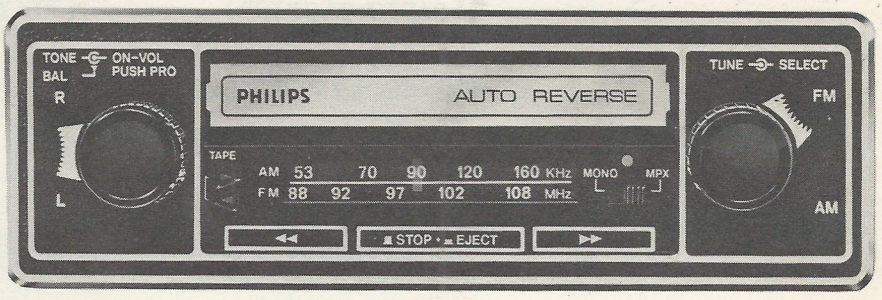
Car radio cassette player AC666A.

Service
Service
Service



Service Manual

12 V

4-TRACK AUTO REVERSE CASSETTE STEREO PLAYER WITH AM/FM/FM STEREO RADIO

WARNING
CONNECT POWER LEAD OF RECEIVER TO POSITIVE BATTERY TERMINAL ONLY. RECEIVER WILL BE DAMAGED IF CONNECTED TO INCORRECT POLARITY.

March 1977.

Subject to modification
3102 305 32041
Printed in Australia

PHILIPS

SPECIFICATIONS

	(RADIO SECTION)	(PLAYER SECTION)
TUNING RANGE	AM: 515 to 1605 KHz FM: 88 to 108 MHz	
INTERMEDIATE FREQUENCY	AM: 455 KHz FM: 10.7 MHz	
SENSITIVITY	AM: 26 dB or better (at 0.5 watt output) FM: 20 dB or better (at S/N 30 dB)	
No. OF TRACKS		4 track - 2 channels.
TAPE CARTRIDGE		Stereo/Monaural Compact Cassette.
TAPE SPEED		$1\frac{7}{8}$" P.S. (4.75 cm/sec)
FREQUENCY RESPONSE . .		125 to 6,300 Hz.
CROSSTALK		40 dB or better between adjacent tracks. 25 dB or better between right and left channels.
WOW & FLUTTER		0.4% or less (W.R.M.S.)
POWER OUTPUT	3.5 watts min. R.M.S. (at T.H.D. = 10%) per channel.	
SPEAKER IMP.	4 ohms per channel.	
POWER INPUT	12 volt battery, negative terminal to earth.	
Voltage	13.2 V.D.C.	
Current	Approx. 0.6 amps (at 0.5 watt output)	
TRANSISTORS & I.C.'s	9, plus 5 I.C.'s and 15 diodes.	

STEREO (MULTIPLEX) DETECTOR ADJUSTMENT

*Measuring Instrument: Frequency Counter

1. Connect frequency counter to R_{29} as shown in Fig. 12.
2. Adjust the variable resistor R_{22} to get 19 kHz $\pm$570 Hz on the counter.

Remarks:

If a frequency counter is not provided, follow the procedure as follows;

Tune in a stereo broadcast station carefully, turn the variable resistor R_{22} slowly from one end to the other. While the resistor is turned, stereo indicator lamp lights then the light goes out by turning the resistor in the same rotation. Set the resistor R_{22} at the center position of lighting range.

