SP-311S1

CAR STEREO SERVICE MANUAL

4-TRACK AUTO REVERSE CASSETTE STEREO PLAYER

CUSTOM MADE FOR TOYOTA CELICA

TOYOTA PART NO. 86021-19105 (SP-311S1)

GENERAL

This custom-made auto-reverse cassette stereo player is designed specifically for use in TOYOTA CELICA in combination with the custom-made radio receiver.

NOTE: It is recommended to use 60-minute or 90-minute cassette, because 120-minute cassette tape is very thin and delicate.

TOYOTA MOTOR SALES CO., LTD.

COMPOSITION

TAPE PLAYER AND SETTING PARTS SET 86021-19105 (SP-311S1)	—Tape player assembly 86260-14080 (SP-311-1)	1
	—Finish panel 58862-14080 (RN-MEP-23)	1
	—Bracket, radio tuner, front(RH) 55366-14020 (RN-MBZ-104)	1
	—Bracket, radio tuner, front(LH) 55367-14020 (RN-MBZ-105)	1
	—Screw with washer 93319-15008 (RN-MCW-B5×8S)	2

◎For Hardtop model

SPEAKER ASSEMBLY 86160-19055 (SSB-4G13)	—Speaker assembly, radio 86160-12030 (SB-226)	2
	—Wiring sub assembly, speaker 86202-14011 (RN-EWJ-421)	1
	—Grille, speaker 64383-22011 (RN-MSD-96)	2
	—Screw with washer 93385-16016 (RN-MBW-C6×16S)	4
	—Nut, lock 90950-03062 (RN-MEN-3)	4
	—Nut, spring 90183-04046 (RN-MSQ-A4S)	12
	—Clamp 90463-04133 (RN-MCE-21)	4

◎For Liftback model

SPEAKER ASSEMBLY 86160-19065 (SSB-4G14)	—Speaker assembly, radio 86160-14040 (SB-259)	2
	—Screw with washer 90159-40064 (F6-SW2NA-4×16S-M-ZN2A)	8

NOTE: Model numbers in parethesis denote FUJITSU TEN's numbers.

SPECIFICATIONS

NUMBER OF TRACKS	4-track 2 channels
TAPE CARTRIDGE	Stereo/Monaural compact cassette
TAPE SPEED	4.75 cm/sec. (1 7/8 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 OUTPUT	3.5 watts min. RMS (at T.H.D.=10%) per channel
SPEAKER IMPEDANCE	4 ohms per channel
POWER INPUT	12-volt car battery, negative terminal to ground
Voltage	13.2 VDC
Current	Approx. 0.7 ampere (at 0.5 watt output)
	Approx. 4.5 amperes (at solenoid action)
TRANSISTORS & IC's	7, plus 3 ICs and 9 diodes
DIMENSIONS	150(W)×50(H)×162(D)mm (5 29/32", 1 31/32", 6 3/8")
WEIGHT	Player—1.9 kg (4.2 lbs.)

