

CAR STEREO SERVICE MANUAL

ALL TRANSISTOR ENDLESS STEREO TAPE PLAYER 8 TRACK

MODEL PE-404 · PK-401

CLARION SHOJI CO., LTD. NEW KOJIMACHI BLDG., 3, 5-CHOME, KOJIMACHI, CHIYODA-KU, TOKYO, JAPAN
PHONE NO. 265-2931~4

2306 COTNER AVENUE, LOS ANGELES, CALIF., 90064, U.S.A. PHONE NO. 272-1178. 272-1169. 479-5556



* SPECIFICATION

Reproduce system : 8 track, 4 channel stereo

Tape speed : $3\frac{3}{4}$ " (9.5 cm/sec.)

Wow and flutter : Less than 0.3 % (audio component)

Maximum output : More than 4 W \times 2

Strain rate : Less than 10 % (output : 2.5 W)

S/N ratio : Better than 40 dB

Power amplification : Greater than 100 dB

Cross-talk between right and left channels :
Better than 30 dB

Cross-talk between adjacent channels :
Better than 40 dB

Frequency range : 50 ~ 7,500 c/s

Output impedance : 4 ~ 8 Ω

Power supply : 14.0 V.DC (negatively grounded)

Current consumption : Less than 1.4 A

Semiconductors : 10 transistors, 1 diode, 4 thermistors

Weight : 6.6 LbS (3 kg)

Dimensions : Width : $7\frac{25}{32}$ " (200 mm body bracket)

$6\frac{5}{8}$ " (190 mm body)

Height : $3\frac{3}{8}$ " (80 mm body)

Depth : $6\frac{5}{8}$ " (190 mm from the end of the knob)

* CONTENTS

PA-401-202	Car stereo body	1 set
850-109-001	Connecting cord	1 set
921-125-000	Accessory kit	1 set
300-049-000	Body bracket	1 EACH

* FEATURES

1. One-hand System

This superb car stereo is the result of the traditional engineering and reasearch of CLARION, the pioneer in car stereos, and can be installed in all types of vehicles. It boasts easy operation and complete safety during vehicle operation.

2. Special Design

The use of a high quality, temperature and vibration proof mechanism assures perfect operation and perfomance even on rough gravel roads and in cold northern climates.

3. Channel Indicator

The channel being used is indicated by a channel indicator with a soft light.

The decoration over the indicator lamp prevents the light from dazzling the drivers eye even at night.

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4. Powerful Output

A special powerful output OTL circuit is employed to faithfully amplify and reproduce the dynamic sound on the tape.

5. Silicon Planar Transistors Used

All circuits are made trouble free by the use of silicon planar transistors.

6. Power is automatically turned on (or off) by inserting (or removing) the stereo pack.

7. Four selection can be done by the left knob with which volume control is combined.

* **PART NAME** (Refer to Fig.1)