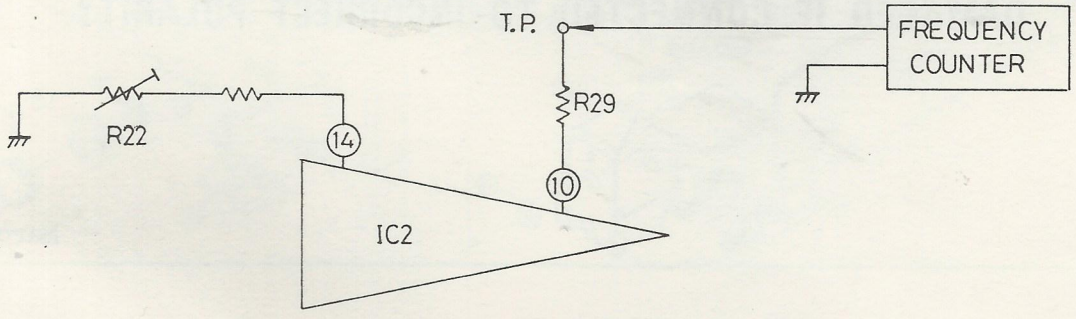


Fig. 12

BLOCK DIAGRAM

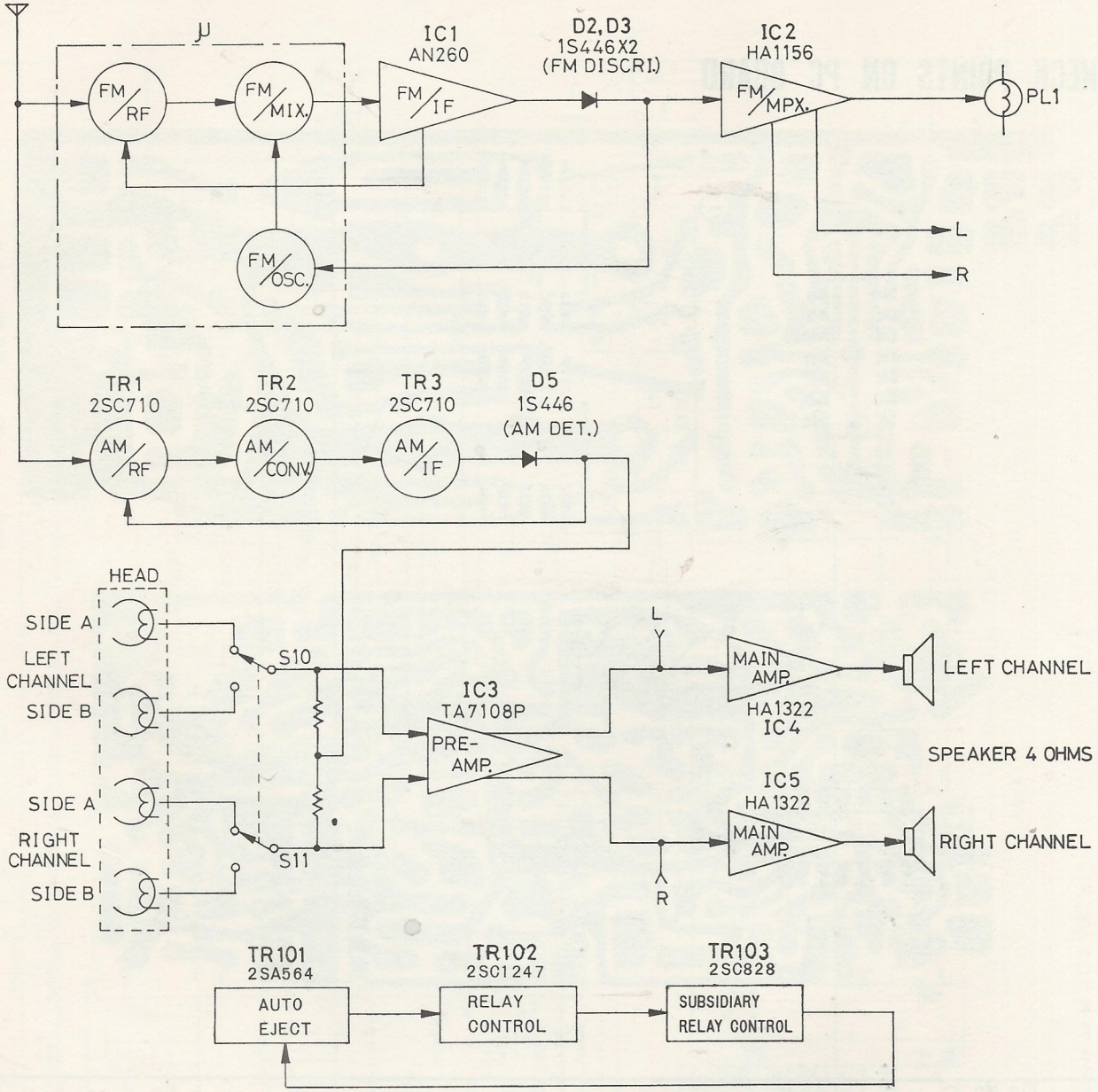


Fig. 1

IC & TRANSISTOR BASE CONNECTIONS

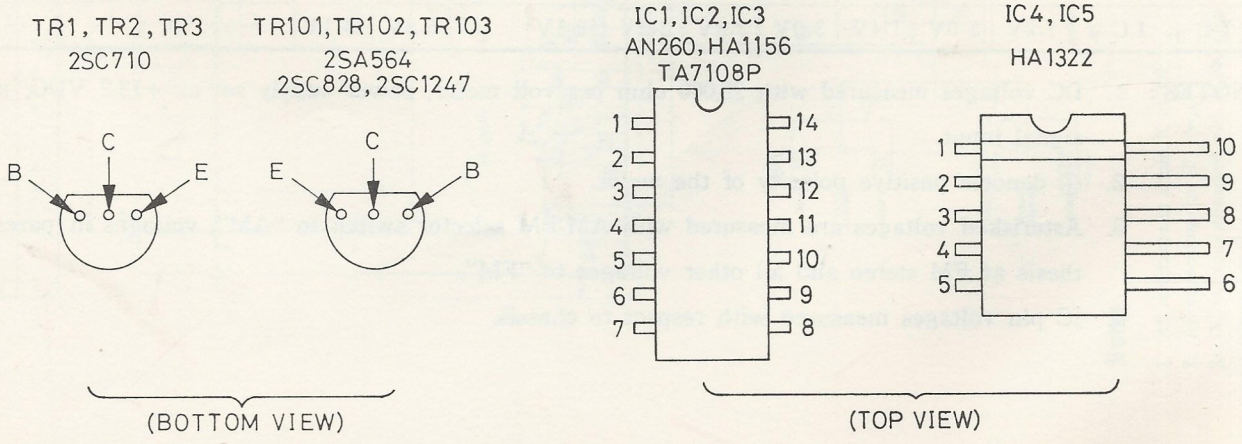


Fig. 2

CHECK POINTS ON PC BOARD

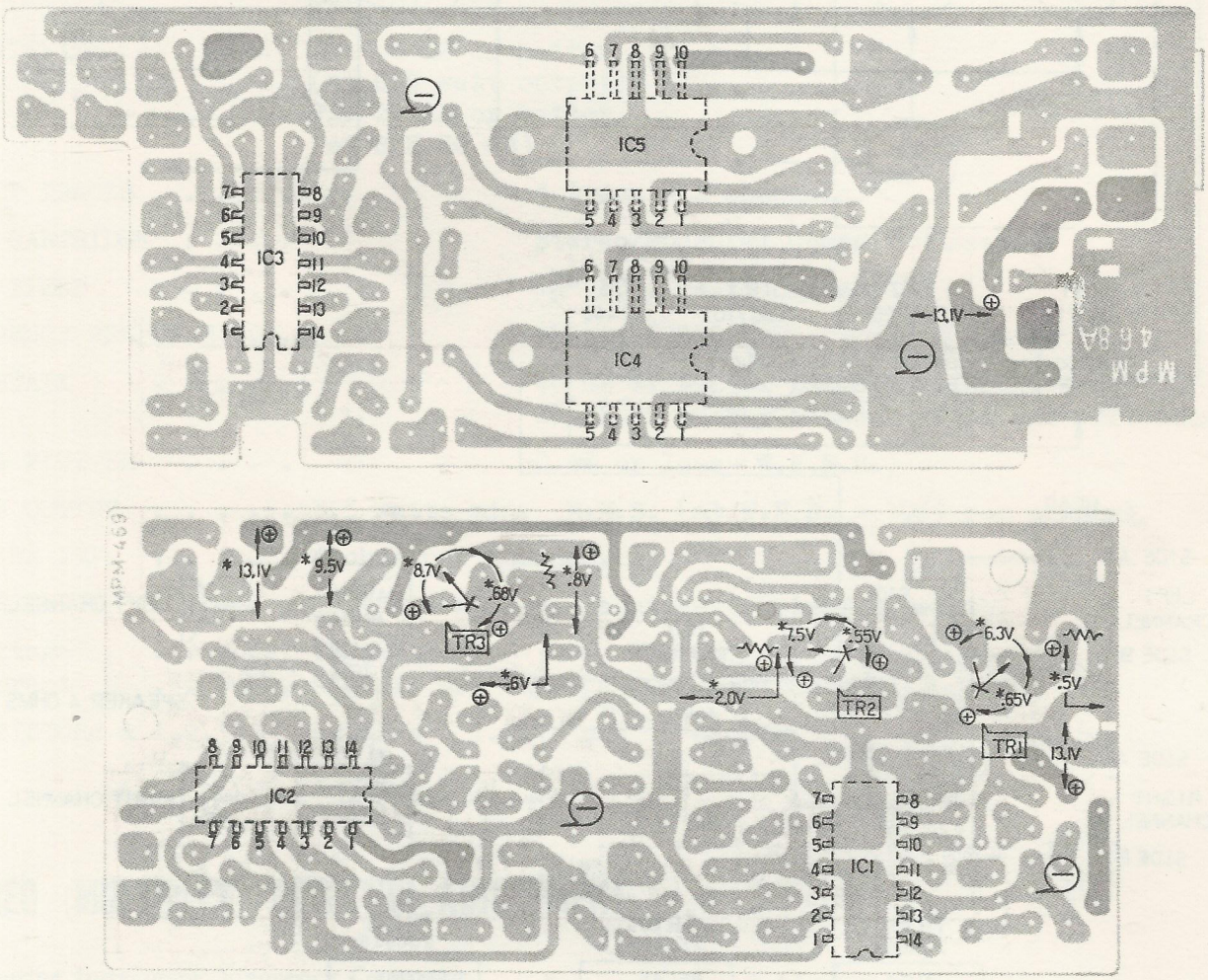


Fig. 3

IC \ Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC 1	6.5V	.9V	1.3V	—	—	—	4.4V	5.0V	.7V	5.6V	.7V	—	—	.7V
IC 2	13.1V (13.1V)	2.5V (2.5V)	5.5V (5.5V)	8.0V (8.0V)	8.0V (8.0V)	13.0V (1.0V)	— (—)	— (2.0V)	2.1V (2.1V)	1.6V (1.6V)	2.3V (2.3V)	2.3V (2.3V)	2.3V (2.3V)	3.2V (3.2V)
IC 3	8.4V	2.0V	.6V	0V	.7V	4.5V	9.3V	—	4.5V	.7V	0V	.6V	2.0V	8.4V
IC 4, IC 5	1.2V	8.0V	1.4V	3.0V	3.8V	3.2V	12.1V	—	6.8V	13.1V	—	—	—	—

NOTES:

1. DC voltages measured with 25,000 ohm per volt meter, power supply set at +13.2 VDC, no signal input.
2. ⊕ denotes positive polarity of the meter.
3. Asterisked voltages are measured with AM-FM selector switch to "AM", voltages in parenthesis at FM stereo and all other voltages to "FM".
4. IC pin voltages measured with respect to chassis.

WIRING DIAGRAM

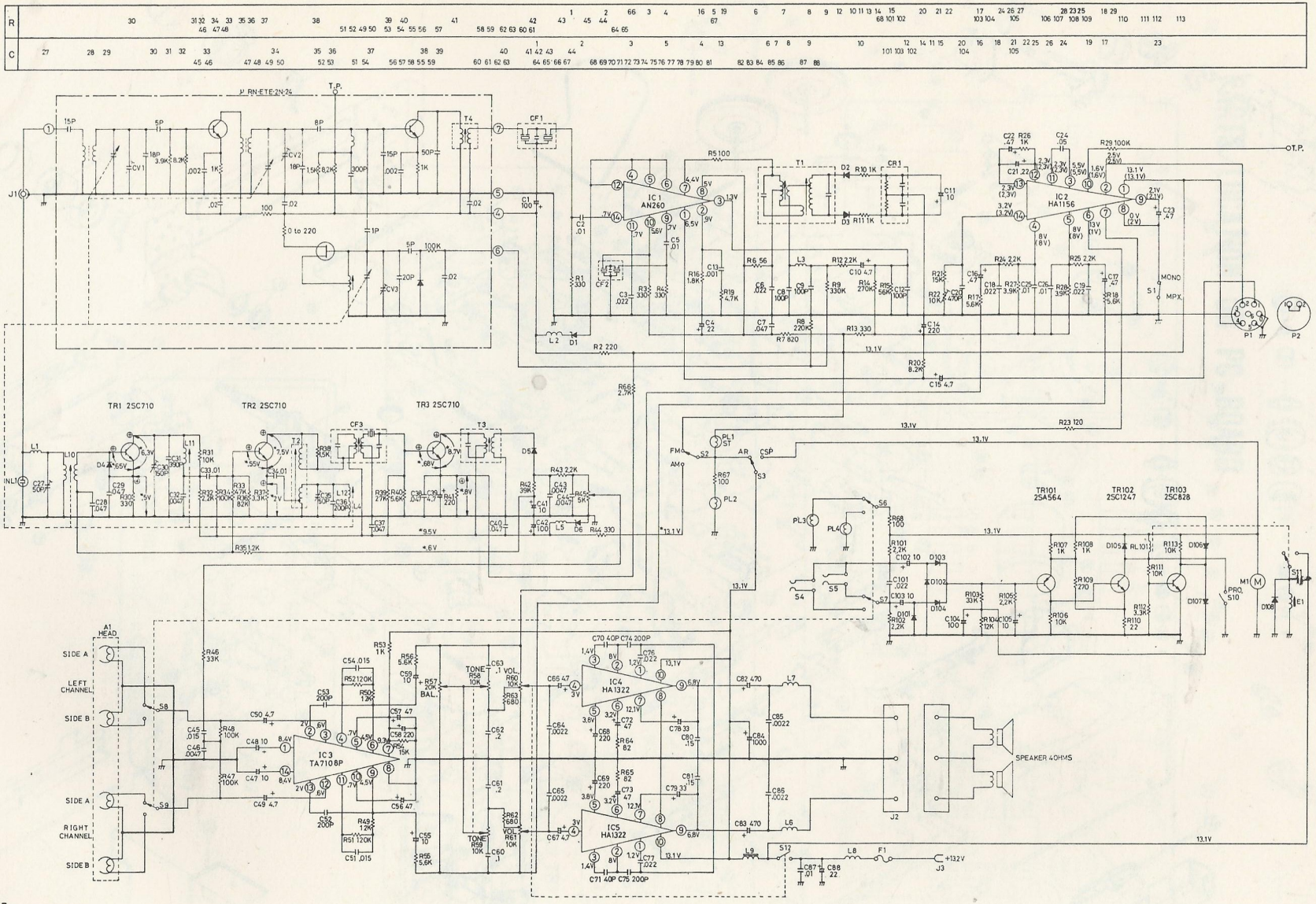


Fig. 4

Notes-

1. All resistance in ohms, K=1,000.
2. All capacitance in μF, P=$\mu\mu$F.
3. DC voltages measured with 25,000 ohm per volt meter, power supply set at +13.2 VDC, no signal input.
4. Asterisked voltages are measured with AM-FM selector switch to "AM", voltages in parenthesis at FM STEREO and all other voltages to "FM".