BLOCK DIAGRAM

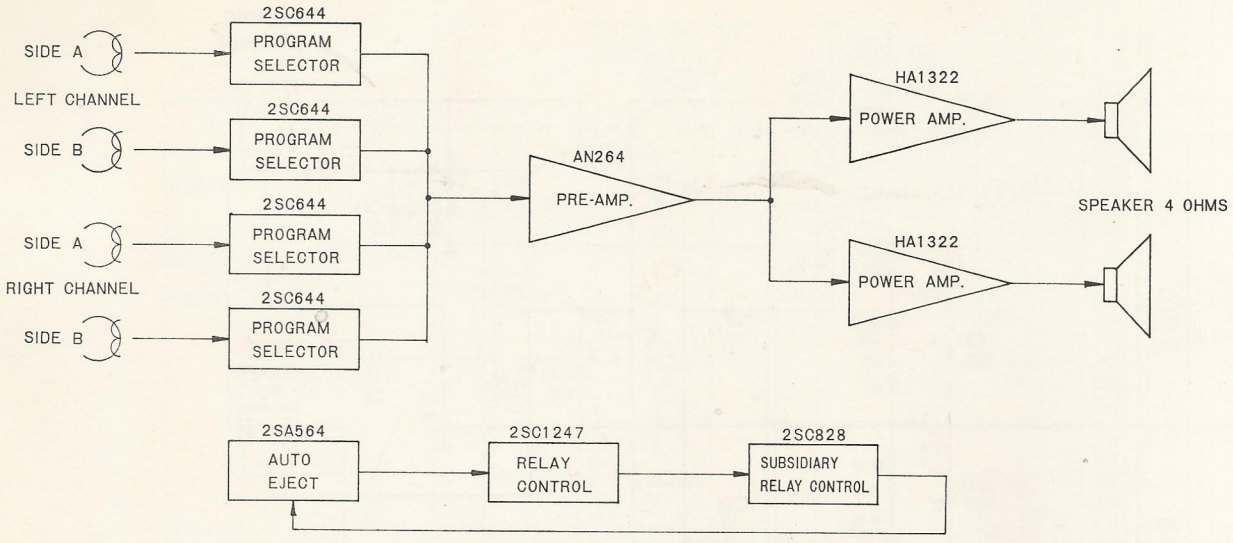

Fig. 1

CHECK POINTS ON PC BOARD

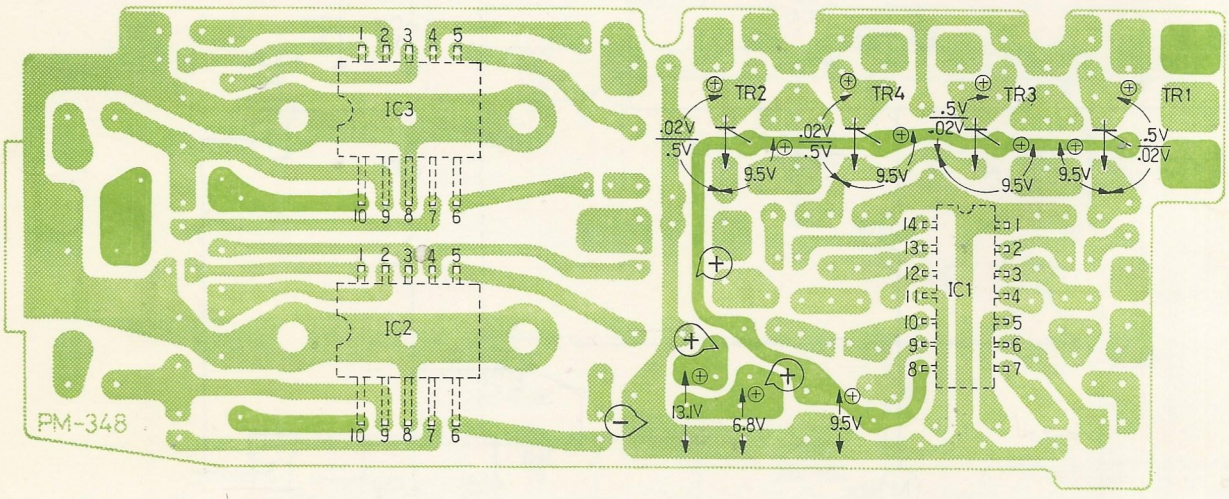

Fig. 2

IC \ Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC 1	—	.32V	.02V	1.6V	.8V	5.6V	7.7V	9.5V	7.7V	5.6V	.8V	1.6V	.02V	.32V
IC 2, IC 3	1.2V	7.9V	1.5V	2.9V	3.8V	3.2V	12.1V	—	6.5V	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 TESTER.

3. IC PIN VOLTAGES MEASURED WITH RESPECT TO CHASSIS.

4. BASE VOLTAGES OF TR_1 TO TR_4 SHOW TWO CONDITIONS, LARGER VALUES AT OPERATING STATE AND SMALLER ONES AT CUT-OFF STATE.