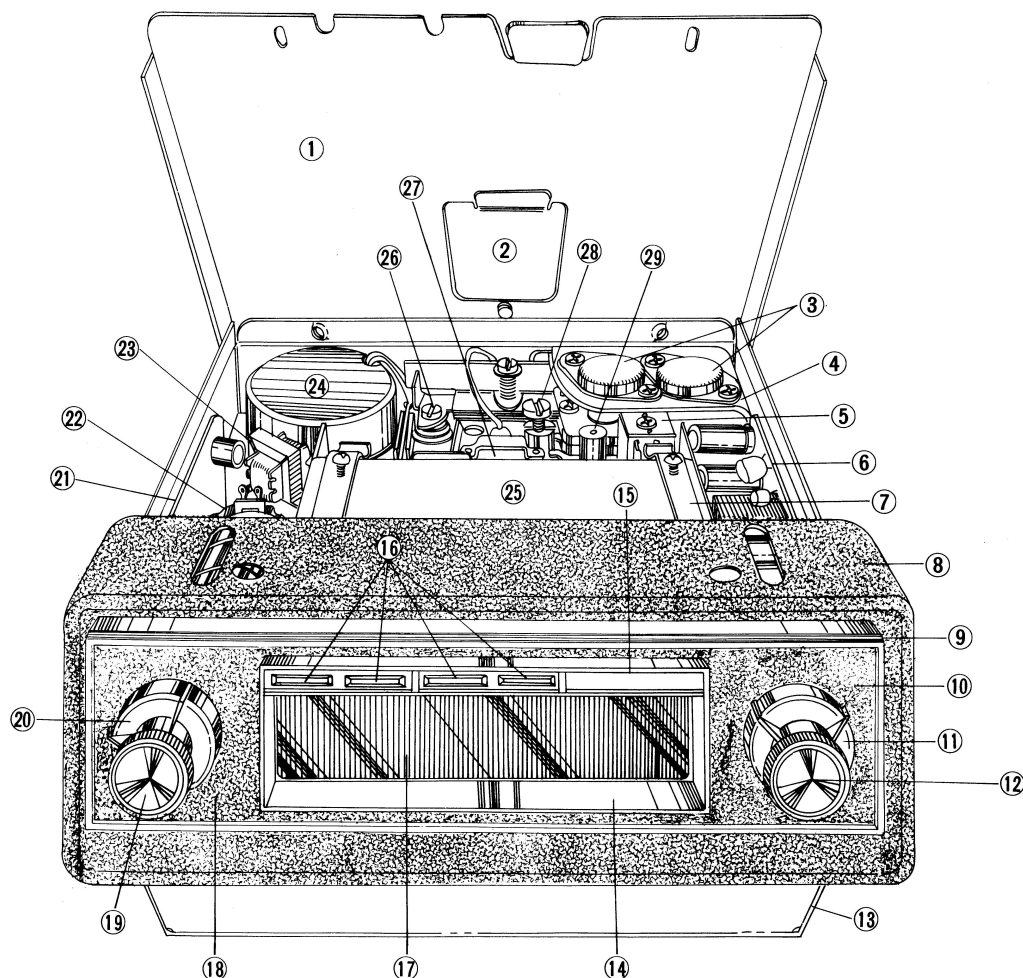


Fig. 1

① Upper plate	(303-015-000)	①⑦ Tape slot door	(320-001-000)
② Upper cover	(330-006-100)	①⑧ Decorative panel	(371-082-000)
③ Power transistor	(2SB337)	①⑨ Volume control knob (inner)	(380-212-000)
④ Radiator plate	(313-040-100)	②⑩ Sound quality control knob (outer)	(380-213-000)
⑤ Actuator holder	(33870)	②⑪ Printed circuit board at preamplifier side	(099-246-000)
⑥ printed circuit board at main amplifier side	(099-247-000)	②⑫ Variable resistor to for volume, sound quality.	(012-224-000)
⑦ Pack support	(360-372-000)	②⑬ Choke	(009-039-002)
⑧ Body bracket	(300-281-001)	②⑭ Motor assembly	(960-063-000)
⑨ Escutcheon	(370-198-000)	②⑮ Cartridge guide	(960-064-000)
⑩ Decorative panel (right)	(371-081-000)	②⑯ Head azimuth adjusting screw	
⑪ Separation control knob (Outer)	(380-213-000)	②⑰ Reproduce head	(011-012-000)
⑫ Separation control knob (Inner)	(380-212-000)	②⑱ Head height adjusting screw	
⑬ Lower case	(3110-025-001)	②⑲ Capstan	
⑭ Escutcheon	(370-193-100)		
⑮ Decorative panel			
⑯ Pilot decoration	(375-031-100)		

* OPERATING PROCEDURE (Refer to Fig.2)

STARTING

Inserting the stereo pack ① into the stereo pack slot door in front of the escutcheon depresses automatically the power switch and the power is turned on. At the same time one of the indicator lamps ② lights and the music starts.

CHANNEL SWITCHING

The channel is switched either automatically or manually because of the plunger employed in the mechanism.

