Service
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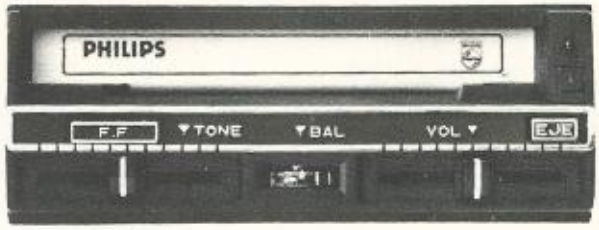


Service Manual

12 V

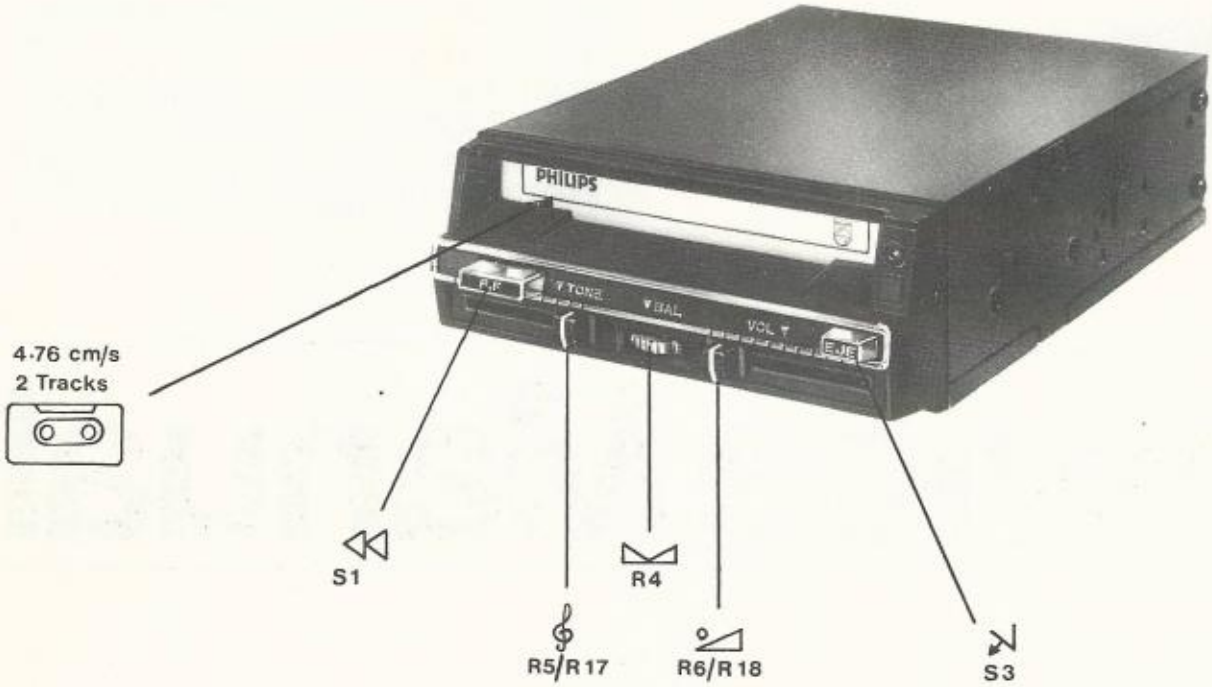
SPECIFICATIONS

NUMBER OF TRACKS	4-track 2 channel
TAPE CARTRIDGE	Stereo/Monaural compact cassette
TAPE SPEED	4.75 cm/sec. (1⅞ i. p. s.)
FREQUENCY RESPONSE	125 to 6,300 Hz
CROSSTALK	40 dB or better between adjacent tracks 25 dB or better between left and right channels
WOW & FLUTTER	0.4% or less (WRMS)
POWER INPUT	12-volt car battery, negative terminal to ground
Voltage	13.2 VDC
Current	Approx. 0.7 ampere (at 0.5 watt output)
POWER OUTPUT	3 watts min. RMS (at T. H. D.=10%) per channel
SPEAKER IMPEDANCE	4 ohms
TRANSISTORS & IC's	5, plus 3 IC's and 9 diodes