PARTS LOCATION ON PC BOARD

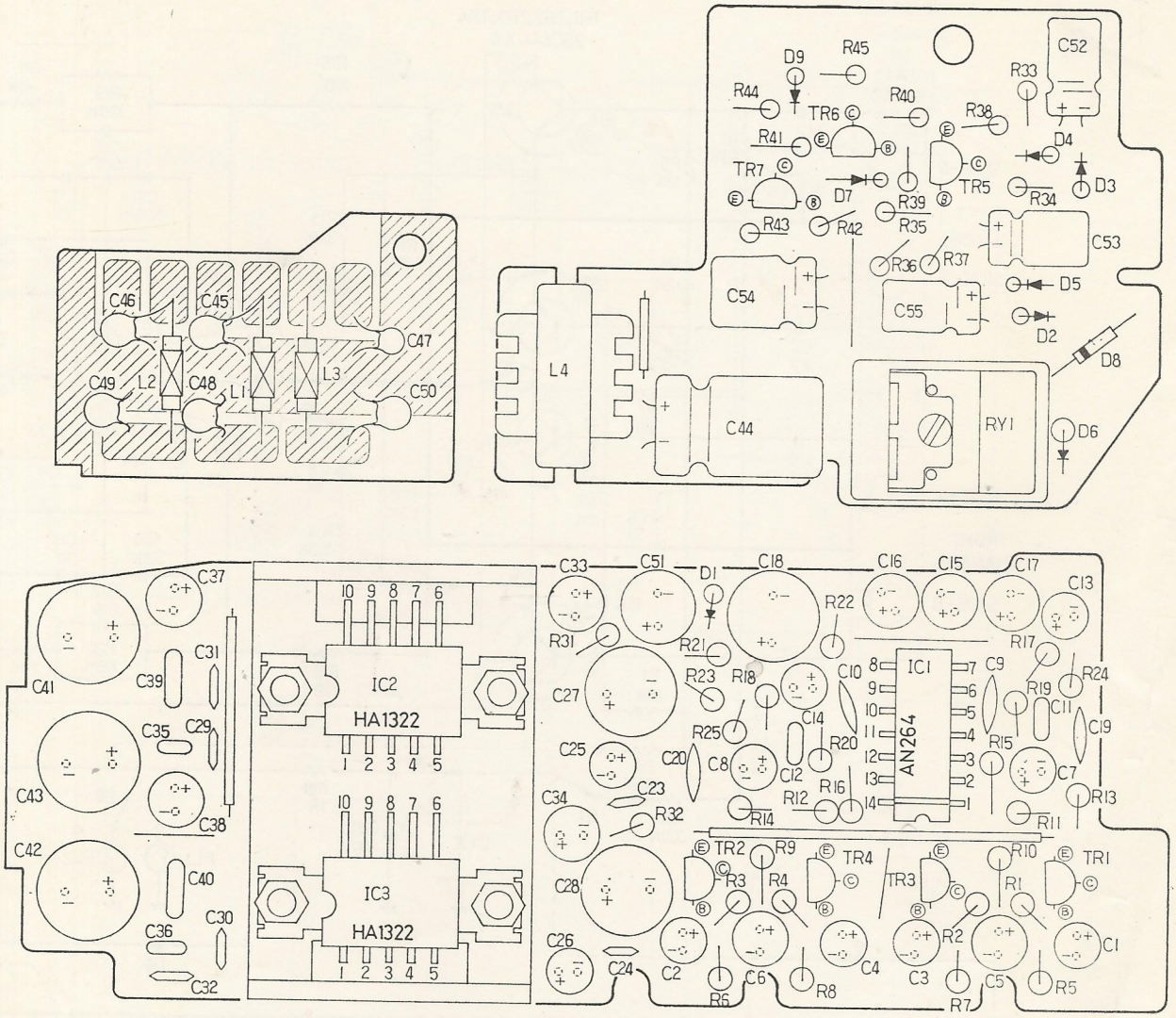

Fig. 3

IC & TRANSISTOR BASING

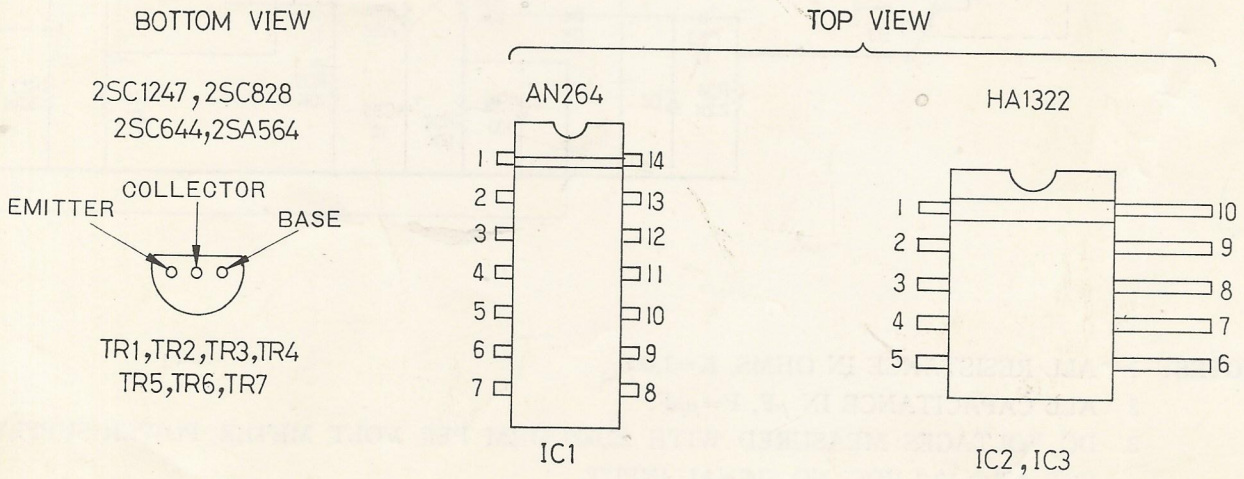

Fig. 4

REPLACEMENT PARTS LIST

Symbol No.	Stock No.	Description			
CAPACITORS					
C_1—C_4	RN-ECE-M4R7V25	4.7 μf		25V	electrolytic
C_5, C_6	RN-ECE-M330V10	33 μf		10V	electrolytic
C_7, C_8	RN-ECE-M1R0V50	1 μf		50V	electrolytic
C_9, C_{10}	RN-ECK-DYW501K	500 pf		50V	ceramic
C_{11}, C_{12}	RN-ECF-R153V50	.015 μf		50V	mylar
C_{13}, C_{14}	RN-ECE-M100V16	10 μf		16V	electrolytic
C_{15}, C_{16}, C_{17}	RN-ECE-M330V10	33 μf		10V	electrolytic
C_{18}	RN-ECE-M221V16-1	220 μf		16V	electrolytic
C_{19}, C_{20}	RN-ECB-DBC104B	.1 μf		12V	ceramic
C_{23}, C_{24}	RN-ECK-DYW222M	.0022 μf		50V	ceramic
C_{25}, C_{26}	RN-ECE-M4R7V25	4.7 μf		25V	electrolytic
C_{27}, C_{28}	RN-ECE-M221V16-1	220 μf		16V	electrolytic
C_{29}, C_{30}	RN-ECC-RSL400K	40 pf		50V	ceramic
C_{31}, C_{32}	RN-ECC-RSL201K	200 pf		50V	ceramic
C_{33}, C_{34}	RN-ECE-M330V10	33 μf		10V	electrolytic
C_{35}, C_{36}	RN-ECF-R472V50	.0047 μf		50V	mylar
C_{37}, C_{38}	RN-ECE-M330V10	33 μf		10V	electrolytic
C_{39}, C_{40}	RN-ECF-R104V50	.1 μf		50V	mylar
C_{41}—C_{44}	RN-ECE-M471V16-1	470 μf		16V	electrolytic
C_{45}, C_{46}, C_{47}	RN-ECK-DYZ202P	.002 μf		50V	ceramic
C_{48}, C_{49}, C_{50}	RN-ECK-DYM103P	.01 μf		50V	ceramic
C_{51}	RN-ECE-M101V10-2	100 μf		10V	electrolytic