* AUTOMATIC SWITCHING

When the silver section of the stereo pack tape passes through the solenoid contact, the plunger is actuated and automatically changes the channel.

* MANUAL SWITCHING (Refer to Fig.2)

By lightly depressing the channel selection knob ③, the plunger is actuated to change the height of the head and switch the channel.

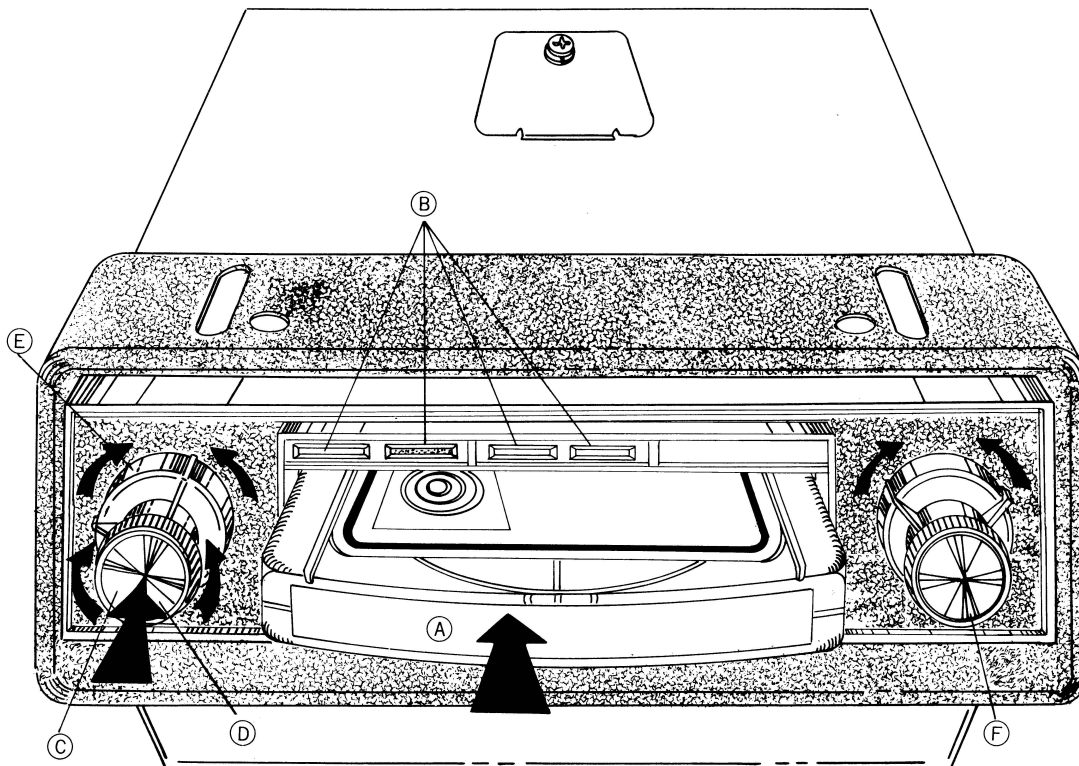


Fig. 2

* CHANNEL INDICATOR LAMP AND HEAD POSITION

The left channel indicator lamp ② lights to indicate that tracks 1 and 5 are being reproduced and the next lamp from the left lights to indicate that the tracks 2 and 6 are being reproduced. The channel indicator and head positions are as shown Fig. 3.

