CLARION SERVICE MANUAL

MINI TYPE IC CASSETTE CAR STEREO AUTO REVERSE SYSTEM

MODEL PE-809A

CLARION SHOJI. CO., LTD.
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370-2814-400
ESCUTCHEON

* SPECIFICATIONS:

Reproducion: ction:	4 track, 2 channel, 2 program stereo cassete tape player (Monaural tape playable)
Tape speed:	1⅞ips (4.75 cm/sec)
Wow and flutter:	Less than 0.44%
S/N ratio:	More than 40dB
Cross talk:	More than 30dB (for adj acent channel) More than 40dB (for adjacent track)
Reproduction frequency range:	50Hz~10,000Hz
Automatic change time:	Less than 8 sec
Power output:	More than 3.0W x 2 (for 8%distortion) More than 3.5W x 2 (for Max volume)
Output impedance:	4Ω x 2
Power supply voltage:	DC. 14V (10.8V~15.6V) Negative ground
Power consumption:	Less than 1.5A (at Max output) Less than 4.5A (at plunger operated)
Semiconductors:	4 Ics, 4 transistors and 2 diodes Amplifiers·····TA7063P x 2 (IC) TA7092P x 2 (IC) Auto changer····· 2SC373 x 1 2SC735 x 1 2SD235 x 1 2SH21 x 1 1N60 x 1 (Diode) 10D4 x 1(Diode)
Weight:	3.74 lbs (1.7kg)
Dimensions:	Width 5.5" (140mm) Height 2.16" (55mm) Depth 5.9" (150mm)

* COMPONENTS

PA-8092-04	Main unit	1 Set
280-3020-00	Owner's guide	1 Each
300-0490-00	Rear mounting bracket	1 Each
300-5074-00	Mounting bracket	1 Each
852-1090-02	Extension lead	1 Each
921-5701-00	Parts bag	1 Set
950-4627-00	Packaging kit	1 Set

*FEATURES

- Automatic reversing specially develped and developed and designed for exclusive use in car stereos.
- 4-track system allows the listening of two programs of stereo music from one cassette and provides monotrack playback.
- By employing 4-monothelic ICs, beartiful Hi-Fi sound is reproduced. Reliability and compact construction are utilized.
  An automatic program switching device makes it possible to automatically switch the program when the tape ends, allowing instant playback.
  The program can be switched midway through the tape by pressing the program button.
- With the incorporation as a program indicator, the program direction can be confirmed at a glance.
- A specially designed mechanism provides stable playback even while driving over tough terrain regarless of vibration resistance.

Printed

* OPERATIONAL PROCAUTIONS

- Since ICs are used in the amplifier section, care should be taken to make contact with the ground or other terminals.
- When a fuse is blown, always use the specified 5 A fuse. Other than specified fuses will damage the ICs.
- Remove the lock screws on the reverse side of the main unit prior to mounting. Also, di not insert the cassette without the removal of the lock screw.

1. ICs

A. Pre amplifier IC (IC1 · IC51) ····· TA7063P

- The IC in the preamplifier is equivalent to a circuit containing 3 transistors and 5 resistors as shown in Fig 1. It is very convenient when repairing to refer to a circuit equivalent to Fig. 1.
- The transistor used in the first stage is particularly low noise and allowing amplification with high S/N and features iow output impedance.

B. Power amplifier IC (IC2, IC52) ····· TA7092P

The power amplifier IC is equivalent to that in Fig. 2, which obtains again of 50dB.

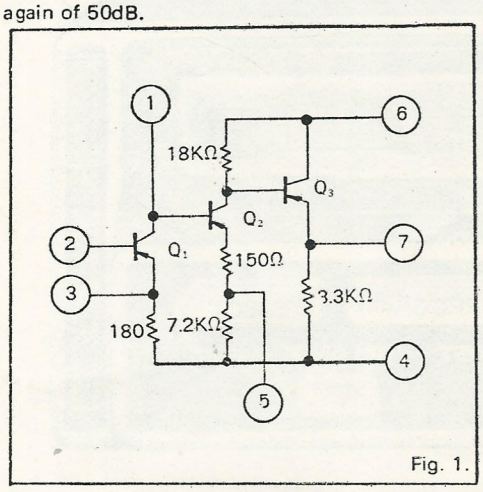


Fig. 1.

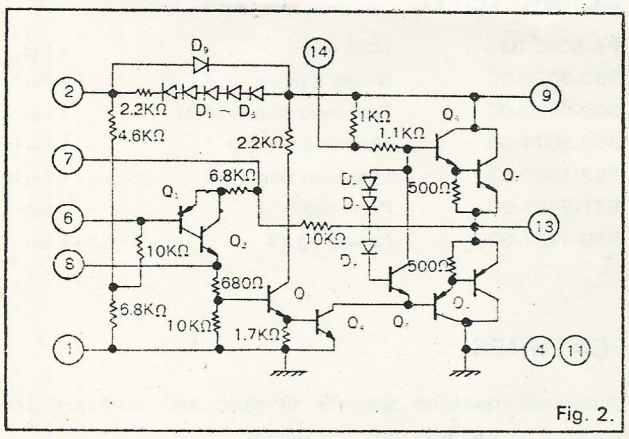


Fig. 2.

C. Precautions for ICs

- Since the clearance between the IC's terminals are very slight, do not touch a tester rod to the other terminal when measuring the terminal voltage.
- While checking ICs, an abnormal oscillation may occur inside the IC's due to induction by stray capacity. Therefore, be careful not to use exceptionally long lead wire and minimize the input capacity of the measurement devices.
- The use of a soldering iron with high capacity is not recommended, when replacing ICs.
- ICs can not withstand the voltage, current a power greater than specified. Never apply excessive voltage to the LC terminal or apply the input by short circuiting the speaker output.

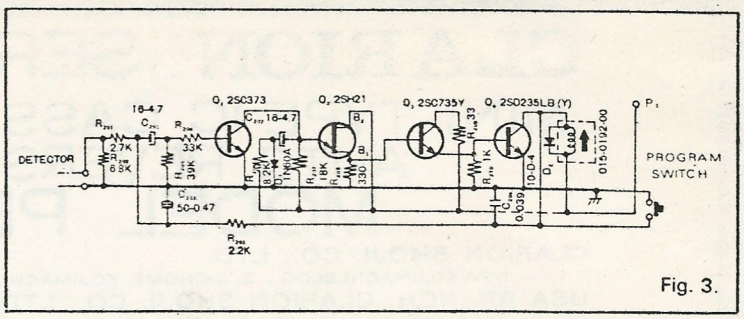


Fig. 3.

2. Operation explanation of the automatic program switching circuit

The operation of Q2 is descrived as follows. An equivalent circuit to Q2 in Fig 4, is formed with one diode and two resistors and its electrical characteristics are given in Fig 5.

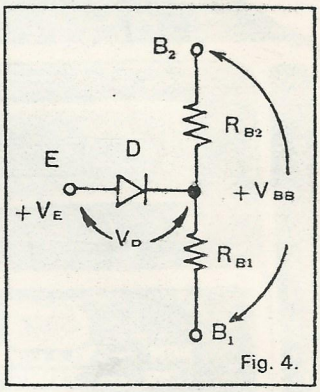


Fig. 4.

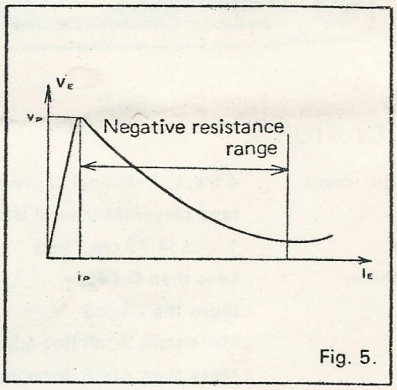


Fig. 5.