EXPLODED VIEW

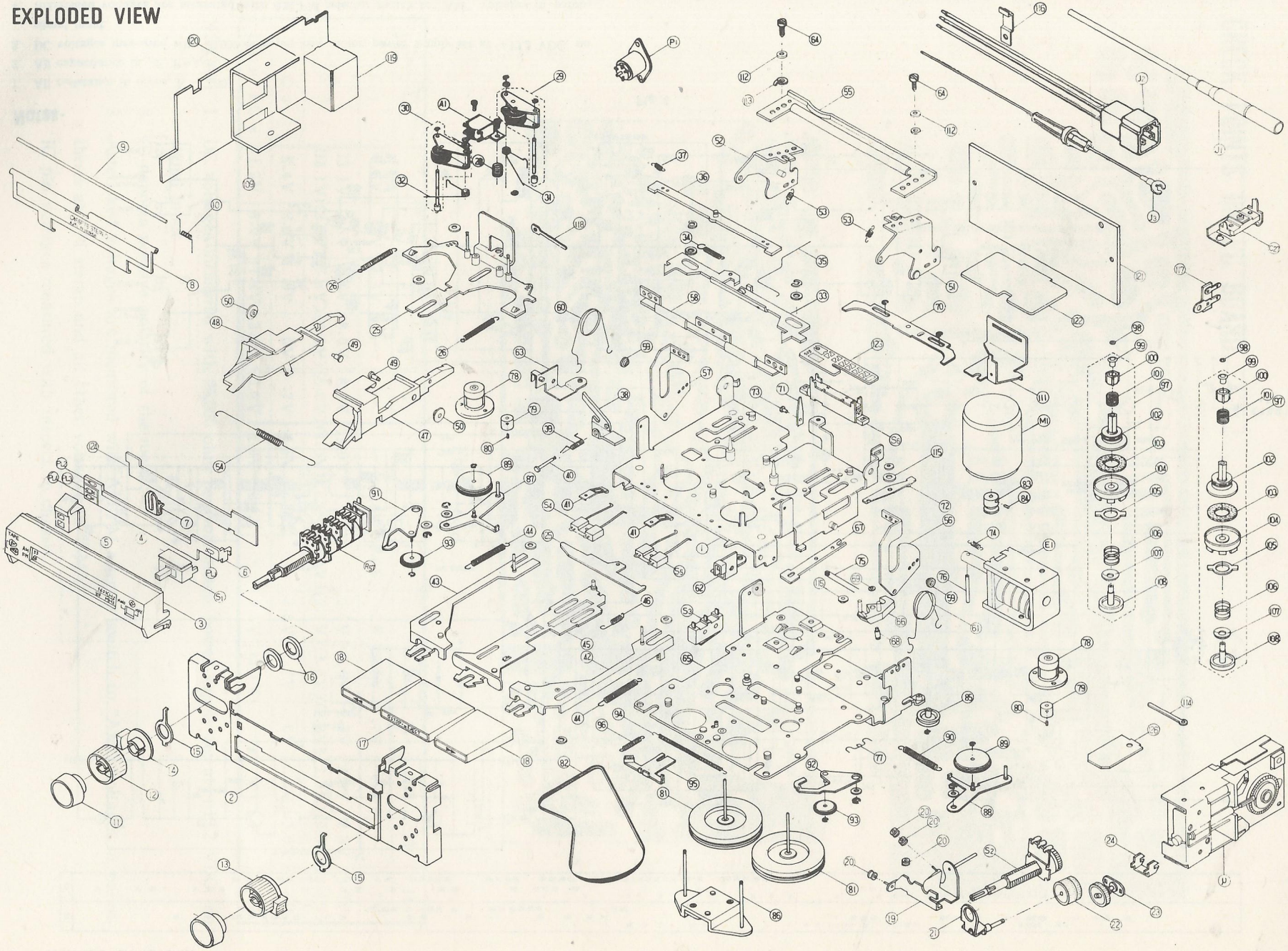


Fig. 6

PARTS LOCATION ON PC BOARD

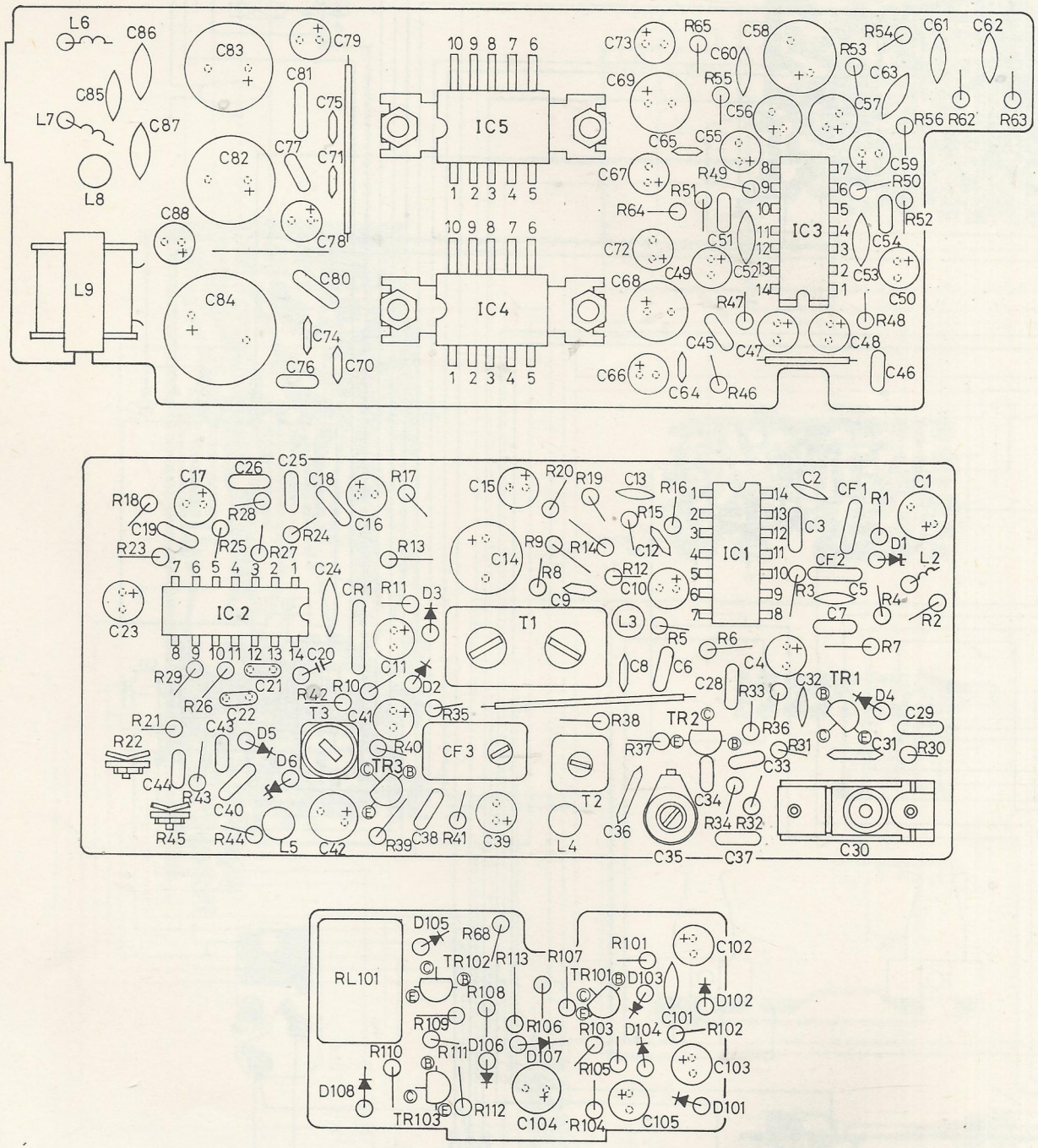


Fig. 7

AM ALIGNMENT

1. Measured output voltage with AC meter connected to speaker terminal or 4-ohm dummy load resistor.
2. Set AM-FM selector to AM. Turn volume and tone control to maximum (clockwise position)
3. Set signal generator for 30% modulation at 400 Hz. Set generator level to produce between one and three volts on meter and readjust generator level as required, during alignment, to keep output voltage in this range.