C_{52}, C_{53}	RN-ECE-M100V16-L1	10 μf		16V	electrolytic
C_{54}	RN-ECE-M101V10-L1	100 μf		10V	electrolytic
C_{55}	RN-ECE-M100V16-L1	10 μf		16V	electrolytic
RESISTORS & CONTROLS					
R_1—R_4	RN-ERD-DC683J	68k ohm	⅛W	5%	carbon
R_5—R_8	RN-ERD-DC123J	12k ohm	⅛W	5%	carbon
R_9—R_{14}	RN-ERD-DC332J	3.3k ohm	⅛W	5%	carbon
R_{15}, R_{16}	RN-ERD-DC101J	100 ohm	⅛W	5%	carbon
R_{17}, R_{18}	RN-ERD-DC123J	12k ohm	⅛W	5%	carbon
R_{19}, R_{20}	RN-ERD-DC104J	100k ohm	⅛W	5%	carbon
R_{21}	RN-ERD-DC102J	1k ohm	⅛W	5%	carbon
R_{22}	RN-ERD-DC562J	5.6k ohm	⅛W	5%	carbon
R_{23}	RN-FRD-DC102J	1k ohm	⅛W	5%	carbon
R_{24}, R_{25}	RN-ERD-DC562J	5.6k ohm	⅛W	5%	carbon
R_{26}—R_{28}, S_9	RN-ERV-2P3-87	Control, tone 10k ohm, balance 20k ohm			variable resistor
R_{29}, R_{30}	RN-ERV-1N2-126	Control, volume 10k ohm			variable resistor
R_{31}, R_{32}	RN-ERD-DC820J	82 ohm	⅛W	5%	carbon
R_{33}, R_{34}	RN-ERD-DC222J	2.2k ohm	⅛W	5%	carbon
R_{35}	RN-ERD-DC333J	33k ohm	⅛W	5%	carbon
R_{36}	RN-ERD-DC123J	12k ohm	⅛W	5%	carbon
R_{37}	RN-ERD-DC222J	2.2k ohm	⅛W	5%	carbon
R_{38}	RN-ERD-DE102J	1k ohm	¼W	5%	carbon
R_{39}	RN-ERD-DC103J	10k ohm	⅛W	5%	carbon
R_{40}	RN-ERD-DC271J	270 ohm	⅛W	5%	carbon
R_{41}	RN-ERD-DC220J	22 ohm	⅛W	5%	carbon
R_{42}	RN-ERD-DC103J	10k ohm	⅛W	5%	carbon
R_{43}	RN-ERD-DC332J	3.3k ohm	⅛W	5%	carbon
R_{44}	RN-ERD-DC103J	10k ohm	⅛W	5%	carbon
R_{45}	RN-ERD-DC102J	1k ohm	⅛W	5%	carbon