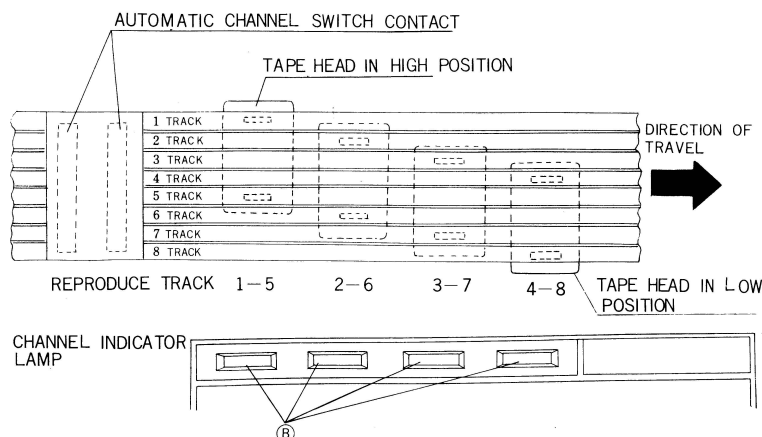


Fig. 3

*** VOLUME ADJUSTMENT**

Turning the inner knob (the volume control knob ① at the left and in front of the escutcheon panel) clockwise, increase the volume and turning it counterclockwise decrease the volume.

*** TONE ADJUSTMENT**

The treble notes are emphasized by turning the outer knob (the sound quality control knob ②) at the left and in front of the escutcheon panel, clockwise and the bass notes emphasized by turning it counterclockwise.

*** SEPARATION CONTROL ADJUSTMENT**

The volume from the right speaker is increased by turning the knob (the separation control knob ③) at the right and in front of the escutcheon panel, clockwise and the from the left speaker is increased by turning it counterclockwise. Adjust the separation control knob so that the sound from the right and left speakers is heard as if you were standing in the center.

*** STOPPING (Refer to Fig.4.)**

The power is automatically turned off by pulling the stereo pack ④ forward.