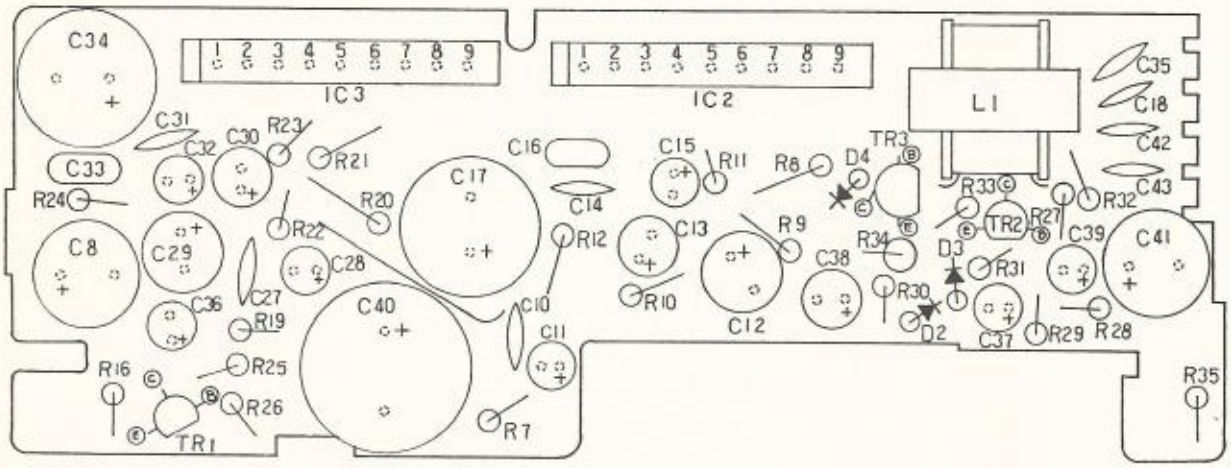
Subject to modification
3102 305 31861
December 1975
Printed in Australia