When the voltage of VBB is applied between B2 and B1, the peak point voltage Vp is obtained from Fig. 4 as follows:

$$Vp = VD + \frac{RB1}{RB1 + RB2} VBB$$

When VE<Vp is formed, where the VE is the voltage to be applied externally to point E, the area between E and B1 are cut off by D. When VE>VP are formed, the area becomes the negative resistance range and the area between E and B1 conducts.

Circuit description of Fig. 4.

The detector repeats the operation of ON and OFF while the tape is taken up and the reel base rotates. The voltage waveform across the R202 is transmitted as rectangular waveform signals. Then differentiated signal makes Q1 conduct and discharges the charge to be charged into the C202. Thus, the relationship of VE<Vp is formed, Q3 and Q4 are out off the plunger does not attract.

When the tape ends and the reel base stops, the signal from the detector becomes nil, Q1 cuts off the C202 is charged through R207 and D1. When the terminal voltage of E in Q2 reaches Vp in Fig. 5, the Q2 conducts. The voltage is produced across the R208, which saturates Q3 and Q4, and the plunger in attracted in T1 seconds after the detector is stopped.

(When the program is not switched within T2 seconds of the attracting time and the detector stops, the operatsion of T1 – T2 – T1 – T2 is repeated.) T1 is 2 ~ 8 seconds and T2 is 0.15 ~ 0.5 second.

* ADJUSTMENT OF LEFT-RIGHT AMPLIFIER OUTPUT (Refer to Fig. 6)

When a volume difference between the left and right channel amplifiers exists of when the volume difference is noticable at the switching time of the program adjust the semi-fixed resistor for gain control with an insulated screw driver.

Note: For adjustment, always prepare for the following
VOLUME CONTROL ····· MAX
TONE CONTROL ····· HIGH
BALANCE CONTROL ····· CENTER

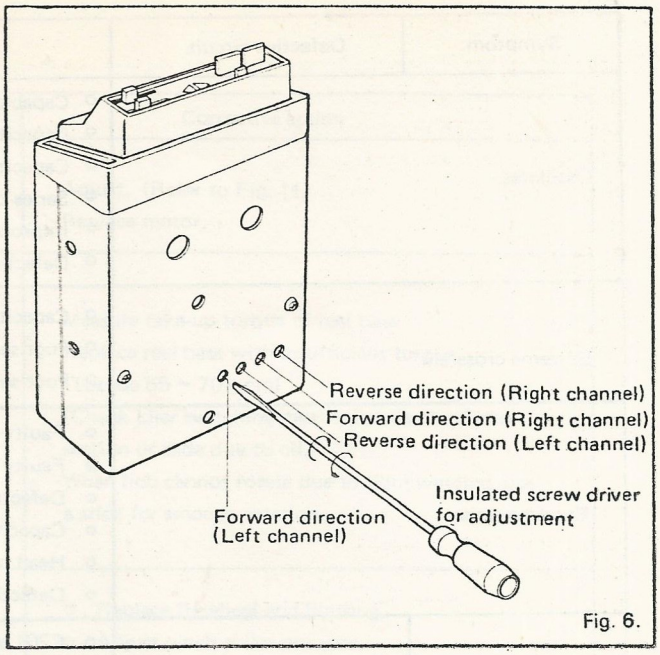


Fig. 6.

*TROUBLESHOOTING MANUAL FOR ELECTRICAL SYSTEM (Refer to circuit diagram and wiring diagram)

Symptom	Defective circuit	Defective point and cause	Corrective action
No sound	Power supply circuit	○ Blown fuse	Replace.
		○ Poor contact of the power supply cord.	Repair or replace.
		○ Filter chock (010-0820-05) open.	Replace.
		○ Choke coil (009-0592-00) open.	Replace.
		○ Defective CT-3 or poor soldering	Replace or solder.
		○ Defective SW2 or defective contact	Replace or adjust.
		○ R102 open.	Replace.
		○ C102 short circuited.	Replace.
		○ R101 open.	Replace.
		○ C101 short circuit.	Replace.
	Output circuit	○ Speaker voice coil open.	Replace.
		○ Defective CT-1, CT-2 or poor soldering.	Replace or repair.
		○ Series coil (010-1657-00) open.	Replace.
		○ Capacity drop in C13 or C63.	Replace.
		○ C11 or C61 short circuited.	Replace.
		○ Defective IC 2 or IC 52.	Replace.
		○ C10 or C60 short circuited.	Replace.
	Preamplifier circuit	○ C4 or C54 short circuited	Replace.
		○ C3 or C53 short circuited	Replace.
		○ C2 or C52 short circuited	Replace.
		○ R1 or R51 open or short circuited.	Replace.
		○ Defective IC 1 or IC 51.	Replace.
		○ Head open.	Replace.
		○ Faulty contact in SW2.	Adjust or replace.
Low sound	Power supply circuit	○ Resistance increase in R102	Replace.
		○ Poor insulation in C102	Replace.
		○ Resistance increase in R101	Replace.
		○ Poor insulation in C101	Adjust or replace
	Output circuit	○ C9 or C59 short circuited.	Replace.
		○ Capacity drop or short circuit in C8 or C58	Replace.
		○ Resistance increase in R5 or R55.	Replace.
Sound distortion	Preamplifier circuit	○ Capacity drop in C4 or C54	Replace.
	Output circuit	○ C12 or C62 short circuited.	Replace.
		○ Defective IC 2 or IC 52.	Replace.

Symptom	Defective circuit	Defective point and cause	Corrective action
Oscillates.		o Capacity drop in C11 or C61. o Capacity drop in C10 or C60. o Capacity drop in C3 or C53. o Series coil (010-1657-00) short circuited. o Improper securing of IC2 or IC52 mounting screw. o Defective IC 2 or IC 52.	Replace Replace. Replace. Replace. Tighten. Replace.
Extreme crosstalk		o Capacity drop in C9 or C59. o Poor securing of IC 2 or IC 52 mounting o Poor securing of grounding.	Replace. Tighten. Tighten.
Extreme noise.		o Faulty soldering in C8 or C58. o Faulty soldering in C2 or C52. o Defective IC. o Capacity drop in C202. o Head magnetized. o Defective motor.	Solder. Solder. Replace. Replace. Demagnetize. Replace.
Failure of the automatic program switching device	Automatic program switching circuit	o C201 short circuited. o Conduction between C and E of Q10. o R207 open. o R209 open. o Q2, Q3, or Q9 open.	Replace. Replace. Replace. Replace. Replace.
Malfunction of automatic program switching device	Automatic program switching circuit	o Faulty contact of detector o R201 open. o R203 open. o R204 open. o R205 open. o C203 short circuited.	Adjust or replace. Replace. Replace. Replace. Replace. Replace.
Plunger does not return.	Automatic program switching circuit	o R206 open. o D1 open. o R202 open. o Conduction of Q2, Q3 or Q4.	Replace. Replace. Replace. Replace.
Short timing automatic program switching	Automatic program switching circuit	o Faulty contact in detector o Increased resistance R201, R203, R204 or R205 o Capacity drpp in C201 or C202. o C203 deteriorated o Q1 or Q2 deteriorated.	Adjust or replace. Replace. Replace. Replace.
Delayed time of automatic program switching	Automatic program switching circuit	o C202 deferiorated o Increased resistance C207 o Q1 or Q 2 deteriorated.	Replace. Replace. Replace.
Motor failure		o Chock transformer (009-0470-00) open o C205 short circuited. o Defective CT-4. o Defective motor.	Replace. Replace. Replace. Replace.