Symbol No.	Stock No.	Description
TRANSISTORS, IC's & DIODES		
TR 1—TR 4	RN-EVS-2SC644-RS	Program selector, silicon
TR 5	RN-EVS-2SA564-PQ	Auto eject, silicon
TR 6	2SC1247A-VS	Relay control, silicon
TR 7	RN-EVS-2SC828-QR	Subsidiary, relay control, silicon
IC 1	RN-EIC-AN264	Pre-amp., linear-monolithic
IC 2, IC 3	RN-EIC-HA1322	Power amp., linear-monolithic
D 1	RN-EDT-MZ207	Regulator, zener
D 2—D 5	RN-EDS-1S1555	Compensator, retangular wave
D 6	RN-EDS-SR1K2	Relay spark suppression, silicon
D 7	RN-EDS-1S1555	Back current suppression, silicon
D 8	RN-EDS-SR1K2	Solenoid spark suppression, silicon
D 9	RN-EDS-1S1555	Back current suppression
MISCELLANEOUS ELECTRICAL		
A 1	RN-EHM-C44-21	Playback head
E 1	RN-EEM-15	Solenoid
F 1	RN-EFG-B05	Fuse, 5 amperes
L 1, L 2, L 3	RN-ELH-BR74	Choke, 0.74 μH
L 4	RN-ELL-206	Choke, filter
M 1	RN-EDM-23	DC motor
P 1	RN-EWS-192	3P connector and lead assy., radio speaker
P 2	RN-EWS-191	3P connector and lead assy., stereo speaker
P 3, P 4	RN-EWP-134	2P connector and lead assy., power supply
PL 1, PL 2	RN-EPL-60-3	Lamp
RY 1, S10	RN-EED-30	DC relay
S 1, S 2, S 3	RN-ESS-42-115	Slide switch, program selector
S 4, S 5, S 6	RN-ESM-105A	Micro switch, Radio/Player changing
S 7, S 8	RN-ESL-153A	Leaf switch, auto reverse
	RN-EWJ-307	Cable, playback head, red
	RN-EWJ-308	Cable, playback head, gray
	RN-EWJ-407	Cable, S_7 and S_8

Illus. No. (Fig. 7)	Stock No.	Description
CHASSIS		
1	RN-MAS-65	Chassis, tape deck
2	RN-MHU-90A	Sub chassis, back cover
	RN-MAD-170	Cover, top
	RN-MAD-163	Cover, bottom
STYLING		
5	RN-MDD-21	Escutcheon
6	RN-MYD-109	Knob, balance control
7	RN-MYN-115	Knob, volume control
8	RN-MYN-116	Knob, tone control and program selector
9	RN-MYB-92	Button, fast forward
10	RN-MYB-93	Button, stop and eject
12	RN-MHG-29A	Cover, for ill. ⑨ and ⑩
13	RN-MHU-91	Supporter, volume control
14	RN-MLC-85A	Supporter, lamp, rubber
15	RN-MLF-48A	Indicator, program
16	RN-MCV-23A	Door, cassette slot
17	RN-MSI-157A	Shaft, for ill. ⑯
18	RN-MSC-152A	Spring, for ill. ⑯
CASSETTE DECK		
25	RN-MYT-13	Slide plate, head and pinchroller mounting
26	RN-MSC-135	Spring, for ill. ㉕
27	RN-MSC-136	Spring, azimuth adjusting
28	RN-MKR-2	Pinchroller assy., right
29	RN-MKR-3	Pinchroller assy., left
33	RN-MSC-137	Spring, for ill. ㉘
34	RN-MSC-138	Spring, for ill. ㉙
35	RN-MUC-13	Cam, fast forward/rewind selector
36	RN-MSC-139	Spring, for ill. ㉟
37	RN-MUL-96	Lever, fast forward
38	RN-MUL-97	Lever, fast forward release
39	RN-MUL-98A	Lever, solenoid
40	RN-MSI-155A	Shaft, for ill. ㊳ and ㊴
41	RN-MSC-140A	Spring, for ill. ㊴
42	RN-MUL-99	Lever, for ill. ㉕
43	RN-MSI-156	Shaft, for ill. ㊷
44	RN-MSC-141	Spring, for ill. ㊷
45	RN-MSP-99	Spring, slip mechanism
47	RN-MUL-100	Lever, left fast forward
48	RN-MUL-101	Lever, right fast forward
49	RN-MSC-142A	Spring, for ill. ㊽
50	RN-MUL-102A	Lever, stop and eject
51	RN-MSC-143	Spring, for ill. ㊿
52	RN-MYT-14A	Sub chassis, slip mechanism and idler mounting
53	RN-MUL-103A	Lever, S_1 — S_3 changing
54	RN-MUL-104	Lever, for ill. ㊸ and ㊺
55	RN-MUL-105	Lever, for ill. ㊹ and ㊻
56	RN-MUL-106	Lever, pinchroller changing
57	RN-MSC-144	Spring, for ill. ㊺ and ㊻