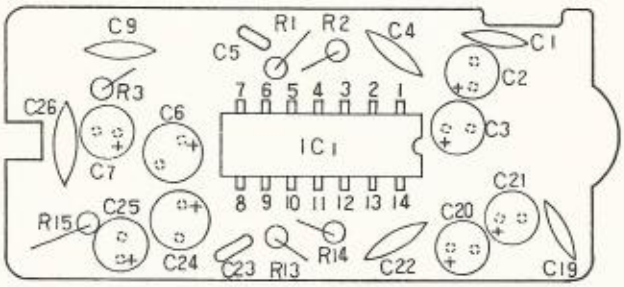
PHILIPS

LOCATION OF CONTROLS

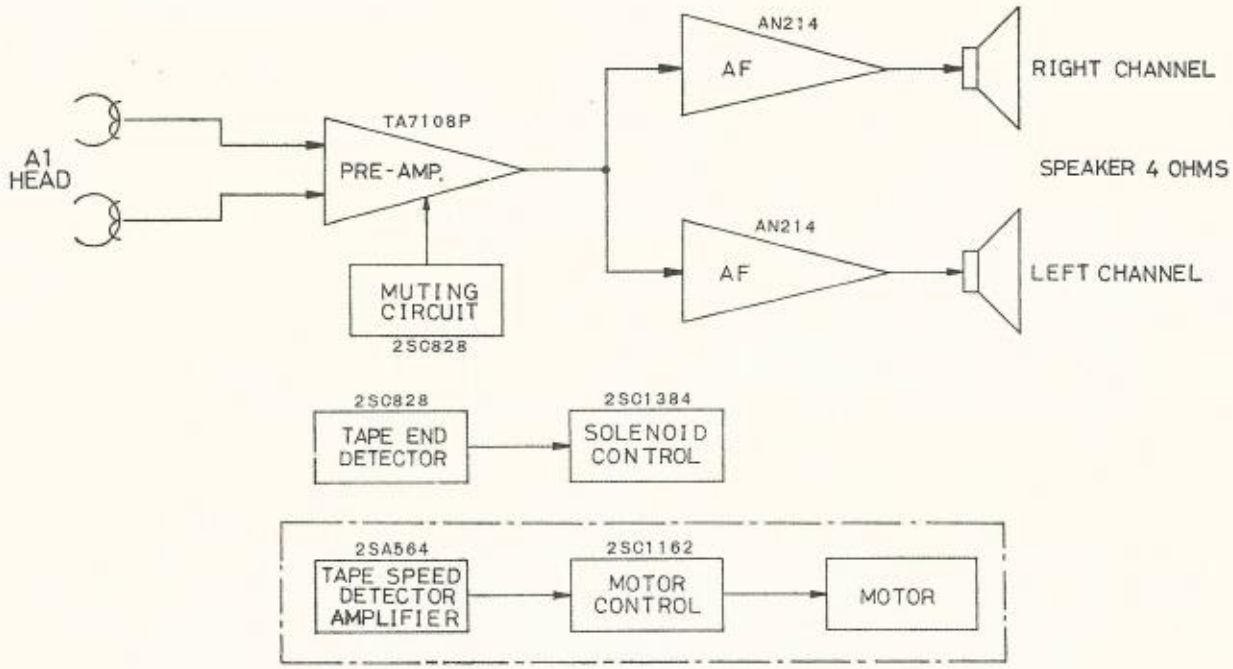


PARTS LOCATION ON PC BOARD

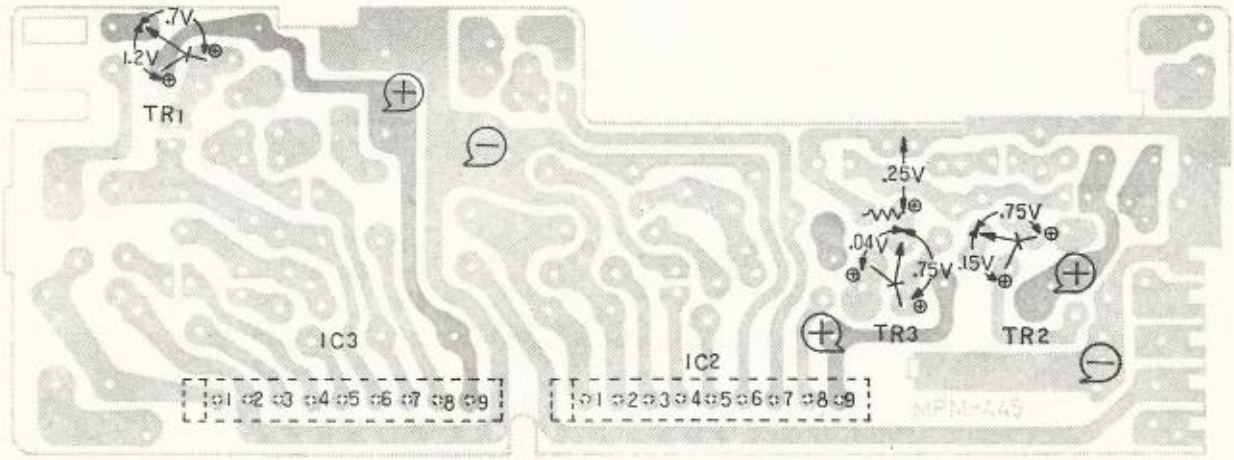


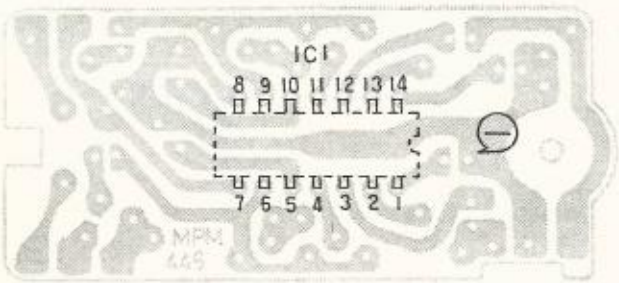


BLOCK DIAGRAM



CHECK POINTS ON PC BOARD





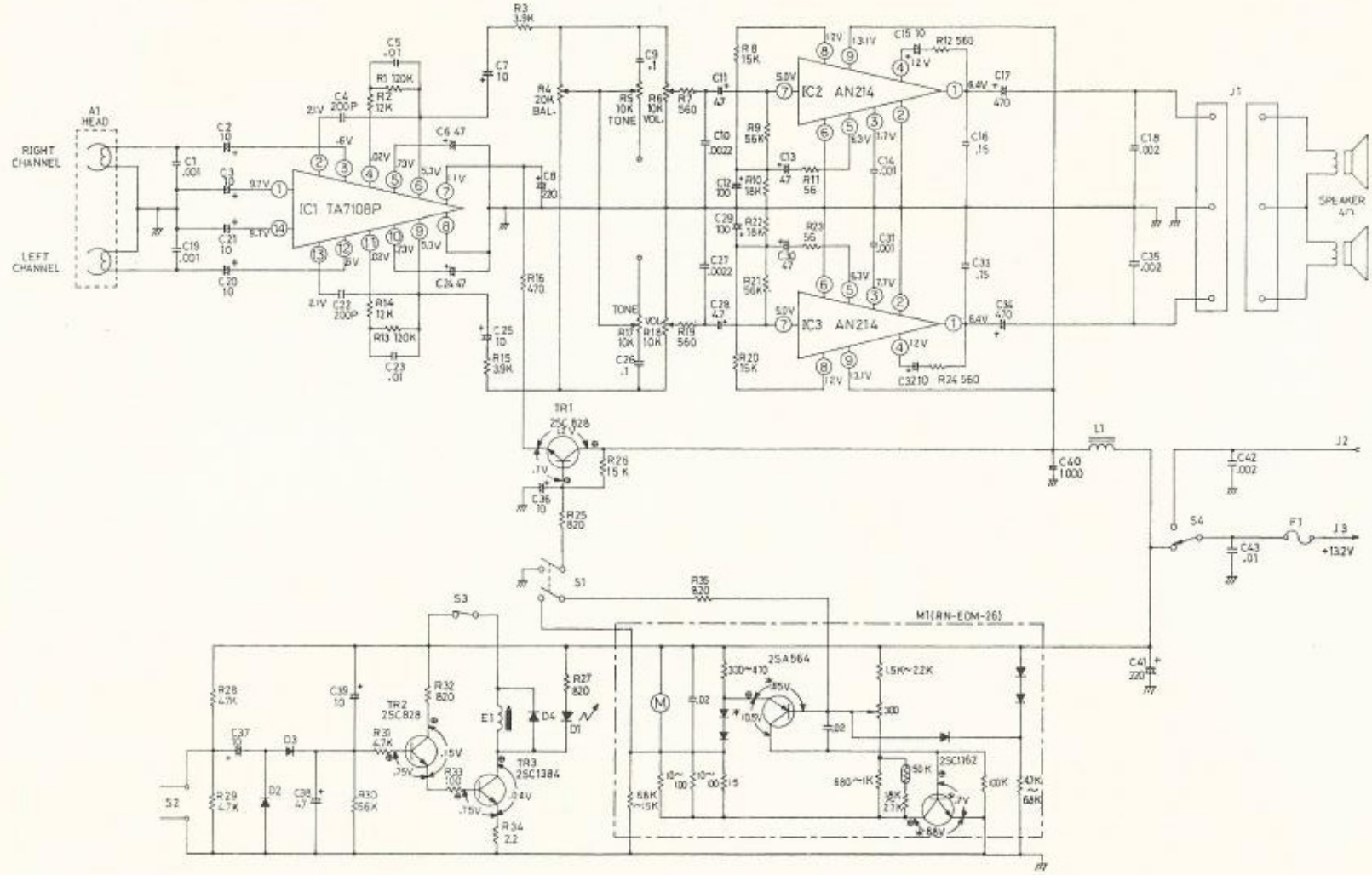
IC \ Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC 1	9.7V	2.1V	.6V	.02V	.73V	5.3V	11V	—	5.3V	.73V	.02V	.6V	2.1V	9.7V
IC 2, IC 3	6.4V	—	7.7V	12V	6.3V	—	5V	12V	13.1V	—	—	—	—	—