* Troubleshooting manual for mechanical system

Symptom	Defective point and cause	Corrective action
No sound	Tape does not run. (Cause) o Power supply failute. o Motor failure.	Adjust. (Refer to Fig. 11) Replace motor.
Tape is not taken up.	Malfunction of tape take-up mechanism. (Cause) o Defective reel base o Malfunction of the idler o Hub rotation failure due to warped or tight winding of cassette cartridge.	Measure take-up torque of reel base. Replace reel base with insufficient torque. (Torque 55 ~ 70 g.cm) (Check idler switching mechanism catch of idler section or slide due to oil.) When hub cannot rotate due to tight winding, use a stick for smooth rotation.
Extreme wow	o Seizure of capastan and bearing o Faulty pressure in the Pinch roller o Dirty pinch roller o Dirty belt o Defective take-up mechanism o Defective motor	o Replace flywheel and housing. o Adjust pinch roller pressure. o Clean or replace. o Clean or replace. o Replace. o Replace.
Automatic program switching is occurs durring playback.	o Faulty contact of the automatic switching detecting terminal.	o Ensure terminal contact to an extent that the wow becomes extreme. Lift terminal. o Replace.

*ADJUSTMENT OF UNIT

* Rotation drive mechanism (Refer to Fig. 7)

Rotation directions of each rotation drive part is given in Fig. 7. illustrates the rotation directions for the forward playback.

For the reverse palyback, the idler and reel base rotate in the contact state.

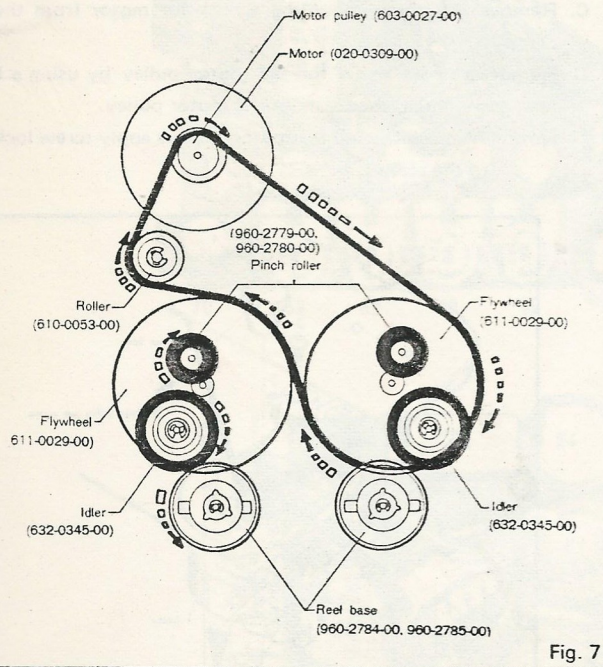


Fig. 7.

* Adjustment of the head azimuth (Refer to Fig. 8)

The aximuth can be adjusted by playing a test tape of 6.3 kHz-10VU, rotating clockwise or counterclockwise and by altering the inclination angle of the head.

At this time, switch the program and adjust to obtain the minimal azimuth difference between the forward and reverse direction. After adjustment, tighten the adjusting screw by using screw lock paint.

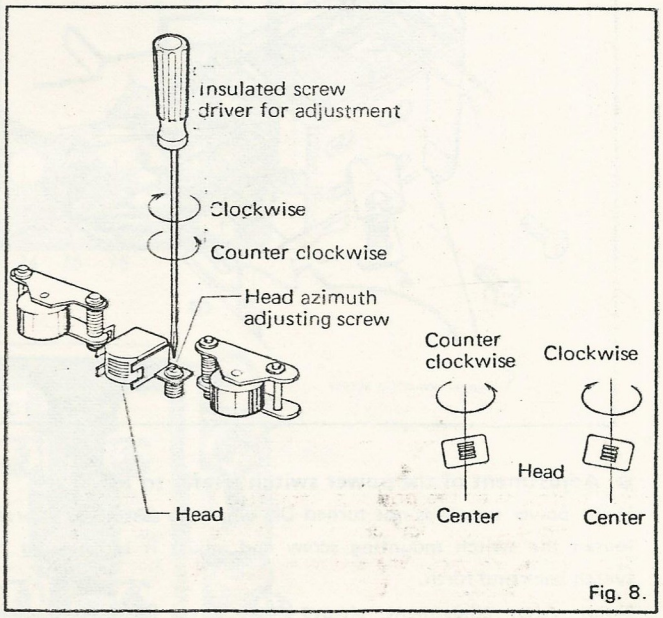


Fig. 8.

* Adjustment of pinch roller pressure (Refer to Fig. 9)

Press the center of the pinch roller mounting piece with the tension gauge in the play state and measure the pressure at the moment when the pinch roller parts from the capstan.

The normal pressure is 300g ~ 400g.

If the pressure is not within the tolerance range, replace the pinch roller pressure spring.

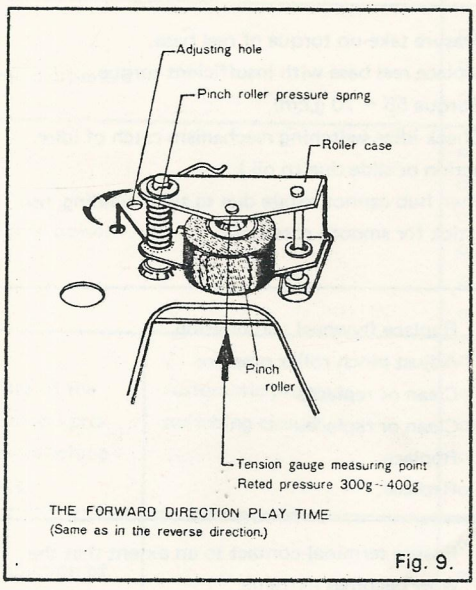


Fig. 9.

* Mounting position adjustment of plunger (Refer to Fig. 10)

When the program switching operation malfunctions due to the improper mounting position of plunger, loosen the two mounting screws move the plunger back and forth and adjust the mounting while ensuring switching operations of both forward and recerse.

Note: After adjustment, always apply screw lock paint to the screws.

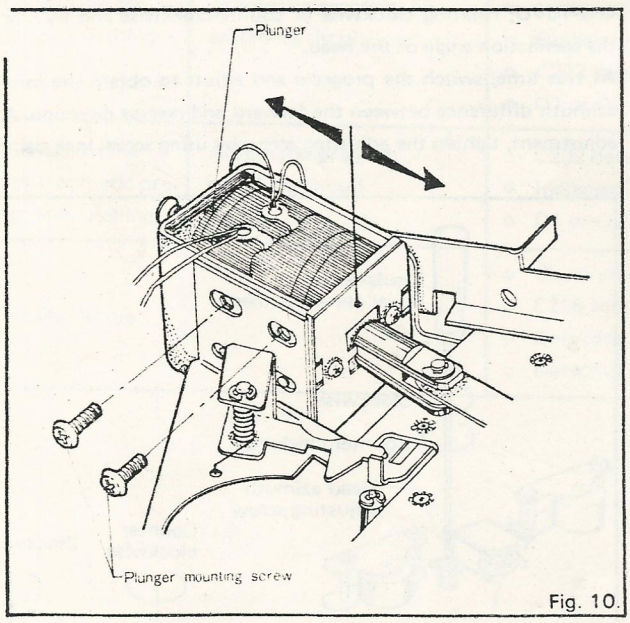


Fig. 10.