STEP	GENERATOR CONNECTION	GENERATOR FREQUENCY	ADJUST	PROCEDURE
	AM-IF ALIGNMENT			
1	Thru coupling circuit to antenna socket	455 kHz	CF_3, T_3	Set tuner to high-end stop. Adjust for maximum meter reading.
	TUNING FREQUENCY RANGE			
2	Thru dummy antenna to antenna socket	1660 kHz	C_{35}	Set tuner to high-end stop. Adjust for maximum meter reading.
3	Same as step 2	510 kHz	T_2	Set tuner to low-end stop. Adjust for maximum meter reading.
4	Repeat steps 2 and 3 until no further gain in output can be obtained.			
	AM-RF ALIGNMENT			
5	Thru dummy antenna to antenna socket	1400 kHz	C_{30}	Set tuner to generator frequency. Adjust for maximum meter reading.
6	With radio in car, antenna fully extended, tune in a weak station near 1400 kHz. Readjust antenna trimmer C_{27} for maximum volume.			

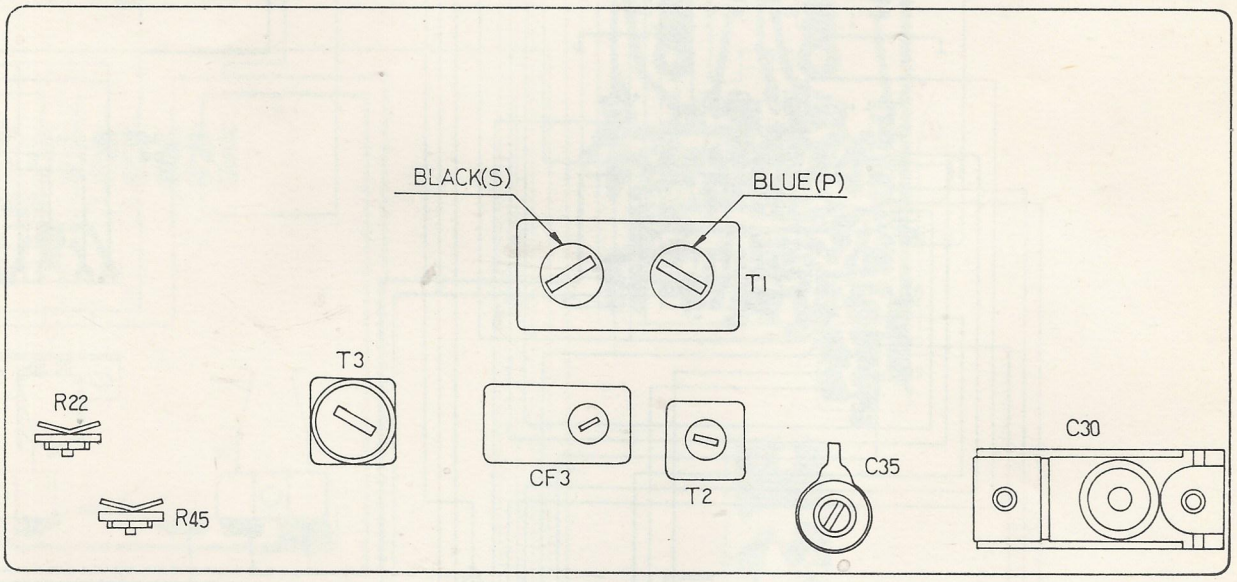


Fig. 8

FM ALIGNMENT

1. Alignment is performed at the factory with laboratory test equipment. The circuits are quite stable and not ordinarily subject to drift; before alignment, the receiver should be thoroughly checked for circuit troubles.
2. Input voltage to this receiver must be kept within 13.2 VDC ± 10%.
3. Set AM-FM selector to FM. Set tuner to high-frequency-end stop.
4. Turn volume and tone control to maximum (clockwise position).

◎ IF alignment (Refer to Fig. 8 for "ADJUST" points and Fig. 8 & 11 for connection of measuring instruments.)

As connected in Fig. 11, align as follows, observing S-curve on the oscilloscope.

STEP	PURPOSE	ADJUST	PROCEDURE
1	S-curve	T_1, T_4 (blue) (primary side)	Adjust for full gain and length at linears.
2	S-curve	T_1 (black) (secondary side)	Keep S-curve straight at the center, and adjust waveform for best symmetry of S-curve against the axis.
3	Repeat STEP 1 to 2.		

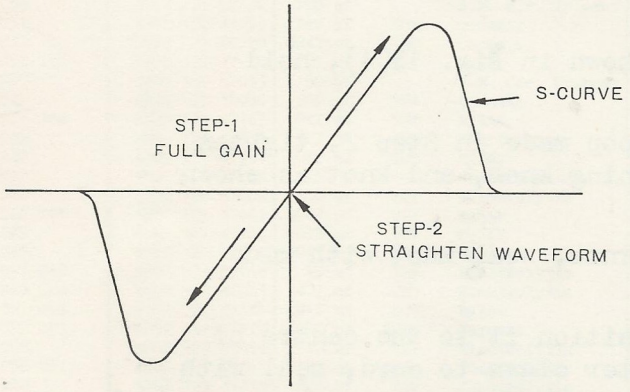


Fig. 9

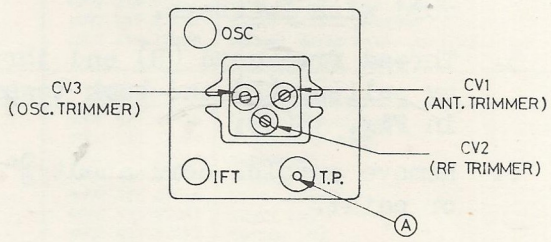


Fig. 10

Tracking alignment (Refer to Fig. 10 for "ADJUST" points. For this alignment, SSG is needed.)
After setting frequency range to the specified frequency, align sensitivity.

STEP	PURPOSE	ADJUST	PROCEDURE
1	Tuning frequency range	CV_3	87.5 MHz must be received at left end of dial.
2	108 MHz must be received at right end of dial.		
3	Tracking	CV_1, CV_2	Top sensitivity obtained at 98 MHz.