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. IC PIN VOLTAGES MEASURED WITH RESPECT TO CHASSIS.

SCHEMATIC



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. IC PIN VOLTAGES MEASURED WITH RESPECT TO CHASSIS.
5. ASTERISKED VOLTAGES MAY VARY DUE TO SOME VARIATION IN PRODUCTION OF MOTOR(M_1).

ADJUSTMENT OF PINCHROLLER PRESSURE

The tension of the spring securing the pinchroller can be adjusted by repositioning the end of the spring as shown in *figure 7*. Normally the pinchroller pressure is between 300 and 400 grams, where the spring is positioned at "C". Moving the spring to position "A" or "B" will increase the pinchroller pressure and to "D" or "E" will reduce it. Each step will vary the pressure by about 60 grams.

ADJUSTMENT OF TAKE-UP TORQUE

With the supply voltage at 13.2 volts the torque on the take-up turntable should be between 40 and 70 gm. cm. Normally the spring (a) is in the position "C" as shown in *figure 8*. Moving the spring (a) to position "A" or "B" will increase the torque and to "D" or "E" will reduce it. Each step will vary the torque by 10 gm. cm.

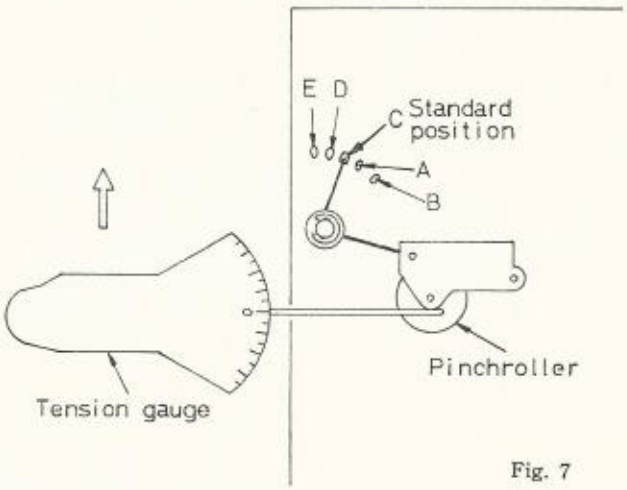


Fig. 7

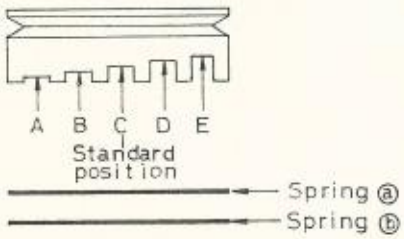
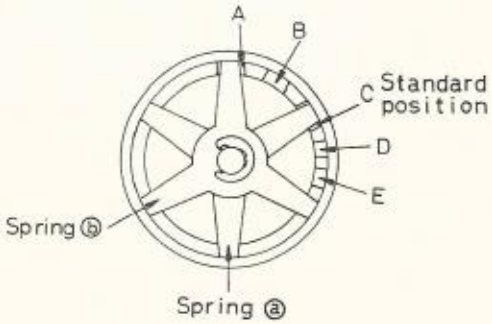


Fig. 8



ELECTRONIC SPEED CONTROL *(Figure 9 and 10)*

The speed of the motor is controlled by a bridge circuit. This is maintained at 2,200 r.p.m. If the motor speed varies, the device is designed to vary the voltage applied to the motor inversely.