* Adjustment of the power switch (Refer to Fig. 11)

If the power supply is not turned ON when the cassette is inserted, loosen the switch mounting screw and adjust it by shifting the switch back and forth.

Note: After adjustment, always apply screw lock paint to the screws.

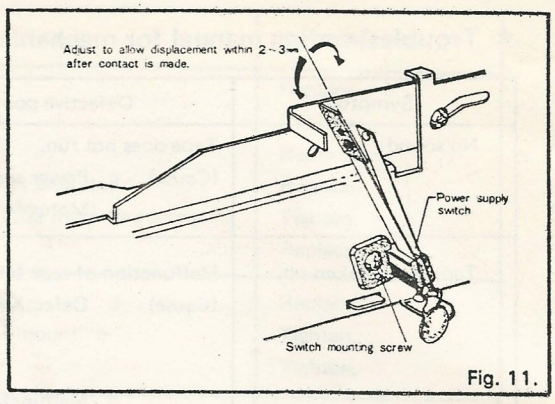


Fig. 11.

* Adjustment of the head selector switch (Refer to Fig. 12)

When it is determined that the channel sound was lost due to a defective head selector switch at the time of the directional inversion, loosen the mounting screw for the printed circuit board on which the head selector switch is mounted. Move the head selector left and right together with the printed circuit board to adjust the head selector switch operation.

Note: After adjustment, always apply screw lock paint to the screw.

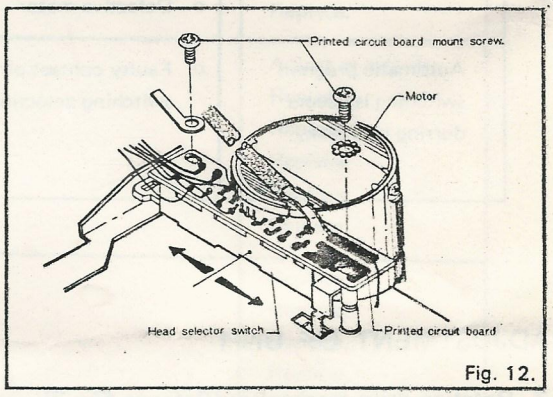


Fig. 12.

* Replacement of motor (Refer to Fig. 13)

Replace the defective motor as follows.

A. Remove the filter assembly (944-0397-00)
B. Disconnect the lead wire of motor power supply from the filter assembly by using a soldering iron.
C. Remove the three mounting screws for motor from the d plate.
D. Remove the set screw for the motor pulley by using a L type hexagon wrench, then remove the motor pulley.

Note: After replaceing the motor, always apply screw lock paint to the screws.

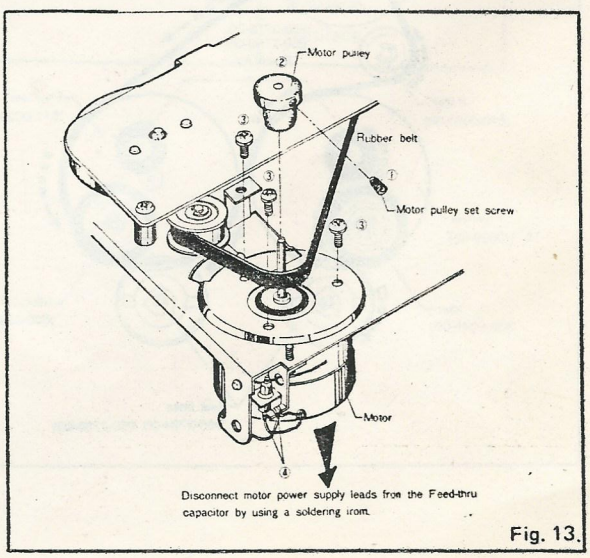
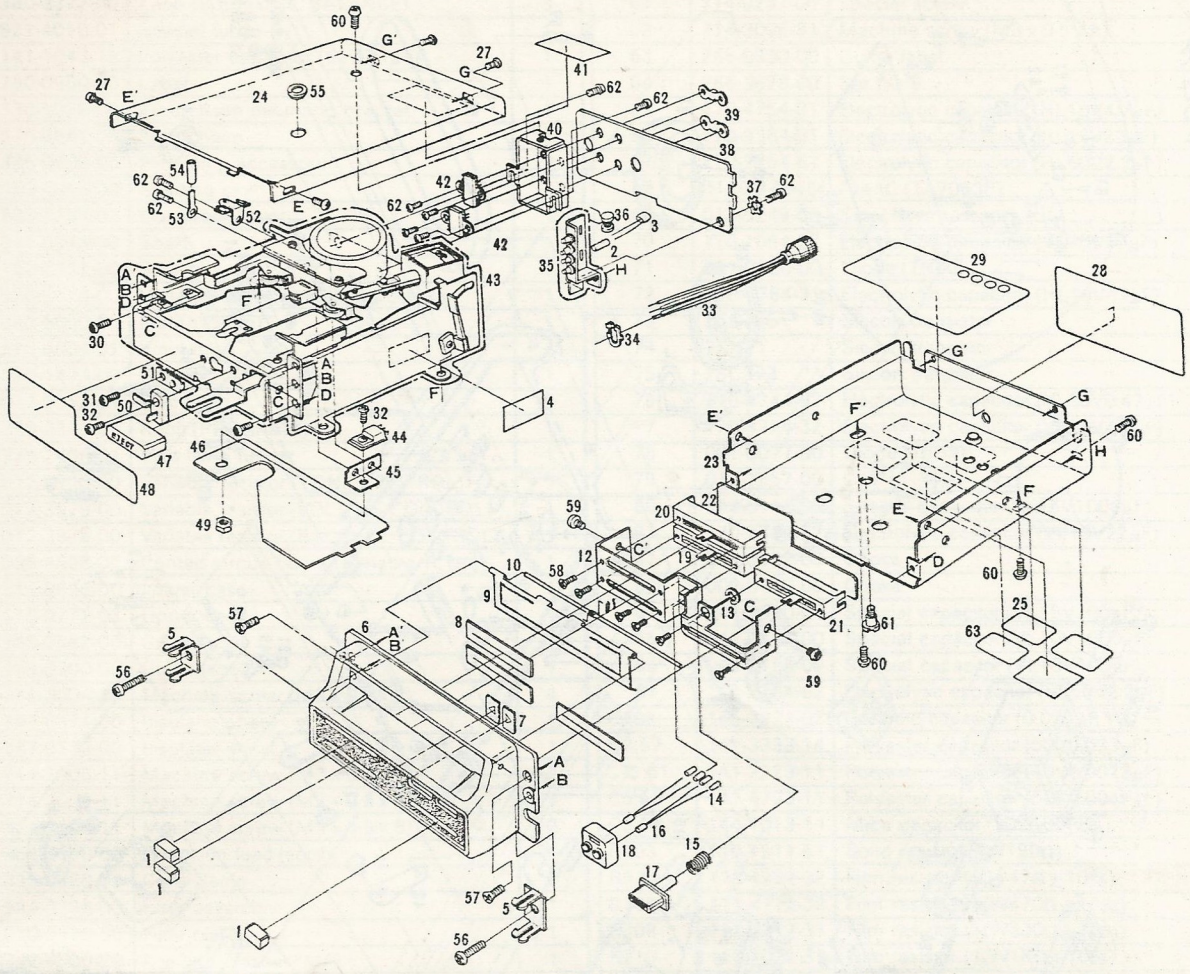


Fig. 13.

