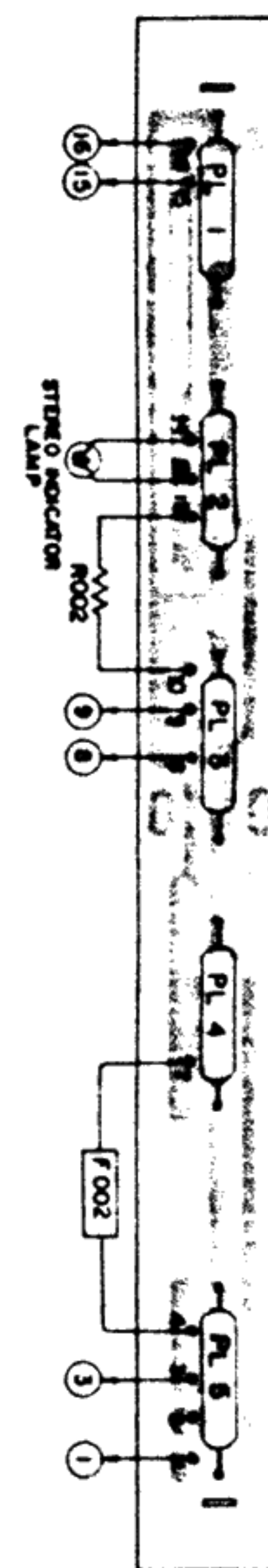
Steps	Item	Measuring Instrument	Input Terminal	Output Terminal	Frequency	Adjust	Wave Form		
1	(1) IF Amplifier	10.7MHz±150kHz Sweep Generator	TP 1	TP 2		T107 (upper) T109	Core Max.		
	(2)					T101, T102 T103, T105	CAUTION (1)		
	(3) "S" curve					TP 1	TP 3	T107 (lower) T107 (upper)	CAUTION (2)
2	Discriminate	FM signal generator 100MHz 400Hz 100% modulated 60dB at input V.T.V.M.	Antenna terminal	TP 3 (DC balance meter)	100MHz	T107 (upper)	Adjust T107 so that pointer of Balance Meter will become 0V.		
3	Distortion	FM signal generator 100MHz 400Hz 100% modulated 60dB at input Distortion meter	Antenna terminal	TAPE OUT (L) or SP OUT (L)	100MHz	T107 (lower)	Adjust T107 so that distortion will become min.		
4	Covering	4.1 FM signal generator 90MHz 400Hz 100% modulated	Antenna terminal	TAPE OUT (L) or SP OUT (L)	90MHz (Turn the Dial pointer at 90MHz)	L104	Output Max.		
						4.2 FM signal generator 106MHz 400Hz 100% modulated		106MHz (Turn the Dial pointer at 106MHz)	TC103
5	Tracking	5.1 FM signal generator 90MHz 400Hz 100% modulated, 10dB at input V.T.V.M.	Antenna terminal	TAPE OUT (L) or SP OUT (L)	90MHz	L101, L102	Output Max.		
		5.2 FM signal generator 106MHz 400Hz 100% modulated, 10dB at input V.T.V.M.			106MHz	TC101 TC102			
6	Tuning Meter	FM signal generator 98MHz 400Hz 100% modulated, 60dB at input	Antenna terminal	Tuning Meter	98MHz (Set the Tuning meter so that pointer will be max.)	VR105	Adjust VR105 so that pointer of Tuning meter will be 4.		
7	Output	FM signal generator 98MHz 400Hz 30% modulated, 60dB at input	Antenna terminal	TAPE OUT	98MHz	VR101	Adjust the output to gain 200mV±2dB.		
8	FM Muting	FM signal generator 98MHz 400Hz 100% modulated, 24dB at input	Antenna terminal	TAPE OUT (L) or SP OUT (L)	98MHz	VR106	Adjust VR106 so that a signal can occur then the input signal is 24±6dB.		