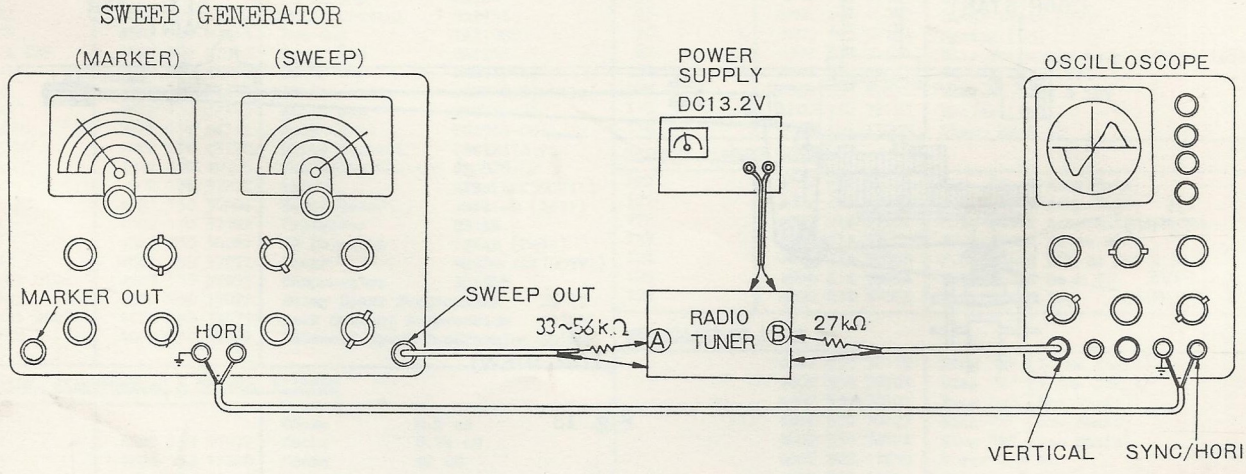


Fig. 11

REPLACEMENT OF DIAL CORD

1. Fully turn the tuning knob to left hand stop position.
2. Prepare a length of cord approx. $23\frac{5}{8}$" long (use only cord 0.4 mm (1/64" dia.)
   Knot end as shown in Fig. 1.
   To tighten knot pull (A) end.
3. Starting with the loop in position, refer Fig. 13(4), thread in direction of arrows.
4. Wind cord around tuning shaft as shown in Fig. 13(4), hold cord with tweezers.
5. Thread free cord (B) end through loop made in Step 2, tighten by pulling (B) end back towards tuning knob, and knot as shown in Fig. 13(3).
6. Remove surplus cord about $\frac{3}{8}$" from knob, seal knot with glue or paint.
7. Attach dial pointer to cord and position it to the centre of figure '5' at 530 KHz, secure pointer claws to cord, seal with glue.