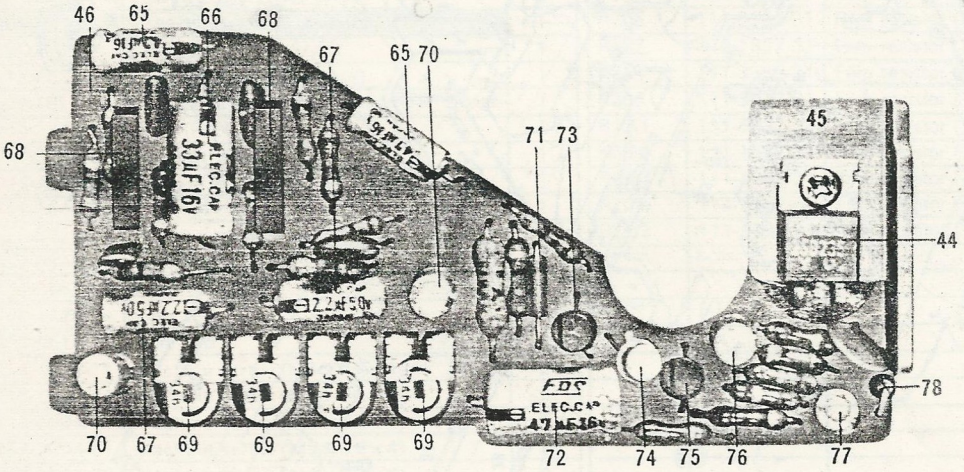
*EXPLODED VIEW: Refer to the parts list.

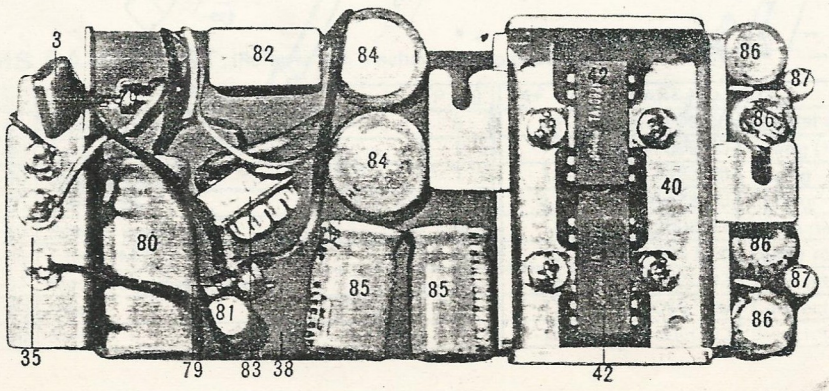
⊙Main body section



*EXPLODED VIEW: The dot lined portion in the diagram is the assembly.

⊙Mechanism section





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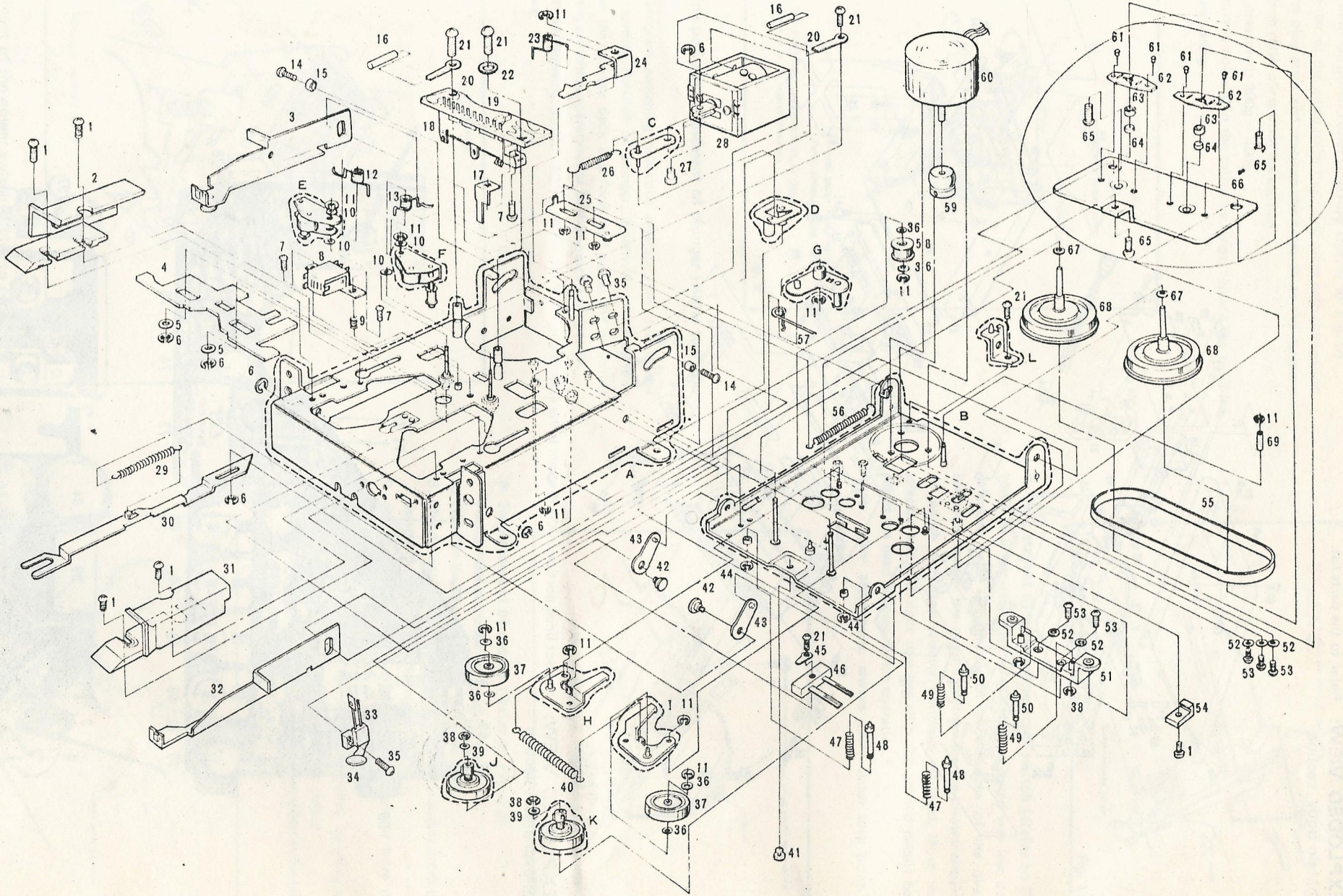


* PARTS LIST: (Refer to disassembly diagram: Grey portions in the parts list designate assemblies)