8. TUNER PRINTED WIRING BOARD



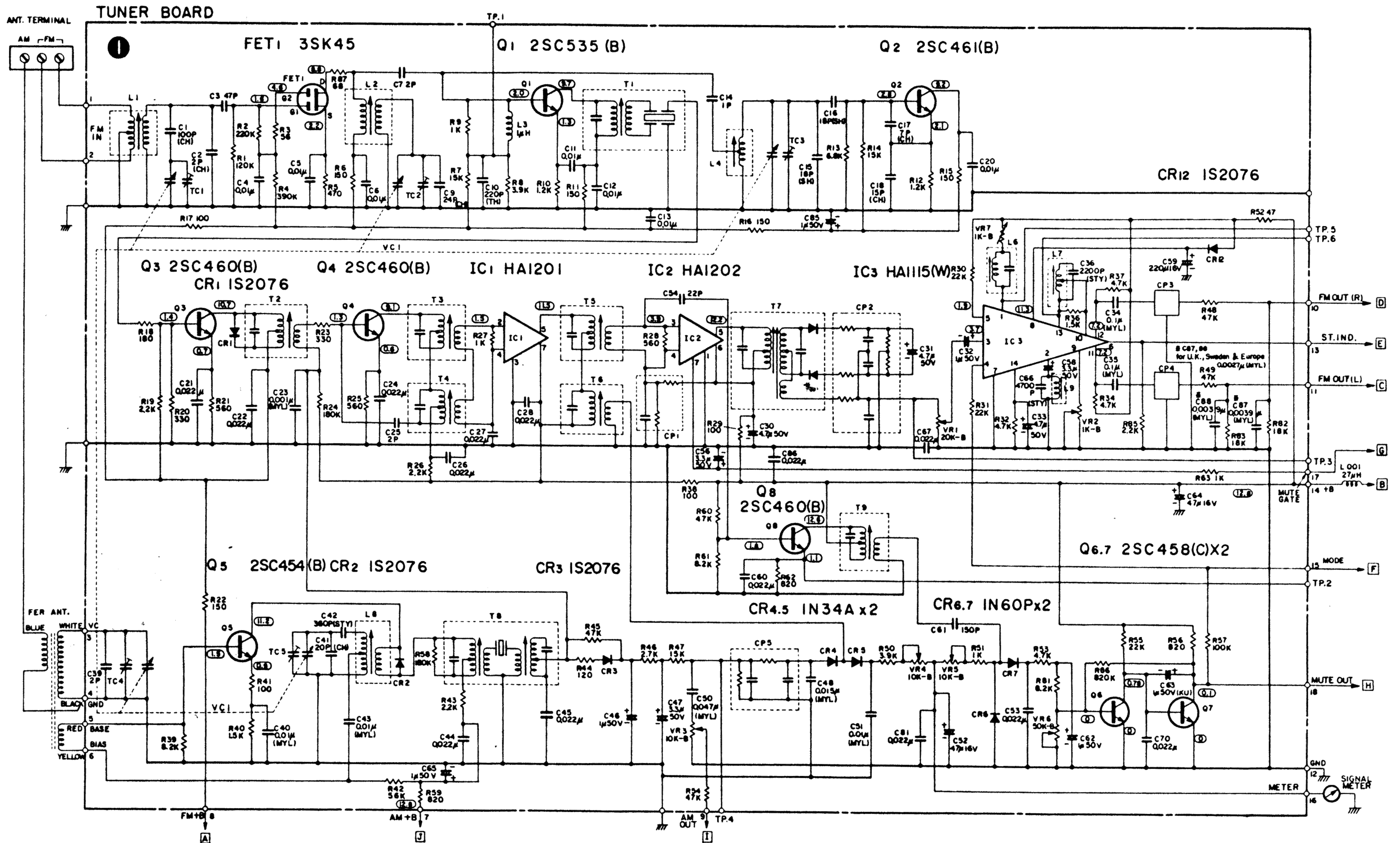
- ① FM INPUT
- ② FM INPUT
- ③ FERRITE ANTENNA
- ④ EARTH
- ⑤ FERRITE ANTENNA
- ⑥ FERRITE ANTENNA
- ⑦ AM+B (12.8V)
- ⑧ FM+B (12.8V)
- ⑨ AM OUTPUT
- ⑩ FM OUTPUT (R)
- ⑪ FM OUTPUT (L)
- ⑫ EARTH
- ⑬ STEREO INDICATOR LAMP
- ⑭ +B (12.8V)
- ⑮ MODE SWITCH
- ⑯ SIGNAL METER
- ⑰ MUTE GATE
- ⑱ MUTE OUTPUT