Illus. No. (Fig. 7)	Stock No.	Description
58	RN-MSH-32A	Housing, for ill. 60
59	RN-MRP-117	Roller, for ill. 60
60	RN-MUF-19	Flywheel
61	RN-MUB-21	Belt, drive
62	RN-MRP-128	Pulley, motor
63	RN-MRP-119	Roller, belt
64	RN-MSH-33	Supporter, for ill. 77
65	RN-MUL-107	Lever, left fast forward idler
66	RN-MUL-108	Lever, right fast forward idler
67	RN-MRP-120	Roller, for ill. 65 and 66
68	RN-MSC-145	Spring, for ill. 65 and 66
69	RN-MUL-109	Lever, left fast forward idler
70	RN-MUL-110	Lever, right fast forward idler
71	RN-MRP-121	Roller, for ill. 69 and 70
72	RN-MSC-146	Spring, for ill. 69 and 70
73	RN-MUL-111	Brake, for ill. 77
74	RN-MSC-147	Spring, for ill. 73
75	RN-MHF-62	Supporter, for ill. 116
77	RN-MKS-5	Slip mechanism, assembly of ill. 80 to 89
79	RN-MRP-132	Cap, for ill. 77
80	RN-MRP-122	Roller
81	RN-MST-81	Spacer
82	RN-MSC-35	Spring
83	RN-MRP-138A	Roller, includes contact point of S_7 and S_8
84	RN-MRP-125A	Roller
85	RN-MRP-124	Roller
86	RN-MSE-82	Spacer
87	RN-MSC-148A	Spring
88	RN-MWS-89	Washer
89	RN-MRP-127A	Roller
90	RN-MYT-15A	Sub chassis, cassette loading
91	RN-MUL-112	Fan-shaped lever
92	RN-MSC-164	Spring, for ill. 91
93	RN-MSE-83	Bar, for ill. 91 coupling
94	RN-MUL-113	T-shaped lever, left
95	RN-MUL-114	T-shaped lever, right
96	RN-MUL-115	L-shaped lever, right
97	RN-MUL-118	L-shaped lever, left
98	RN-MSE-84A	Bar, for ill. 94 and 95 coupling
99	RN-MUL-116	Lever, for ill. 94 and 97 coupling
100	RN-MUL-117	Lever, for ill. 95 and 96 coupling
101	RN-MSC-151	Spring, for ill. 99 and 100
102	RN-MHG-27C	Runner, left
103	RN-MHG-28C	Runner, right
104	RN-MRP-126	Roller, for ill. 102 and 103
105	RN-MHF-61A	Supporter, for ill. 102 and 103 mounting
106	RN-MSP-90	Spring, cassette depressing
107	RN-MIP-61A	Insulator, for ill. 116
108	RN-MIP-54B	Insulator, for ill. 115
109	RN-MRU-52	Radiator, IC_2 and IC_3
110	RN-MCO-18	Clamp, P_1, P_2, P_3 and P_4

Illus. No. (Fig. 7)	Stock No.	Description
PRINTED CIRCUIT BOARD		
115	RN-EPP-310-CSP-310	PC board assembly, main
116	RN-EPP-438-CSP-310	PC board assembly, auto reverse
117	RN-MPM-350	PC board, power supply
118	RN-MPM-467	PC board, S_1 — S_3

Illus. No. (Fig. 7)	Stock No.	Description	Q'ty
MISCELLANEOUS PARTS			
126	RN-MCF-6	Clamp, head cord	1
127	RN-MCF-10	Clamp, wiring	1
129	RN-MHL-2×5AL	Rivet, for ill. ⑯ mounting	2
130	F6-ER-4	E type ring, snap (for 4mm shaft)	2
131	F6-ER-3	E type ring, snap (for 3mm shaft)	14
132	F6-ER-2	E type ring, snap (for 2mm shaft)	19
133	F6-ER-1.5	E type ring, snap (for 1.5mm shaft)	13
134	F6-ER-1.2	E type ring, snap (for 1.2mm shaft)	4
135	RN-MWS-87	Washer, 4mm	12
136	F6-WB-3S	Washer, 3mm, spring	5
137	RN-MWP-35	Washer, for ill. ㉘ and ㉙ mounting	3
139	F6-SAKT-2×3	Screw, 2×3mm, for ill. ㊷	1
140	F6-SHT-2×3	Screw, 2×3mm, for ill. ㊾	4
	F6-WB-2.3S	Washer, 2.3mm, spring	2
	F6-WH-2S	Washer, 2mm	1
	F6-SBD-2×4S	Screw, 2×4mm	7
	F6-SBD-2.3×10BS	Screw, 2.3×10mm	2
	F6-SBD-2.3×16BS	Screw, 2.3×16mm	2
	F6-SBD-2.6×4S	Screw, 2.6×4mm	4
	F6-SBD-2.6×3S	Screw, 2.6×3mm	4
	F6-SBD-3×4S	Screw, 3×4mm	20
	F6-SBD-3×5S-M-N1	Screw, 3×5mm	3
	F6-SBD-3×6S	Screw, 3×6mm	9
	F6-SNA-3×4S	Screw, 3×4mm	1
	F6-SNA-3×10BS	Screw, 3×10mm	4
	F6-SSA-2×4S	Screw, 2×4mm	2
	F6-SSA-2.6×4S	Screw, 2.6×4mm	6
	F6-SSA-2.6×5S	Screw, 2.6×5mm	5
	F6-SSA-3×6S	Screw, 3×6mm	2
	F6-WB-3S	Washer, 3mm, spring	4