(1) If the motor terminal voltage (between (A) and (B)) increases the diodes D_1 and D_2 conduct, reducing the voltage at (B) and so maintaining 13.2 volts across the motor.
(2) As the diodes D_1 and D_2 conduct, the voltage at (C) is also reduced. The voltage drop across D_1 and D_2 will remain nearly constant.
(3) With the reduction of the voltage at (C) the internal resistance of the transistor TR_1 will increase.
(4) The voltage at (D) will increase, as the base current of TR_2 (which is equal to the collector current of TR_1) decreases and the internal resistance increases.
(5) To maintain the bridge at balance, the terminal voltage of the motor drops when the voltage at (D) increases, thus reducing the motor speed.

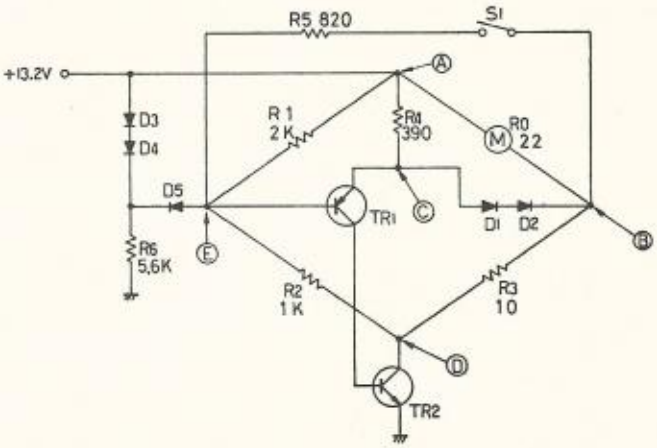


Fig. 9

FAST FORWARD *(Figure 9 and 10)*

Fast forward is achieved by applying a higher voltage to the motor.

(1) Fast forward function switch S_1 is closed, connecting R_5 and so increasing the base current of TR_1.
(2) The collector current of TR_1 increases as a result.
(3) The internal resistance of TR_2 reduces as the base current (which is equal to the collector current of TR_1) increases.
(4) Thus the voltage at (D) drops and the motor terminal voltage increases.

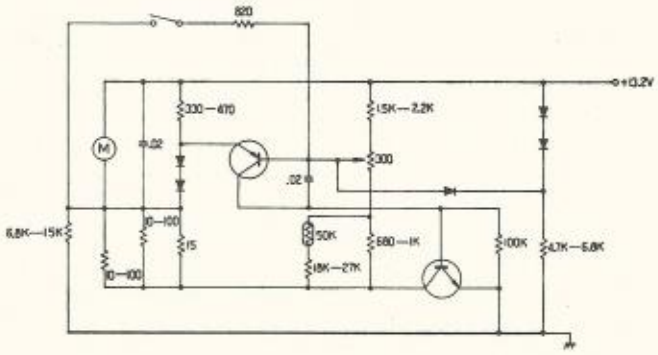


Fig. 10

START CIRCUIT *(Figure 9 and 10)*

The start circuit comprises D_3, D_4, D_5 and R_6 in *figure 9* and without which TR_2 will remain cut off when the power is applied. This circuit holds the voltage at (E) lower than (A), which causes TR_1 and TR_2 to conduct.