9. LAMP PRINTED WIRING BOARD

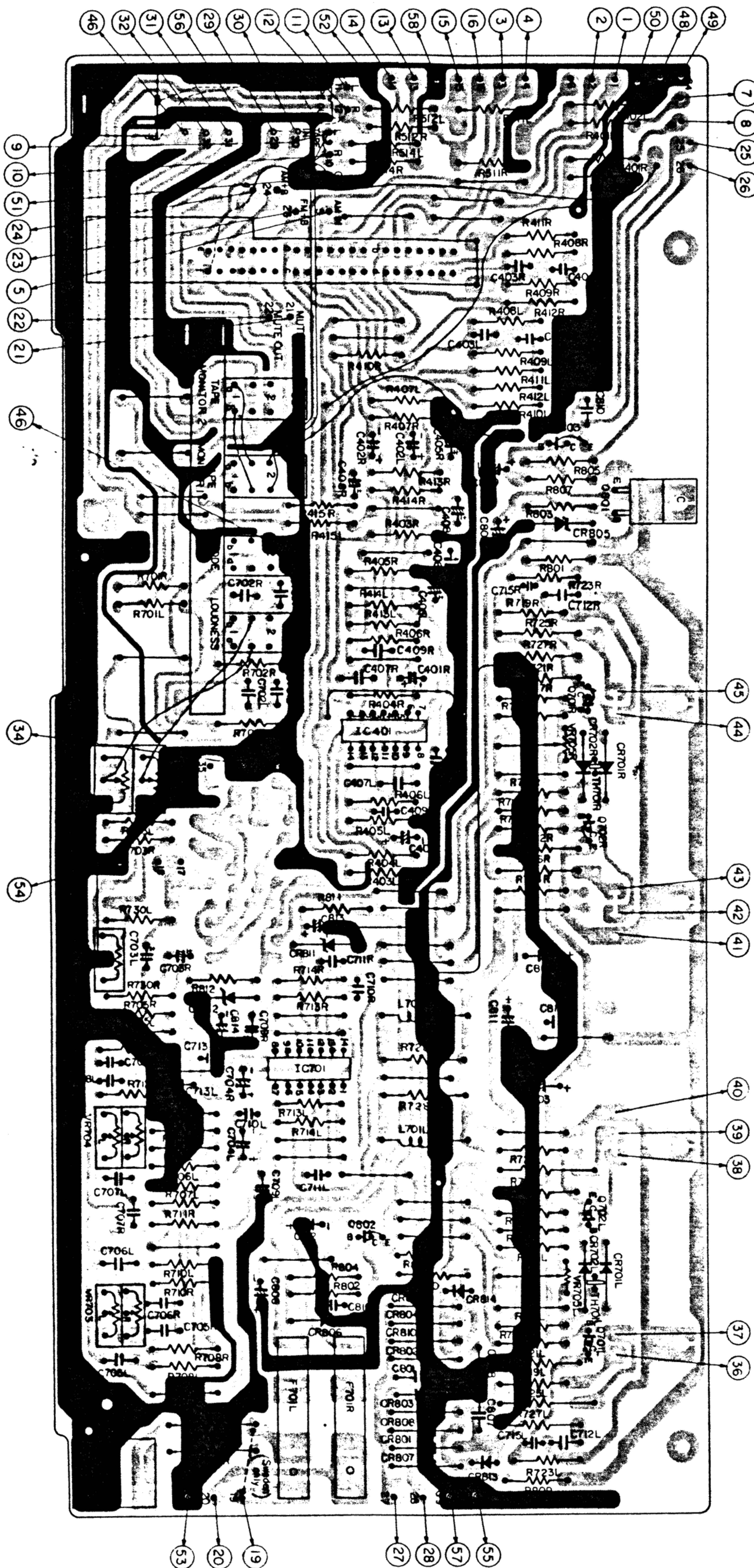


- ① POWER TRANSFORMER
- ③ POWER TRANSFORMER
- ⑧ DIAL POINTER
- ⑨ DIAL POINTER
- ⑮ TUNER PRINTED WIRING BOARD ⑬
- ⑯ AUDIO PRINTED WIRING BOARD ⑳

10. TUNER CIRCUIT DIAGRAM



13. SR-502 AUDIO PRINTED WIRING BOARD



- ① PHONO INPUT (L)
- ② PHONO INPUT (R)
- ③ FM INPUT (L)
- ④ FM INPUT (R)
- ⑤ AM INPUT

- ⑦ AUX INPUT (L)
- ⑧ AUX INPUT (R)
- ⑨ TAPE-1 INPUT (L)
- ⑩ TAPE-1 INPUT (R)
- ⑪ TAPE-1 OUTPUT (L)
- ⑫ TAPE-1 OUTPUT (R)
- ⑬ DIN TERMINAL (L)
- ⑭ DIN TERMINAL (R)
- ⑮ DIN TERMINAL (L)
- ⑯ DIN TERMINAL (R)

- ⑲ ROTARY SWITCH (S)
- ⑳ ROTARY SWITCH (S)
- ㉑ MUTE OUTPUT
- ㉒ MUTE GATE
- ㉓ FM +B (12.8V)
- ㉔ AM +B (12.8V)
- ㉕ TUNER +B (12.8V)
- ㉖ STEREO INDICATOR LAMP
- ㉗ POWER TRANSFORMER
- ㉘ POWER TRANSFORMER
- ㉙ TAPE-2 INPUT (L)
- ㉚ TAPE-2 INPUT (R)
- ㉛ TAPE-2 OUTPUT (L)
- ㉜ TAPE-2 OUTPUT (R)

- ⑳ EARTH
- ㉑ Q703L (BASE)
- ㉒ Q703L (EMITTER)
- ㉓ Q704L (BASE)
- ㉔ Q704L (EMITTER)
- ㉕ Q704L (COLLECTOR)
- ㉖ Q704L (COLLECTOR)
- ㉗ Q704L (BASE)
- ㉘ Q704L (EMITTER)
- ㉙ Q703L (BASE)
- ㉚ Q703L (EMITTER)
- ㉛ TUNER PRINTED WIRING BOARD (15)

- ⑳ EARTH
- ㉑ EARTH
- ㉒ EARTH
- ㉓ EARTH
- ㉔ EARTH
- ㉕ EARTH
- ㉖ EARTH
- ㉗ EARTH
- ㉘ EARTH
- ㉙ EARTH
- ㉚ EARTH

14. SR-502 AUDIO CIRCUIT DIAGRAM