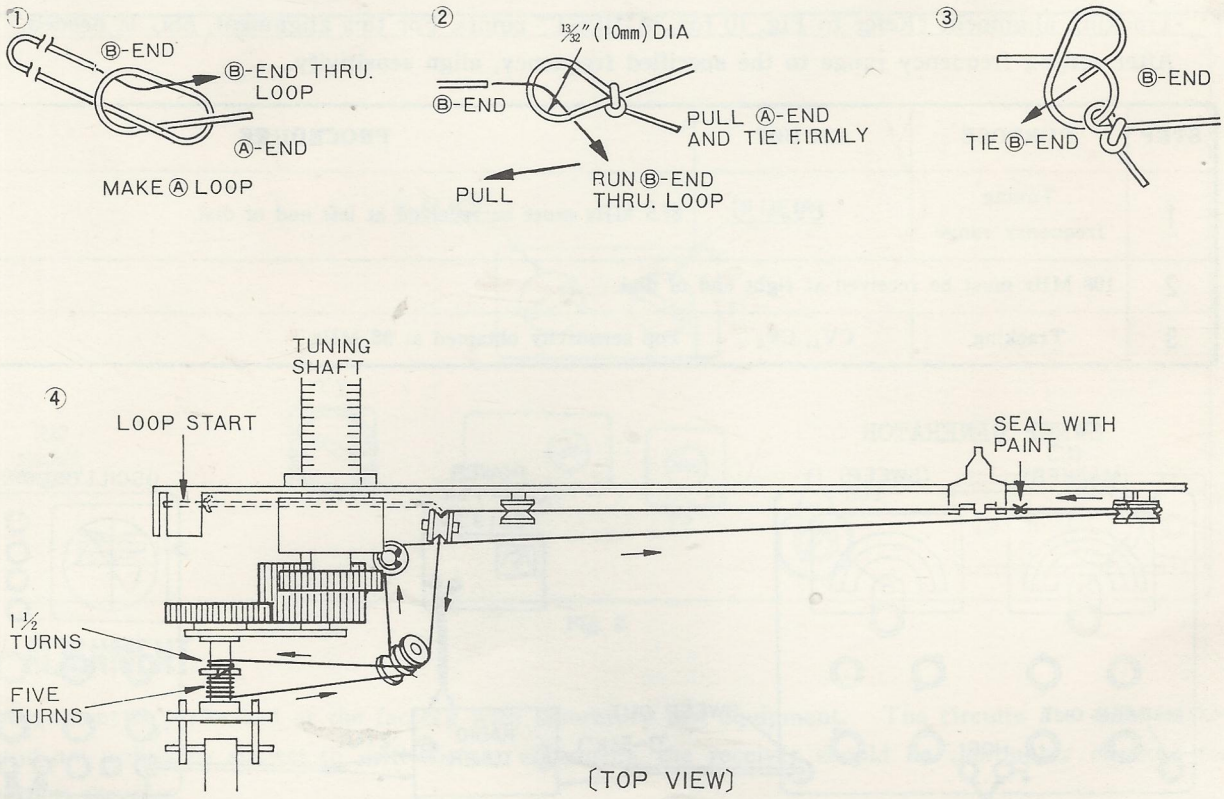


Fig. 13

REPLACEMENT PARTS LIST

SYMBOL NO.	CODE NO.	DESCRIPTION.
CAPACITORS		
C1	4802 124 47002	100 uf 10V Electrolytic
C2 C5	4822 122 30043	.01 uf 50V Ceramic
C3 C6	4802 121 47163	.022 uf 50V Mylar
C4	4802 124 47021	22 uf 16V Electrolytic
C7	4802 121 47167	.047 uf 50V Mylar
C8 C9	4802 122 37061	100 pf 50V Ceramic
C10	4802 124 47034	4.7 uf 25V Electrolytic
C11	4802 124 47044	10 uf 16V Electrolytic
C12	4802 122 37061	100 pf 50V Ceramic
C13	4802 122 47022	.001 uf 50V Ceramic
C14	4802 124 47018	220 uf 16V Electrolytic
C15	4802 124 47034	4.7 uf 25V Electrolytic
C16 C17	4802 124 47065	.47 uf 50V Electrolytic
C18 C19	4802 124 47163	.022 uf 50V Mylar
C20	4822 122 30034	470 pf 50V Styrol
C21	4802 124 47087	.22 uf Alox
C22	4802 124 47014	.47 uf 10V Alox
C23	4802 124 47065	.47 uf 50V Electrolytic
C24	4802 121 47167	.05 uf 12V Ceramic
C25 C26	4802 122 47028	.01 uf 50V Mylar
C27	4802 125 57033	50 pf A.M. ANT. Trimmer
C28 C29	4802 121 47167	.047 uf 50V Mylar
C30	4802 125 57032	150 pf A.M. R.F. Trimmer
C31	4802 122 47095	390 pf 50V Ceramic
C32	4822 122 30128	.0047 uf 50V Ceramic
C33 C34	4802 122 47028	.01 uf 50V Mylar
C35	4802 125 57033	50 pf A.M. Osc. Trimmer
C36	4822 122 30094	200 pf 50V Ceramic
C37 C38	4802 121 47167	.047 uf 50V Mylar
C39	4802 124 47034	4.7 uf 25V Electrolytic
C40	4802 121 47167	.047 uf 50V Mylar
C41	4802 124 47044	10 uf 16V Electrolytic
C42	4802 124 47002	100 uf 10V Electrolytic
C43 C44	4802 121 47064	.0047 uf 50V Mylar
C45	4802 121 47161	.015 uf 50V Mylar
C46	4802 121 47064	.0047 uf 50V Mylar
C47 C48	4802 124 47044	10 uf 16V Electrolytic
C49 C50	4802 124 47034	4.7 uf 25V Electrolytic
C51 C54	4802 121 47161	.015 uf 50V Mylar
C52 C53	4802 122 47077	200 pf 500V Ceramic
C55	4802 124 47044	10 uf 16V Electrolytic
C56 C57	4802 124 47061	47 uf 6.3V Electrolytic
C58	4802 124 47018	220 uf 16V Electrolytic
C59	4802 124 47044	10 uf 16V Electrolytic
C60 C63	4802 122 47055	.1 uf 12V Ceramic
C61 C62	4802 122 47109	.2 uf 12V Ceramic
C64 C65	4822 122 30114	.0022 uf 50V Ceramic
C66 C67	4802 124 47034	4.7 uf 25V Electrolytic
C68 C69	4802 124 47006	220 uf 16V Electrolytic
C70 C72	4822 122 31069	40 pf 50V Ceramic
C72 C73	4802 124 47061	47 uf 6.3V Electrolytic
C74 C75	4822 122 30094	200 pf 50V Ceramic
C76 C77	4802 121 47163	.022 uf 50V Mylar
C78 C79	4802 129 47013	33 uf 10V Electrolytic
C80 C81	4802 121 47173	.15 uf 50V Mylar
C82 C83	4802 124 47024	470 uf 16V Electrolytic
C84	4802 124 47051	1000 uf 16V Electrolytic
C85 C86	4802 122 30114	.0022 uf 50V Ceramic
C87	4822 122 30043	.01 uf 50V Ceramic
C88	4802 124 47021	22 uf 16V Electrolytic
C101	4822 122 30103	.022 uf 25V Ceramic
C102 C103	4802 124 47044	10 uf 16V Electrolytic
C104	4802 124 47002	100 uf 10V Electrolytic
C105	4802 124 47044	10 uf 16V Electrolytic
C106	4822 122 30043	.01 uf 50V Ceramic

IC's TRANSISTORS & DIODES			
IC1	4802 209 87074	FM-IF Amp	AN260
IC2	4802 209 87075	Multi Control	HA1156
IC3	4802 209 87036	Pre-amp	TA7108P
IC4 IC5	4802 209 87062	Power amp	HA1322
TR1	4822 130 44195	AM RF amp	2SC710-E)
TR2	4822 130 44195	AM Converter	2SC710-C)BF494
TR3	4822 130 44195	AM IF amp	2SC710-D)
TR101	5322 130 44315	Auto eject	2SA564-PQ
TR102	4802 130 47175	Relay Control	2SC1247A-VS
TR103	4822 130 40965	Sub Relay Control	2SC828-QR
D1	4802 130 37072	Zener	HZ9A(BZX70C9V1)
D2 D3	4822 130 30281	Radio Detector	IS446-D (0A91)
D4	4802 130 37022	Protector	SR1K2
D5	4822 130 30281	AM Detector	IS446 (0A91)
D6	4802 130 37072	Zener	MZ209(BZX70C9V1)
D101 D104	4802 130 37033	Compensator	IS1555
D105	4802 130 37022	Relay Spark Suppression	SR1K2
D106 D107	4802 130 37033	Back Current Suppression	IS1555
D108	4802 130 37022	Solenoid Spark Suppression	SR1K2

COILS, TRANSFORMERS & CERAMIC FILTERS			
L1		Choke	8.2 uH
L2	4802 158 17077	Choke	0.74 uH
L3	4802 158 17098	Choke	68 uH
L4	4802 158 17099	Coil Osc.	5.6 uH
L5	4802 158 17099	Choke	5.6 uH
L6 L7	4802 158 17077	Choke	0.74 uH
L8	4802 158 17042	Choke	50 uH
L9	4802 152 27028	Choke filter	3 mH
T2	4802 156 27084	AM Osc.	
T3	4802 153 17143	AM-IF	455 KHz
CF1 CF2	4802 242 77006	Filter	10.7 MHz
CF3	4802 242 77002	Filter	455 KHz

RESISTORS AND CONTROLS		
R57-R61 S10 S12	4802 102 57004	Balance Control 20K ohm Tone 10K ohm Volume 10K ohm

Note: Resistors are $\frac{1}{8}$ watt 5% Type 'C'
R2 R23 R44 R67 $\frac{1}{2}$ watt 10% Type 'S'
R66 R68 R107 R108 $\frac{1}{4}$ watt 5% Type 'C'

MISCELLANEOUS ELECTRICAL		
A1	4802 249 37005	Playback head.
CR1	4802 214 57056	Module Assy. radio detector
E1	4802 281 57007	Solenoi
F1	4802 253 47006	Fuse 3 amp
J1	4802 320 17018	Receptacle Antenna
J2	4802 321 27113	3 pin Connector and Lead Assy. Speaker
J3	4802 321 27157	Terminal and Lead Assy. 'A' inc. fuse holder
M1	4802 361 27037	D.C. Motor (with 83 & 84)
NL1	4822 134 20016	Neon Lamp
P1	4822 267 40045	Connector 6 pin.
P2	4802 263 67005	Connector 6 pin Short
PL1 PL2	4802 134 47068	Lamp dial
PL3 PL4	4802 134 47068	Lamp
RL101 S11	4802 280 87005	D.C. Relay
S1	4802 277 27037	Slide switch STEREO/MONAURAL
S2	4802 273 37007	Switch AM/FM Selector
S3	4802 271 37008	Micro Switch Radio/Player
S4 S5	4802 278 97031	Leaf Switch Auto reverse
S6-S9	4802 277 67012	Slide Switch program
	4802 210 17068	Manual Tuner Assy. inc.Coil Assy. AM and FM tuner