REPLACEMENT PARTS LIST

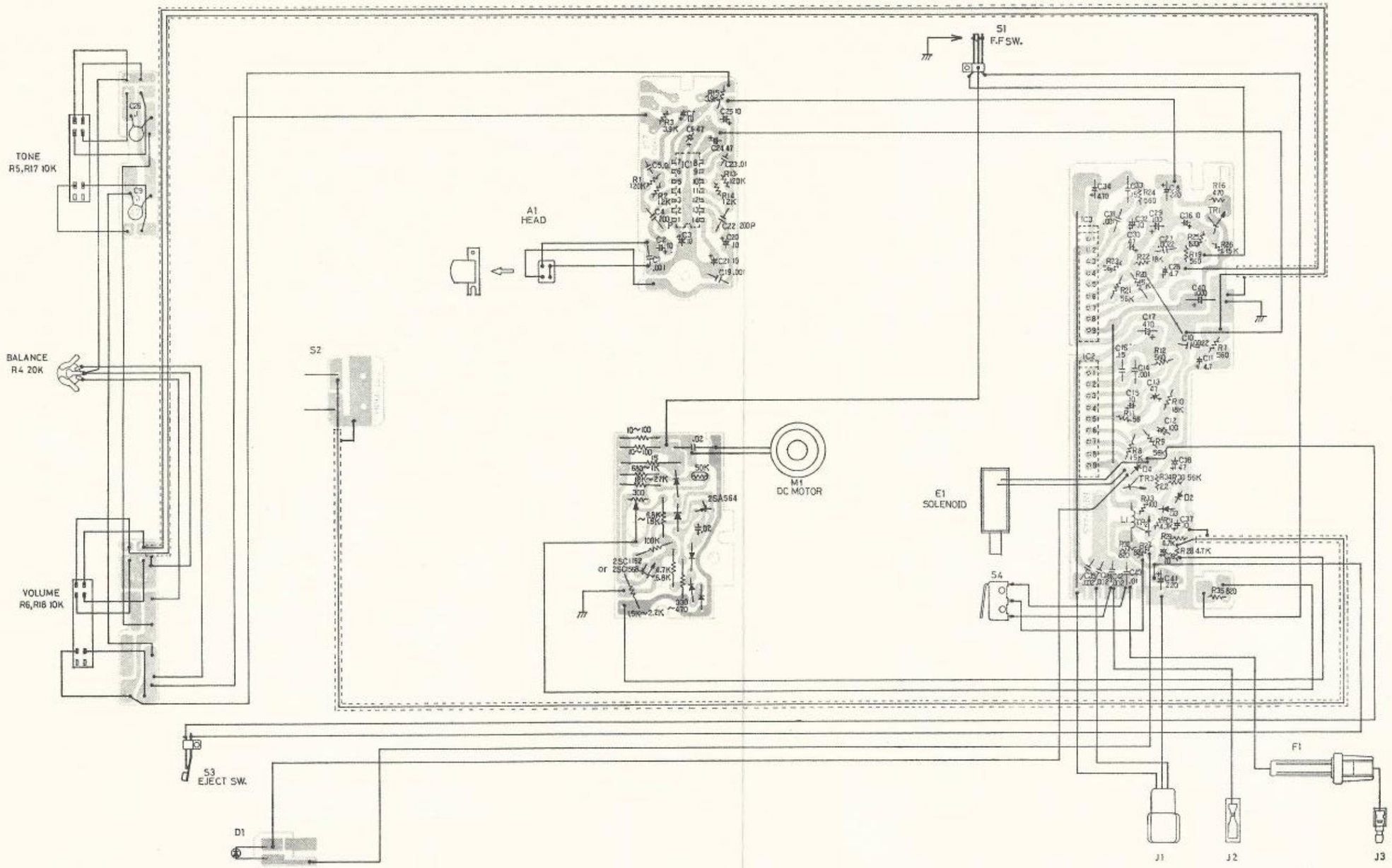
Symbol No.	PART NO.	DESCRIPTION		
Capacitors				
C1, C19	4802 122 47022	.001 uf	50V	ceramic
C2, C20	4802 124 47044	10 uf	16V	electrolytic
C3, C21	4802 124 47044	10 uf	16V	electrolytic
C4, C22	4802 122 47077	200 pf	500V	ceramic
C5, C23	4802 122 47028	.01 uf	50V	mylar
C6, C24	4802 124 47016	47 uf	10V	electrolytic
C7, C25	4802 124 47044	10 uf	16V	electrolytic
C8	4802 124 47018	220uf	16V	electrolytic
C9, C26	4802 122 47055	.1 uf	12V	ceramic
C10 C27	4822 122 30114	.0022uf	50V	ceramic
C11 C28	4802 124 47034	4.7 uf	25V	electrolytic
C12 C29	4802 124 47002	100 uf	10V	electrolytic
C13 C30	4802 124 47016	47 uf	10V	electrolytic
C14 C31	4802 122 47022	.001 uf	50V	ceramic
C15 C32	4802 124 47044	10 uf	16V	electrolytic
C16 C33	4802 121 47173	.15 uf	50V	mylar
C17 C34	4802 124 47024	470 uf	16V	electrolytic
C18 C35	4822 122 30114	.002 uf	50V	ceramic
C36 C37	4802 124 47044	10 uf	16V	electrolytic
C38	4802 124 47016	47 uf	10V	electrolytic
C39	4802 124 47044	10 uf	16V	electrolytic
C40	4802 124 47051	1000uf	16V	electrolytic
C41	4802 124 47018	220 uf	16V	electrolytic
C42	4822 124 30114	.002 uf	50V	ceramic
C43	4822 122 30043	.01 uf	50V	ceramic
RESISTORS				
R_4	4802 100 27006	Control, balance 20k ohm	variable resistor	
R_5, R_{17}	4802 105 17049	Control, tone 10k ohm	variable resistor	
R_6, R_{18}	4802 105 17051	Control, volume 10k ohm	variable resistor	
MISCELLANEOUS PARTS				
85	4802 401 17088	Clamp, J_1, J_2 and J_3		1
87	4802 535 37006	Rivet, 2×3mm, for ill. ⊛		1
88	4802 535 17005	Pin, 2×18mm, spring, for ill. E_1		1
	4802 530 70124	E type ring, snap (for 1.5mm shaft)		4
	4802 530 70122	E type ring, snap (for 2mm shaft)		6
	4802 530 70123	E type ring, snap (for 3mm shaft)		1