REF. NO.	PART NO.	DESCRIPTION	P.C.S
1	380-3372-00	Knob (VOL. TONE. BALANCE)	3
2	821-4010-01	Special tube	1
3	141-1043-15	Polyester capacitor (50V0.1μF)	1
4	290-0900-00	Label	1
5	330-5029-00	Escutcheon mounting bracket	2
6	370-2843-00	Escutcheon	1
7	375-0508-00	Pilot lamp accessory	2
8	353-0018-00	Shading cloth	3
9	320-0183-03	Dustproof cover	1
10	341-0948-00	Shaft	1
11	750-0951-00	Spring	1
12	330-5028-00	Variable resistor mounting bracket	1
13	743-5000-00	E-Ring (5mm)	1
14	820-4004-01	Vinyl tube	4
15	750-1473-00	Spring	1
16	017-0313-01	Pilot lamp	2
17	380-3373-01	Knob (PROGRAM)	1
18	345-2406-01	Pilot lamp holder	1
19	012-3330-00	Variable resistor (TONE CONTROL)	1
20	012-3329-00	Variable resistor (VOLUME CONTROL)	1
21	012-3328-00	Variable resistor (BALANCE CONTROL)	1
22	099-4098-02	Printed circuit board (Variable. R. use)	1
23	311-0826-00	Lower case	1
24	310-0772-02	Upper case	1
25	285-0582-00	Guide label	1
26	285-0300-00	Guide label	1
27	714-3004-89	Machine screw (M3 x 0.5 x 4)	4
28	347-0374-00	Insulater sheet	1
29	347-0373-00	Insulater sheet	1
30	714-3006-11	Machine screw (M3 x 0.5 x 6)	2
31	714-3004-11	Machine screw (M3 x 0.5 x 4)	1
32	714-3008-11	Machine screw (M3 x 0.5 x 8)	2
33	852-3160-00	Extension lead (cord)	1
34	335-0580-00	Cord clamp	1
35	944-0396-00	Filter assembly	1
36	010-0820-00	Filter coil	1
37	742-4000-20	Toothed washer (M4)	1
38	099-4096-00	Printed circuit board (Main amp circuit)	1
39	330-4960-01	Power IC attaching plate	2
40	313-0834-00	Heat sink (Power IC use)	1
41	347-0392-00	Insulater sheet	1
42	051-0010-00~05	Power IC (TA7092P)	2
43	930-0413-00	Tape mechanism assembly	1
44	2SD235	Transistor	1
45	313-0835-00	Heat sink (Transistor use)	1
46	099-4097-00	Printed circuit board (Pre amp and program change)	1
47	380-3374-00	Knob (EJECT)	1
48	347-0372-00	Insulater sheet	1
49	723-3000-32	Hex nut (M3 x 0.5)	1
50	335-0640-00	Program change switch plate	1
51	330-5030-00	Program change switch plate	1
52	073-0445-00	Terminal	1
53	330-4662-00	Lead clamp	1
54	820-4020-04	Vinyl tube	1
55	335-0618-00	Hole cap	1
56	714-4012-11	Machine screw (M4 x 0.7 x 12)	2
57	714-3008-41	Machine screw (M3 x 0.5 x 8)	2
58	714-2004-41	Machine screw (M2 x 0.4 x 4)	6
59	714-3004-81	Machine screw (M3 x 0.5 x 4)	2
60	714-3006-89	Machine screw (M3 x 0.5 x 6)	4

REF. NO.	PART NO.	DESCRIPTION	P.C.S
61	714-0231-00	Special screw	1
62	714-3006-81	Machine screw (M3 x 0.5 x 6)	9
63	285-0330-00	Guide label	1
64	286-3678-00	Set plate	1
65	170-4754-31	Electrolytic capacitor (HL16V4.7μF)	2
66	170-3364-31	Electrolytic capacitor (HL16V33μF)	1
67	170-2254-61	Electrolytic capacitor (HL50V2.2μF)	2
68	051-0011-00~04	Pre IC (TA7063P)	2
69	012-3249-00	Semi-fixed resistor	4
70	170-1064-22	Electrolytic capacitor (VL10V10μF)	2
71	001-0020-00	Diode (1N60)	1
72	170-4764-31	Electrolytic capacitor (HL16V47μF)	1
73	2SC735	Silicon transistor	1
74	2SH21	Silicon transistor	1
75	2SC373	Silicon transistor	1
76	170-4744-62	Electrolytic capacitor (VL50V0.47μF)	1
77	170-4754-32	Electrolytic capacitor (VL16V4.7μF)	1
78	001-0077-00	Diode (10D4)	1
79	010-1657-00	Coil	2
80	042-0144-00	Special capacitor (VL16V1000μF)	1
81	170-2264-22	Electrolytic capacitor (VL10V22μF)	2
82	009-0592-00	Choke	1
83	009-0470-00	Choke	1
84	042-0070-00	Special capacitor (VL15V300μF)	2
85	042-0153-00	Special capacitor (VL10V1000μF)	2
86	042-0158-00	Special capacitor (VL10V100μF)	4
87	170-2254-62	Electrolytic capacitor (VL50V2.2μF)	2
C104	165-3934-02	Ceramic capacitor (0.039μF YG)	1
C7.57	141-3333-14	Polyester capacitor (50V0.033μF)	3
C11.61	141-2223-11	Polyester capacitor (50V0.0022μF)	2
C5.55	141-4723-11	Polyester capacitor (50V0.0047μF)	2
C3.53	144-1013-14	Mica capacitor (50V100PF)	2
R103	110-1511-51	Solid resistor (1W150Ω)	1
R5.55	111-4702-32	Film resistor (¼W47Ω±10%)	2
R102	111-4712-32	Film resistor (¼W470Ω±10%)	1
R208	111-3312-31	Film resistor (¼W330Ω±10%)	1
R210	111-1022-31	Film resistor (¼W1KΩ±10%)	1
R203	111-2222-31	Film resistor (¼W1KΩ±10%)	1
R201	111-2722-31	Film resistor (¼W2.7KΩ±10%)	1
R101	111-4722-31	Film resistor (¼W4.7KΩ±10%)	1
R4.54	111-5622-31	Film resistor (¼W5.6KΩ±10%)	2
R202	111-6822-31	Film resistor (¼W6.8KΩ±10%)	1
R206	111-8222-31	Film resistor (¼W8.2KΩ±10%)	1
R207	111-1832-31	Film resistor (¼W18KΩ±10%)	1
R204	111-3332-31	Film resistor (¼W33KΩ±10%)	1
R205	111-3932-31	Film resistor (¼W39K Ω±10%)	1
R1.51	111-6832-31	Film resistor (¼W68KΩ±10%)	2
R6.56	111-1532-31	Film resistor (¼W15KΩ±10%)	2
R3.53	111-1052-31	Film resistor (¼W1MΩ±10%)	2
R209	114-3302-51	Film resistor (1W33Ω±10%)	1
R2.52	111-2732-31	Film resistor (¼W27KΩ±10%)	2

* MECHANISMS PARTS LIST: (Refer to the mechanism exploded view)

REF. NO.	PART NO.	DESCRIPTION	P.C.S
1	714-2604-81	Machine screw (M2.6 x 4)	5
2	606-0047-00	Pack guide (Left)	1
3	630-0592-00	Guide plate-A	1
4	630-0596-00	Slide plate	1
5	746-0629-00	Special washer	2
6	743-3000-00	E-Ring (M3)	6
7	714-2006-81	Machine screw (M2 x 6)	3
8	011-0219-00	Head	1
9	755-1461-00	Spring	1

REF. NO.	PART NO.	DESCRIPTION	P.C.S
10	746-0609-00	Special washer	4
11	743-2000-00	E-Ring (M2)	13
12	750-1462-00	Spring	1
13	750-1478-00	Spring	1
14	714-3008-81	Machine screw (M3 x 8)	2
15	632-0343-00	Guide roller	2
16	820-4020-02	Vinyl tube	2
17	630-0591-00	Connect plate	1
18	013-3066-00	Switch	1