NOTE: Specifications subject to change without prior notice

SCHEMATIC

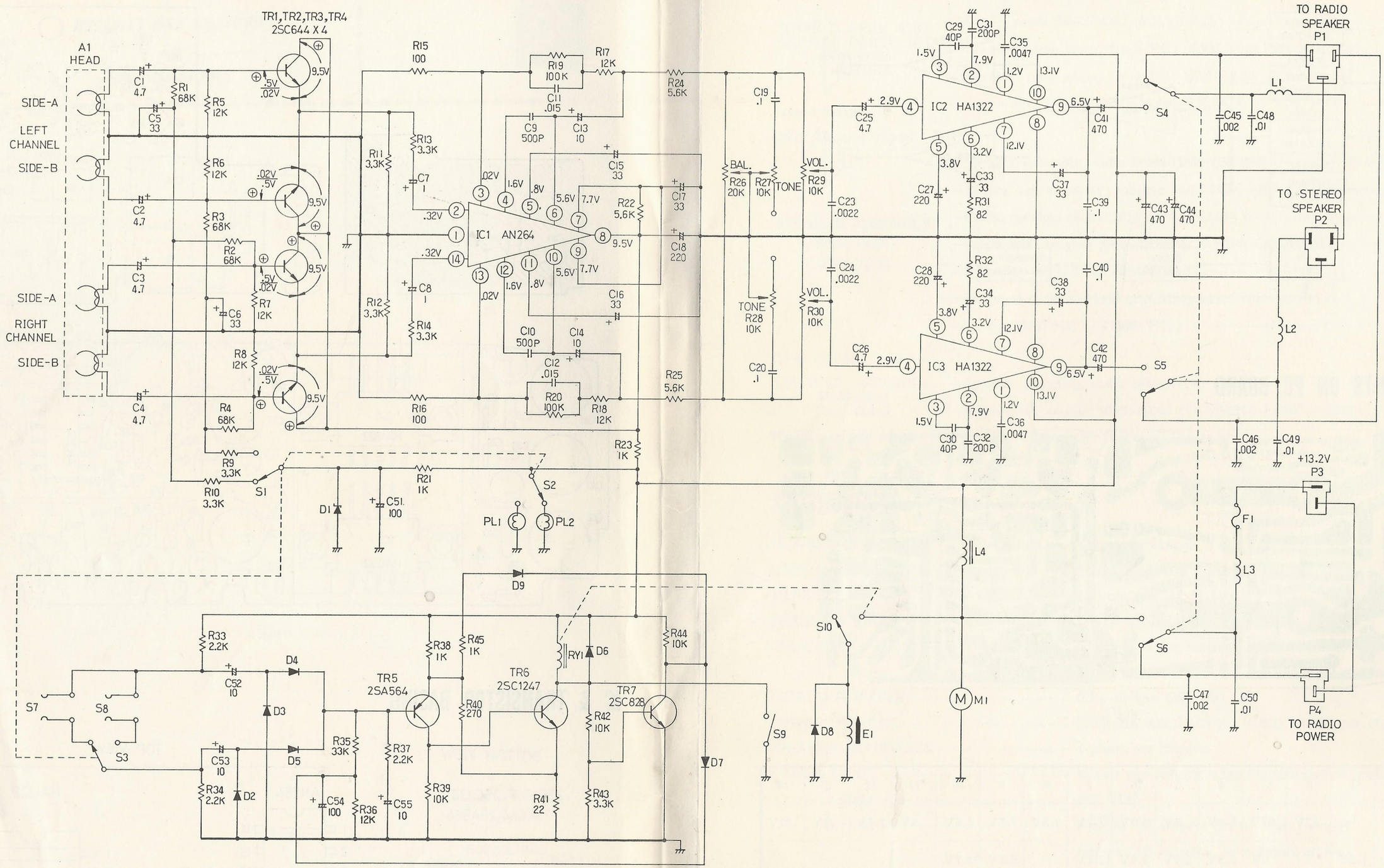

Fig. 5

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. BASE VOLTAGES OF TR_1 TO TR_4 SHOW TWO CONDITIONS, LARGER VALUES AT OPERATING STATE AND SMALLER ONES AT CUT-OFF STATE.