Symbol No.	Stock No.	Description
TRANSISTORS, IC's & DIODES		
TR 1	BC547	Muting circuit, silicon
TR 2	BC547	Tape end detector, silicon
TR 3	BC637	Solenoid control, silicon
IC 1	4802 209 87036	Pre-amp., linear-monolithic
IC 2, IC 3	4802 209 87019	Audio, power output, linear-monolithic
D 1	4802 130 37095	Light emitting diode
D 2, D 3	BAV21	Compensator, rectangular wave, silicon
D 4	OA636-1000	Spark suppression, solenoid, silicon
MISCELLANEOUS ELECTRICAL		
A 1	4802 249 37002	Playback head
M 1	4802 361 27025	DC motor (incls. motor control circuit)
E 1	4802 281 57004	Solenoid
F 1	4802 253 47006	Fuse, 3 amperes
S 1	4802 277 17028	Leaf switch, fast forward
S 3	4802 277 17029	Leaf switch, eject
S 4	4802 271 37008	Micro switch, radio/player changing
L 1	4802 152 27028	Choke, filter, 3mH
J 1	4802 321 27113	Connector and lead assy., speaker
J 2	4802 268 17012	Terminal and lead assy., "A" supply
J 3	4802 256 47001	Fuse holder with terminal and lead assy., "A" supply
	4822 322 20008	Cable, volume

Illus. No. (Fig. 6)	Stock No.	Description
CHASSIS		
1	4802 464 57016	Chassis, tape deck
2	4802 443 47001	Sub chassis, back cover
	4802 443 37003	Cover, top
	4802 443 57003	Cover, bottom
	4802 443 47002	Cover, side
STYLING		
5	4802 443 67022	Escutcheon
6	4802 411 67036	Button, volume and tone control
7	4802 413 27024	Knob, balance control
8	4802 410 17001	Button, eject
9	4802 410 17002	Button, fast forward
10	4802 459 27094	Door, cassette slot
11	4802 535 97073	Shaft, for ill. ⑩
12	4802 492 37117	Spring, for ill. ⑩
13	4802 403 57062	Supporter, volume, balance and tone control mounting
CASSETTE DECK		
20	4802 464 57017	Slide plate, DC motor mounting
22	4802 492 67155	Spring, cartridge depressing
23	4802 528 67022	Flywheel
24	4802 358 37029	Belt, drive
25	4802 403 57063	Supporter, for ill. ㉓

Illus. No. (Fig. 6)	Stock No.	Description
26	4802 532 17058	Spacer, for ill. ㉙
27	4802 403 57064	Supporter, for ill. ㉜
28	4802 535 97074	Shaft, for ill. S_2
29	4802 492 67156	Spring, for ill. S_2
30	4802 492 67157	Spring, for ill. S_2
31	4802 532 57071	Washer, for ill. ㉜
32	4802 528 17049	Slip mechanism
37	4802 532 57072	Washer, for ill. ㊳
38	4802 532 57073	Washer, for ill. ㊳
39	4802 528 27017	Roller, right
40	4802 528 27018	Roller, right
41	4802 492 37118	Spring, for ill. ㊳
42	4802 528 27019	Roller, for ill. ㊳
43	4802 532 57074	Spacer, for ill. ㊳
44	4802 358 37031	Belt, drive
45	4802 403 57065	Runner, right
46	4802 403 57066	Runner, left
47	4802 403 57067	Slide plate, head mounting
48	4802 530 77027	Washer, for ill. ㊼
49	4802 492 37119	Spring, for ill. ㊼
50	4802 532 17059	Spacer for ill. A_1
51	4802 492 67158	Spring, azimuth adjusting
52	4802 403 57068	Lever, eject
53	4802 492 37121	Spring, for ill. ㊷
54	4802 532 17061	Spacer, for ill. ㊷
55	4822 532 10215	Washer, 2.6mm, for ill. ㊹
56	4802 492 37122	Spring, for ill. ㊹
57	4802 532 17062	Spacer, for ill. ㊷
58	4802 403 47009	Pinchroller assy.
59	4802 532 57075	Washer, for ill. ㉙ and ㊽
61	4802 535 97075	Shaft, for ill. ㊽
64	4802 403 37014	Lever, for ill. ㊷
65	4802 535 97076	Shaft, for ill. ㊹
66	4802 466 97062	Insulator, for ill. S_4
67	4802 492 67159	Spring, S_4 mounting
68	4802 532 17063	Spacer, for ill. ㊷
69	4802 492 37123	Spring, for ill. ⑧
70	4802 255 47022	Radiator, IC_2 and IC_3
71	4802 466 97063	Spacer, for ill. M_1
PRINTED CIRCUIT BOARD		
75		PC board assy., main
76		PC board assy., pre-amp.
78		PC board, D_1
79		PC board, S_2
80		PC board, volume
81		PC board, tone