REF. NO.	PART NO	DESCRIPTION	P.C.S
19	099-4099-00	Printed circuit board (Head select use)	1
20	330-4896-00	Lead clamp	2
21	714-2606-81	Machine screw	5
22	742-3000-20	Toothed washer (M3)	1
23	750-1472-00	Spring	1
24	630-0608-00	Lock plate	1
25	630-0594-00	Ejector plate	1
26	750-1460-00	Spring	1
27	632-0269-01	Plunger pin	1
28	015-0192-00	Plunger	1
29	750-1464-00	Spring	1
30	630-0595-00	Eject lever	1
31	606-0046-00	Pack guide (Right)	1
32	630-0593-00	Guide plate-B	1
33	013-3103-00	Switch	1
34	165-3934-02	Ceramic capacitor (0.039μF YG)	1
35	714-3005-81	Machine screw (M3 x 5)	3
36	746-0625-00	Special washer	6
37	632-0345-00	Idler	2
38	743-1200-00	E-Ring (M1.2)	4
39	746-0628-00	Special washer	2
40	750-1466-00	Spring	1
41	345-2405-00	Mechanism stopper rubber	1
42	632-0346-00	Link pin	2
43	630-0598-00	Link	2
44	743-1500-00	E-Ring (M1.5)	2

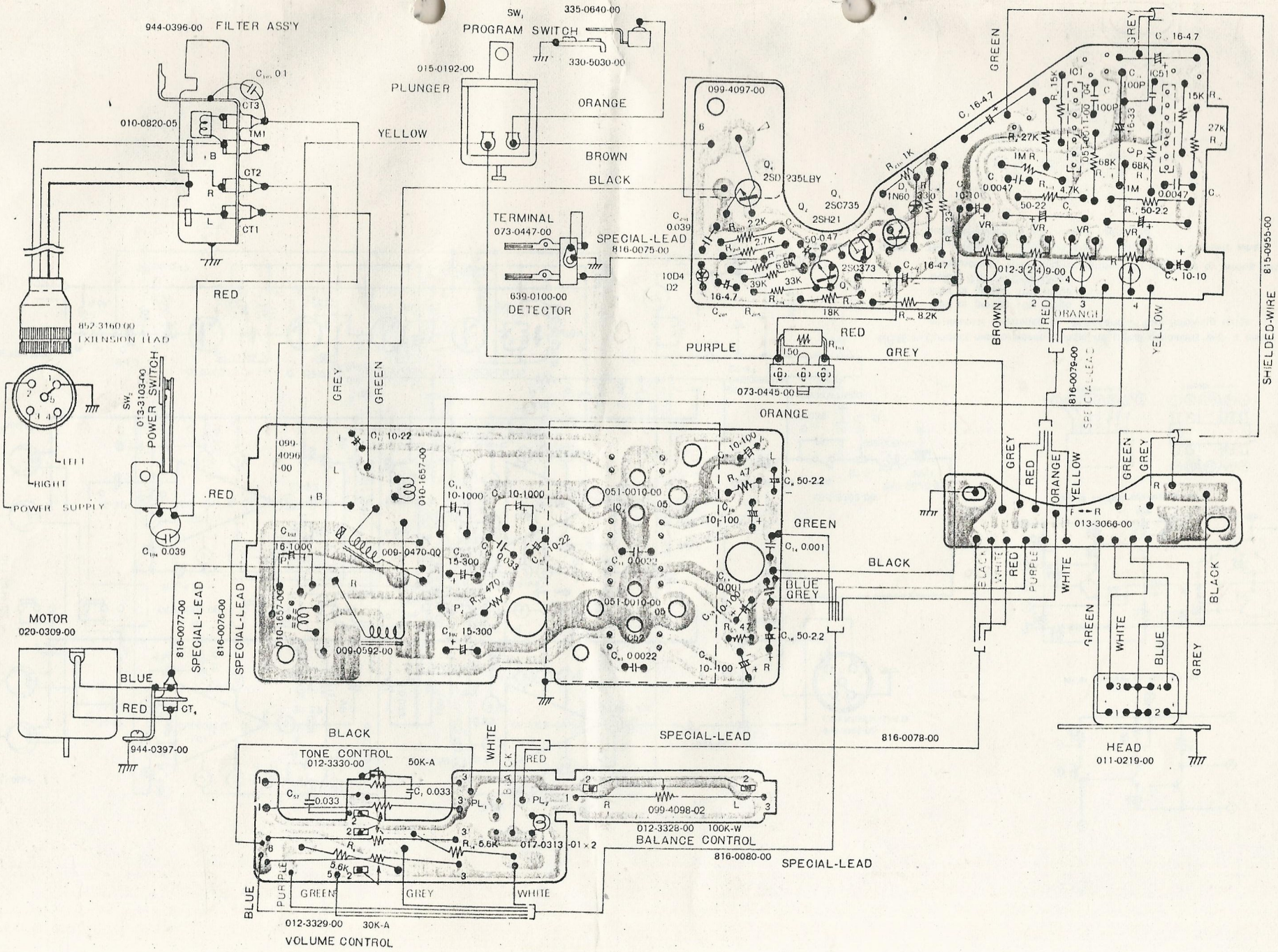
REF. NO.	PART NO.	DESCRIPTION	P.C.S
45	073-0447-00	Terminal	1
46	631-0100-01	Detector	1
47	750-1463-00	Spring	2
48	632-0344-00	Guide pin	2
49	750-1498-00	Spring	2
50	632-0158-00	Pin	2
51	607-0019-00	Housing	1
52	741-2600-21	Spring washer (M2.6)	5
53	714-2604-11	Machine screw (M2.6 x 4)	5
54	631-0102-00	Stopper	1
55	602-0022-00	Flat belt	1
56	750-1468-00	Spring	1
57	750-1465-00	Spring	1
58	610-0053-00	Roller	1
59	603-0027-00 603-0035-00	Motor pulley	1
60	020-0309-00 020-0320-00	Motor	1
61	728-2025-88	Rivet (M2 x 2.5)	4
62	750-1467-00	Spring	2
63	609-0033-00	Bearing	2
64	631-0101-00	Contact	2
65	714-3006-81	Machine screw (M3 x 6)	3
66	630-0597-00	Flywheel mount plate	1
67	746-0624-00	Special washer	2
68	611-0029-00	Flywheel	2
69	610-0016-01	Roller	1

NOTE: Motor pulley 603-0027-00, Motor 020-0309-00 Pair use
Motor pulley 603-0035-00, Motor 020-0320-00 Pair use

* MECHANISMS ASSEMBLIES PARTS LIST:

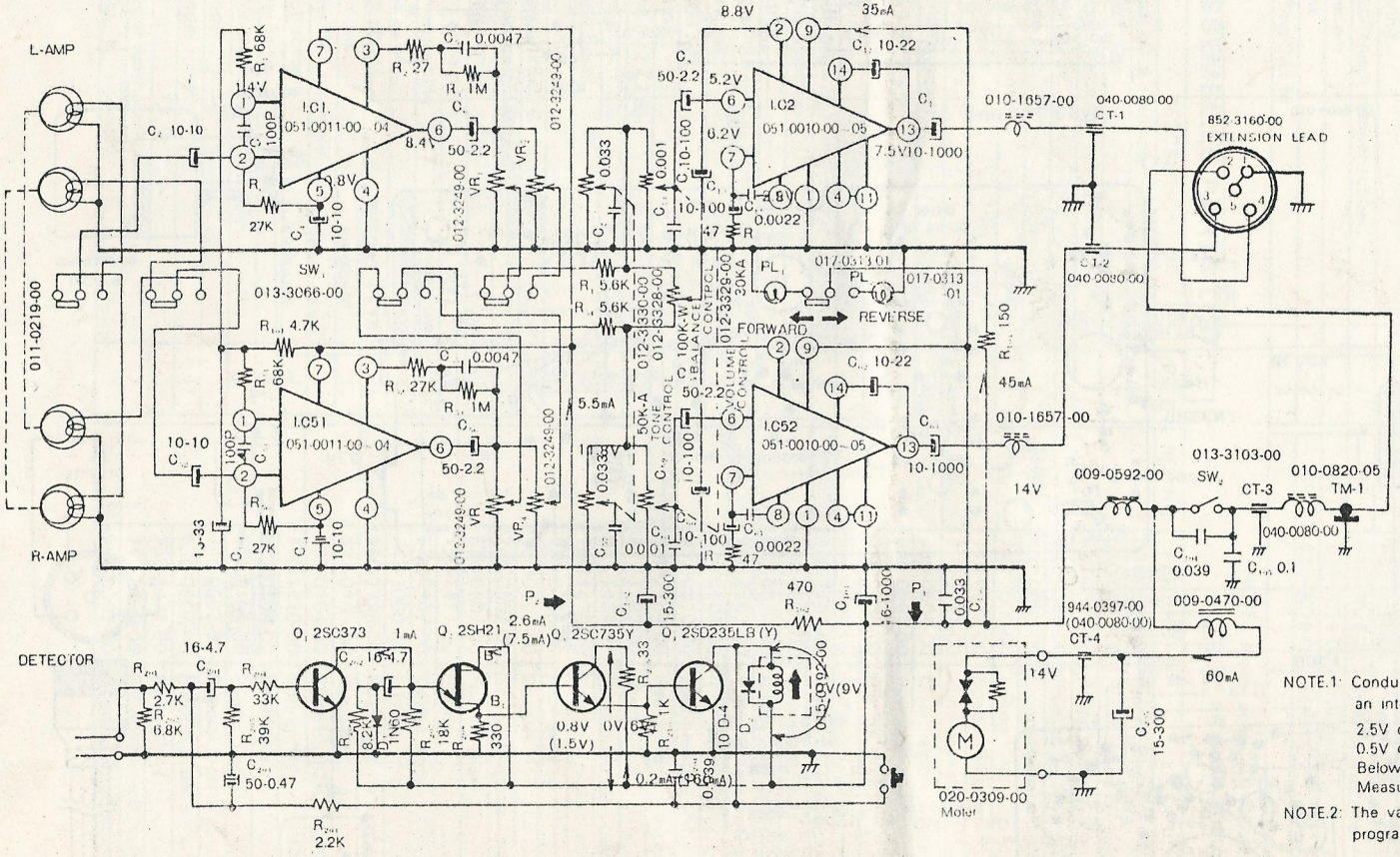
REF. NO	PART NO.	DESCRIPTION	P.C.S
A	960-2775-00	Deck plate assembly	1
	600-0048-00	Deck plate	1
	632-0347-00	Lock plate shaft	1
	632-0348-00	Plate guide	2
	632-0349-00	Guide pin	1
	632-0350-00	One way shaft	1
	632-0351-00	Cam pivot	1
	632-0352-00	Lever guide	1
	632-0353-00	Switch support	2
	632-0354-00	Slide plate pin	2
	632-0355-00	Head base	1
	750-1469-00	Spring	1
	728-2225-88	Rivet (M2 x 2.5)	2
B	960-2776-00	Panel assembly	1
	630-0599-00	Panel	1
	632-0356-00	Lock shaft	1
	632-0357-00	Idler pivot	2
	632-0349-00	Guide pin	1
	750-1469-00	Spring	1
	728-2025-88	Rivet (M2 x 2.5)	2
	632-0358-00	Reel shaft	2
	632-0359-00	Guide bush	2
	632-0360-00	Supporter	2
	632-0361-00	Roller shaft	1
C	960-2777-00	Cam plate assembly	1
	630-0600-00	Cam plate	1
	632-0362-00	Cam plate pin	1
D	960-2778-00	Cam assembly	1
	630-0601-00	Cam	1
	632-0363-00	Cam shaft	1
	632-0364-00	Cam pin	1
E	960-2779-00	Roller "A" assembly	1
	601-0004-01	Pinch roller	1
	630-0602-00	Roller case "A"	1
	632-0365-00	Roller shaft	1
	632-0366-00	Stopper	1
	631-0083-00	Stopper roller	1
	743-2000-00	E-Ring	3
	746-0617-00	Special washer	2
F	960-2780-00	Roller "B" assembly	1

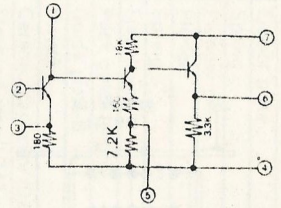
REF. NO.	PART NO.	DESCRIPTION	P.C.S
	601-0004-01	Pinch roller	1
	630-0603-00	Roller case "B"	1
	632-0365-00	Roller shaft	1
	632-0366-00	Stopper	1
	631-0083-00	Stopper roller	1
	743-2000-00	E-Ring	3
	746-0617-00	Special washer	2
G	960-2781-00	Plate assembly	1
	630-0604-00	One way plate	1
	632-0367-00	Pin "A"	1
	632-0368-00	Pin "B"	1
	632-0369-00	Bush	1
H	960-2782-00	Plate "A" assembly	1
	630-0605-00	Idler plate "A"	1
	632-0370-00	Idler shaft	1
I	960-2783-00	Plate "B" assembly	1
	630-0606-00	Idler plate "B"	1
	632-0370-00	Idler shaft	1
J	960-2784-00	Reel base "A" assembly	1
	631-1103-00	Bush	1
	631-1104-00	Slide bush	1
	750-1470-00	Spring	1
	631-0105-00	Reel base	1
	631-0106-00	Pulley	1
	745-0502-00	Special washer	1
	630-0607-00	Friction plate	1
	750-1471-00	Spring	1
	631-0107-00	Detect plate	1
	743-3000-00	E-Ring	1
K	960-2785-00	Reel base "B" assembly	1
	631-0103-00	Bush	1
	631-0104-00	Slide bush	1
	750-1470-00	Spring	1
	631-0105-00	Reel base	1
	631-0106-00	Pulley	1
	745-0502-00	Special washer	1
	630-0607-00	Friction plate	2
	750-1471-00	Spring	1
	743-3000-00	E-Ring	1
L	944-0397-00	Filter assembly	1

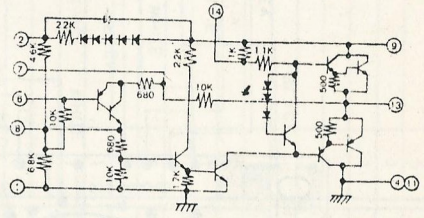


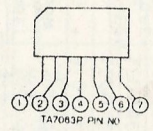
*** PRINTED CIRCUIT BOARD** (Refer to CIRCUIT DIAGRAM)

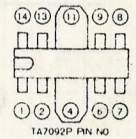
* CIRCUIT DIAGRAM: Refer to the troubleshooting procedure (Voltage and current values entered.)











NOTE.1: Conduct measurements. Under no signal conditions with a tester an internal resistance of 4KΩ/V and at the following renge.

2.5V or greater 10V range.
0.5V or greater 10V range.
Below 0.5V 0.5V range.
Measurement Value may be different, if measured by wrong range.

NOTE.2: The values in parentheses are the voltages and currents when program switching operation is conducted.