WIRING ON PC BOARD

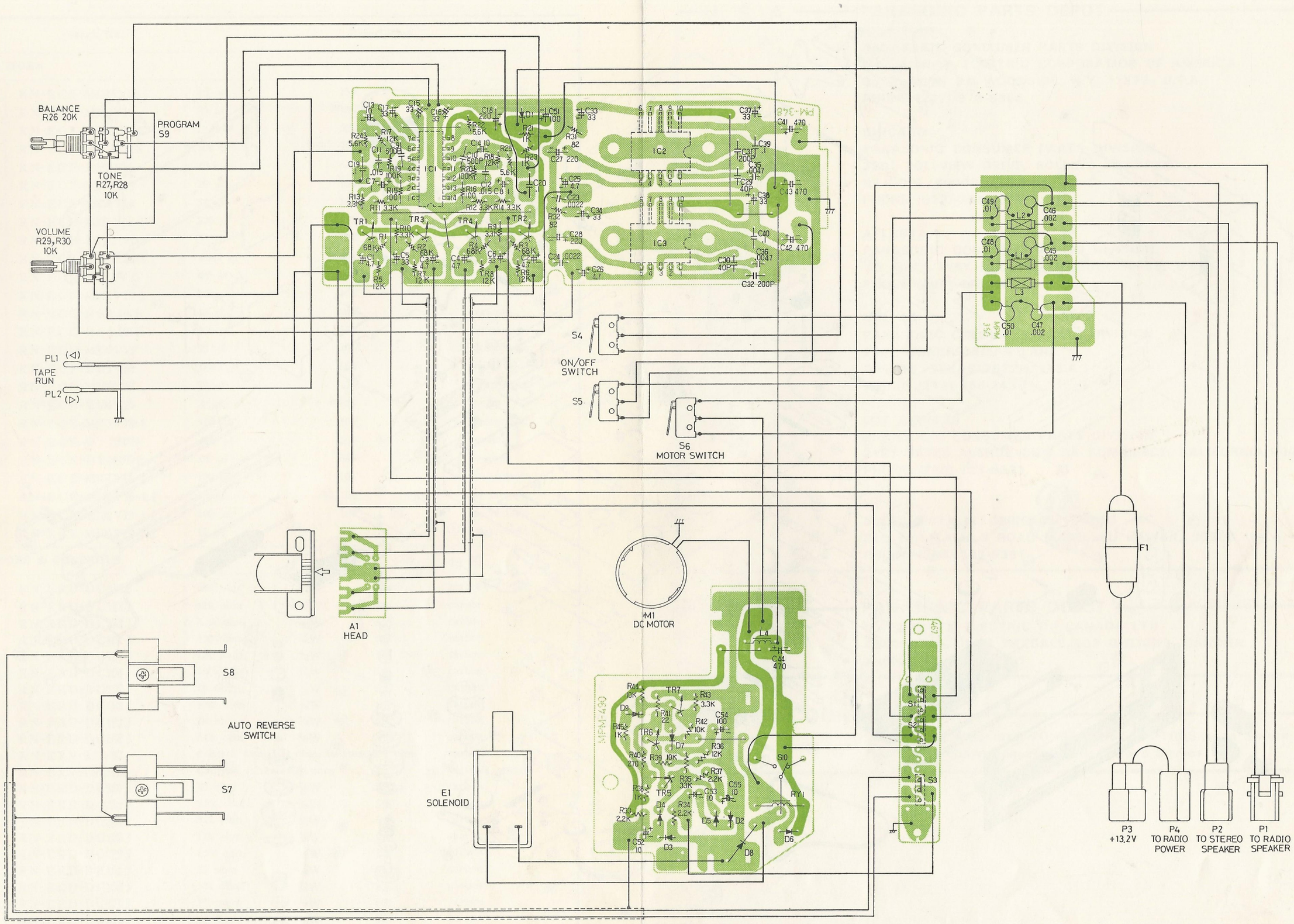

Fig. 6

NOTES: 1. ALL RESISTANCE IN OHMS, K=1,000.
2. ALL CAPACITANCE IN μF, P=$\mu\mu$F.
3. THE SWITCHES S_7 AND S_8 FUNCTION WITH THE CONTACTS INCLUDED IN ROLLERS (RN-MRP-138A).