WIRING ON PC BOARD



NOTES: 1. ALL RESISTANCE IN OHMS, K=1,000.
2. ALL CAPACITANCE IN μF, P=$\mu\mu$F.
3. S_2 CONTACT POINT IS INCLUDED IN SLIP MECHANISM

3. ASTERISKED VOLTAGES MAY VARY DUE TO SOME VARIATION IN PRODUCTION OF MOTOR(M_1).

EXPLODED VIEW

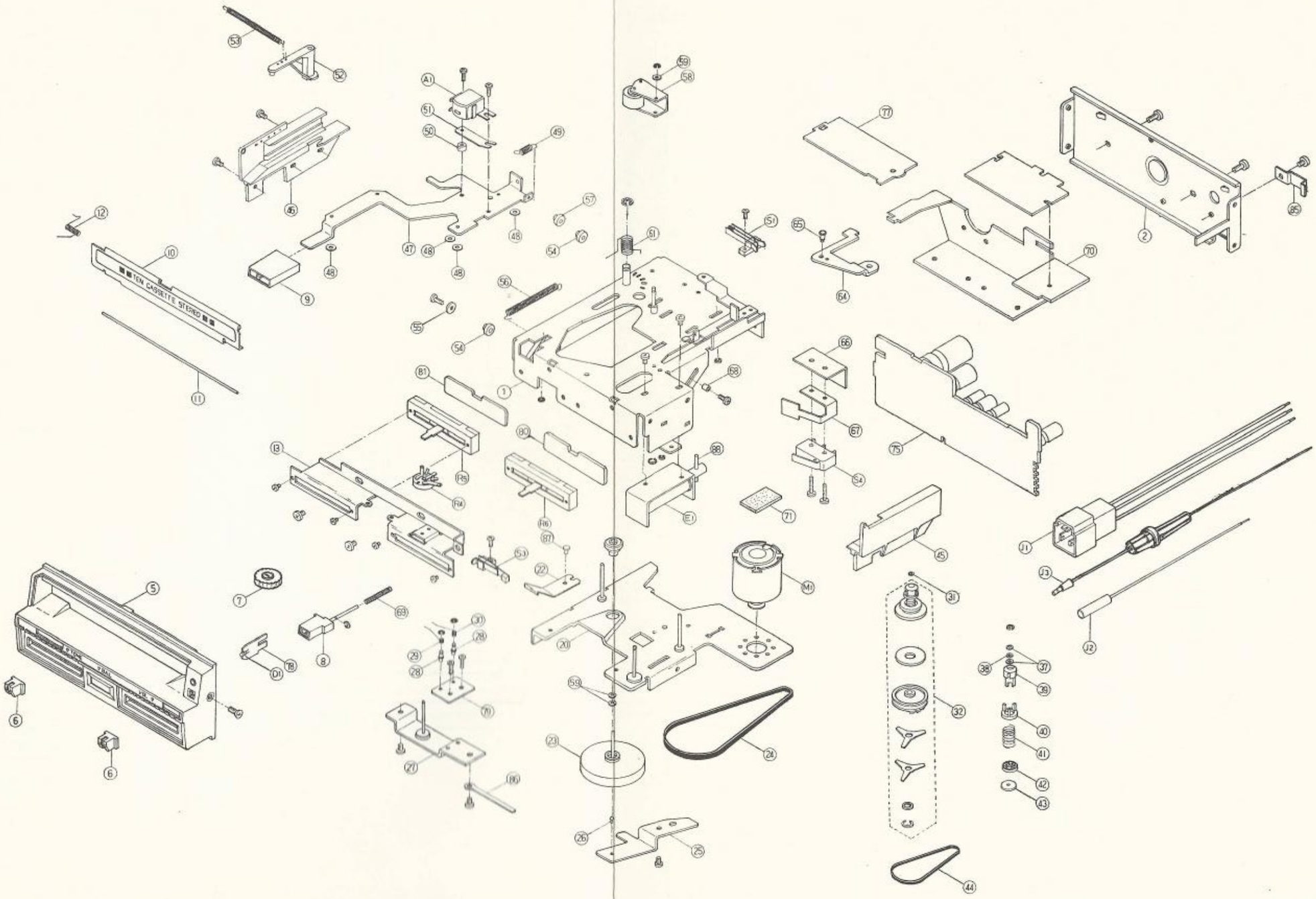


Fig 6