ILLUS. NO.	CODE NO.	DESCRIPTION
1	4802 691 27018	Chassis Tape Deck
3	4802 331 37024	Dial Plate Assy
5	4802 325 27034	Supporter
7	4802 450 87078	Pointer dial
8	4802 423 47016	Door Cassette
9	4802 535 97091	Shaft (8)
10	4802 492 37117	Spring (8)
11	4802 413 37133	Knob Vol, tune, ON/OFF
12	4802 413 97133	Knob, tone
13	4802 411 57017	Knob AM/FM
14	4802 411 57018	Knob balance
17	4802 410 27061	Button Stop and eject
18	4802 410 27062	Button fast forward
CASSETTE DECK.		
28	4802 492 37146	Spring
29	4802 403 47013	Pinch roller Assy. right
30	4802 403 47014	Pinch roller Assy. left
31	4802 492 67179	Spring (29)
32	4802 492 67181	Spring (30)
44	4802 492 37149	Spring (42) & (43)
46	4802 492 37151	Spring (45)
69	4802 532 57073	Washer (66)
77	4802 492 67184	Spring (67 & 70)
78	4802 520 17018	Housing (81)
79	4802 535 27002	Roller (81)
80	4802 502 10908	Screw (81) 2 x 3mm
81	4802 528 67024	Fly Wheel
82	4802 358 27003	Belt
84	4802 502 17038	Screw (83)
85	4802 535 27002	Roller Belt
87	4802 403 27017	Lever left F.F. idler
88	4802 403 27018	Lever right F.F. idler
89	4802 528 77034	Roller (87 & 88)
90	4802 492 37152	Spring (87 & 88)
93	4802 528 77035	Roller (91 & 92)
95	4802 403 17013	Lever brake (97)
96	4802 492 37154	Spring (95)
97	4802 528 27631	Slip Mechanism assy. (99 to 108)
98	4802 532 57071	Washer Cap. (97)
109	4802 255 47037	Radiator IC4 & IC5
115	4802 462 77153	Roller (66)
116	4802 401 17088	Clamp J2 & J3
PRINTED CIRCUIT BOARD.		
120	4802 214 57048	P.C. Board Assy.Main
121	4802 214 57049	P.C. Board Assy.Radio
122	4802 214 57051	P.C. Board Assy.Auto reverse
123	4802 214 57052	P.C. Board S6 to S9
124	4802 214 57053	P.C. Board PL1 to PL4 & S1
125	4802 214 57054	P.C. Board S4 & S5
126	4802 214 57055	P.C. Board R67

MISCELLANEOUS PARTS.		
	4802 530 70119	Ring "E" (1.2mm Shaft)
	4802 530 70121	Ring "E" (1.5mm Shaft)
	4802 530 70122	Ring "E" (2mm Shaft)
	4802 530 70123	Ring "E" (3mm Shaft)
	4802 530 70124	Ring "E" (4mm Shaft)
	4822 502 11059	Screw 2 x 4
	4822 502 11084	Screw 2.6 x 3
	4822 502 11189	Screw 3 x 4
	4822 502 11064	Screw 3 x 6
	4802 532 57075	Washer
	4822 532 10333	Washer 4mm
	4822 530 80075	Washer 3mm
	4822 505 10325	Nut 3mm
	4802 505 17027	Nut 9.5mm Vol.& Tuning Shaft
	4822 502 11132	Bolt 6 x 16
	4802 532 57086	Washer

WIRING ON PC BOARD

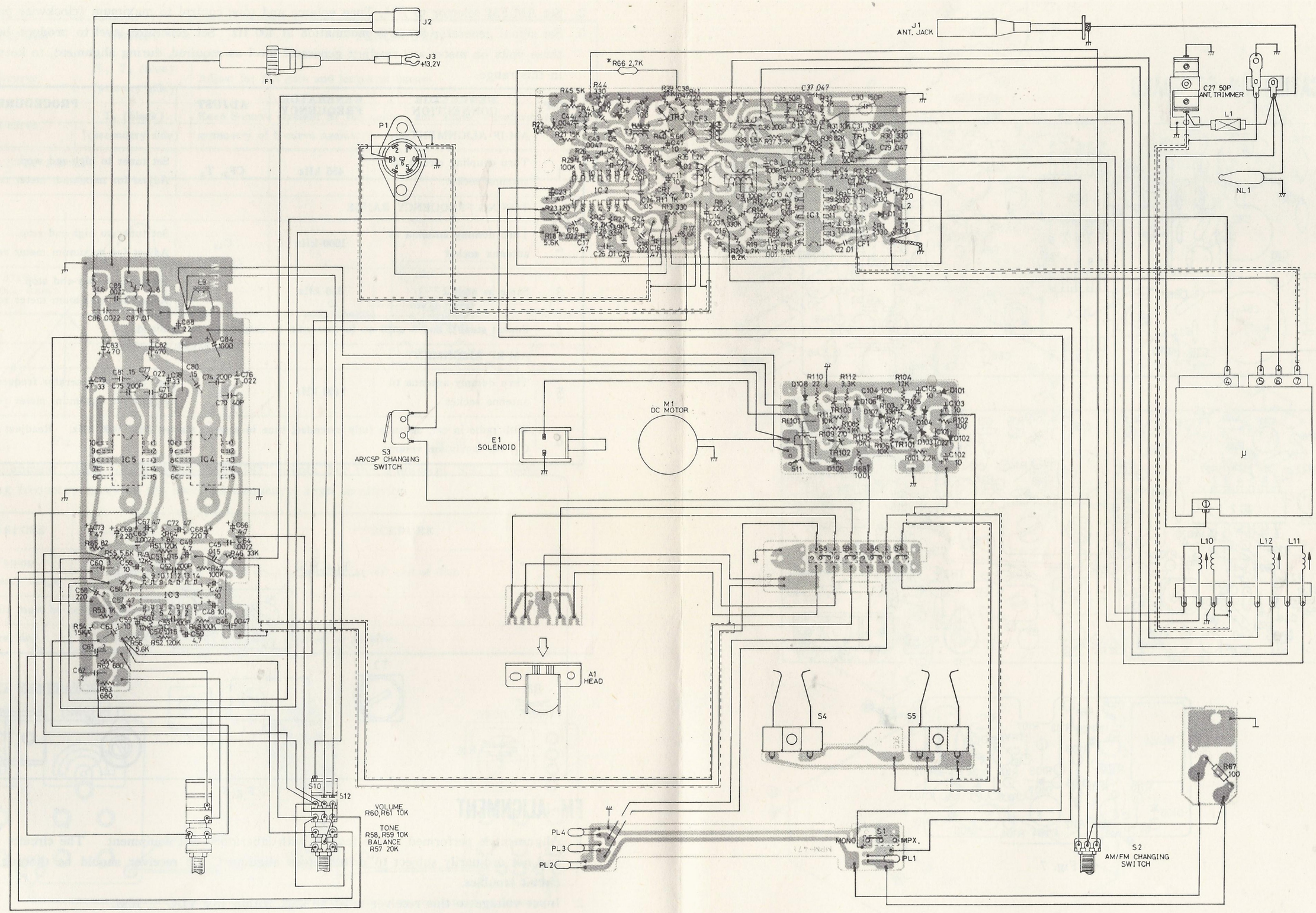


Fig. 5

NOTES: 1. All resistance in ohms, K=1,000.

2. All capacitance in μF, P=$\mu\mu$F.