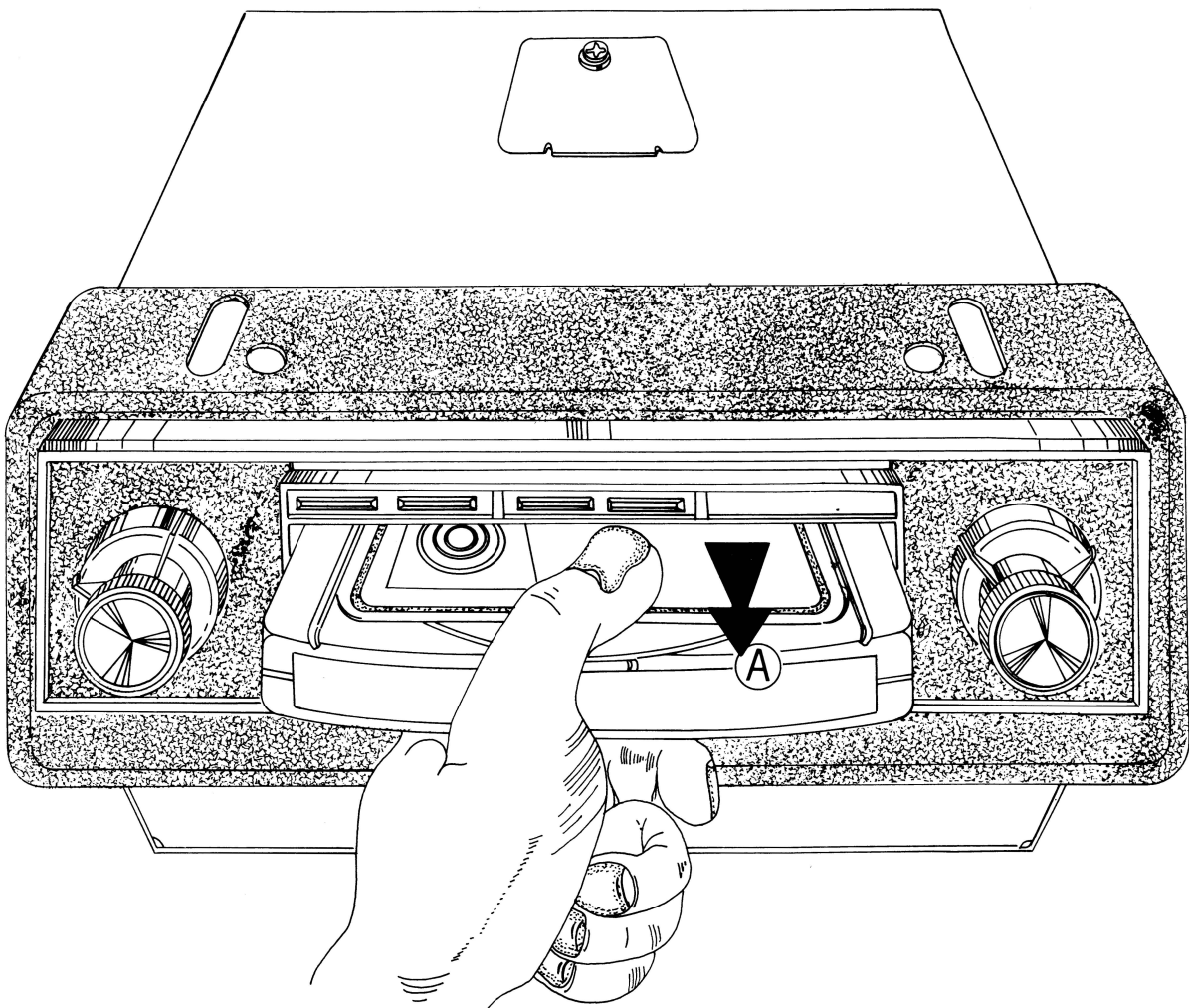


Fig. 4

*** ADJUSTMENT**

● Adjustment of right and left side channel amplifier outputs.

Tapped holes are provided at the left side of the car stereo body to adjust the outputs of the right and left side channels. Insert the pick-up tongs or insulated driver into the hole. Turn it clockwise to increase the output.

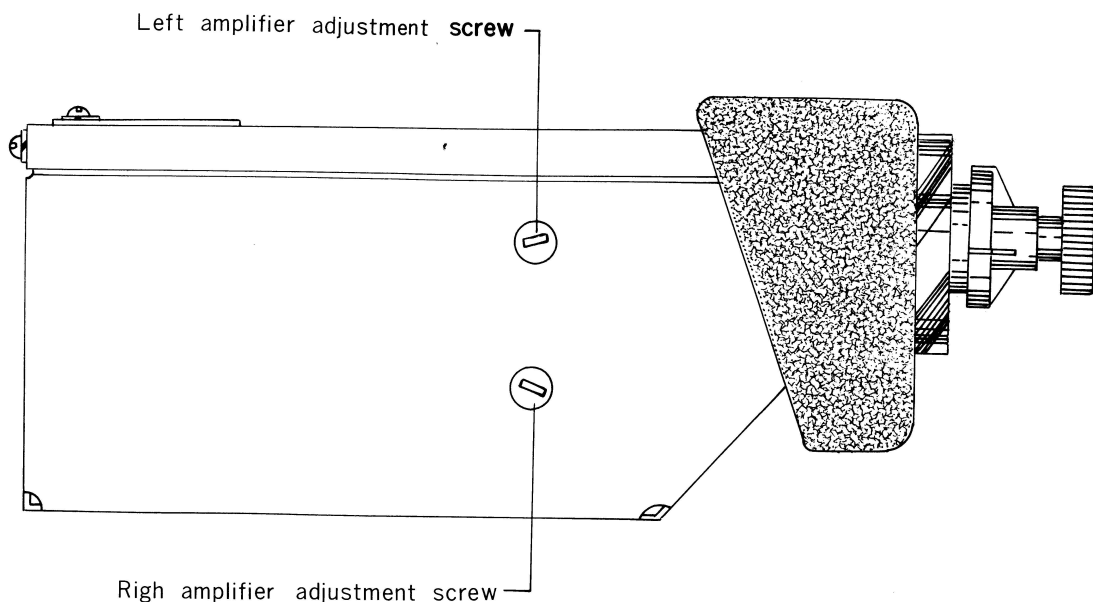


Fig. 5

- Head height and azimuth adjustments are performed with the upper cover of the case top removed. (The body case need not be removed.) (Refer to Fig. 6.)

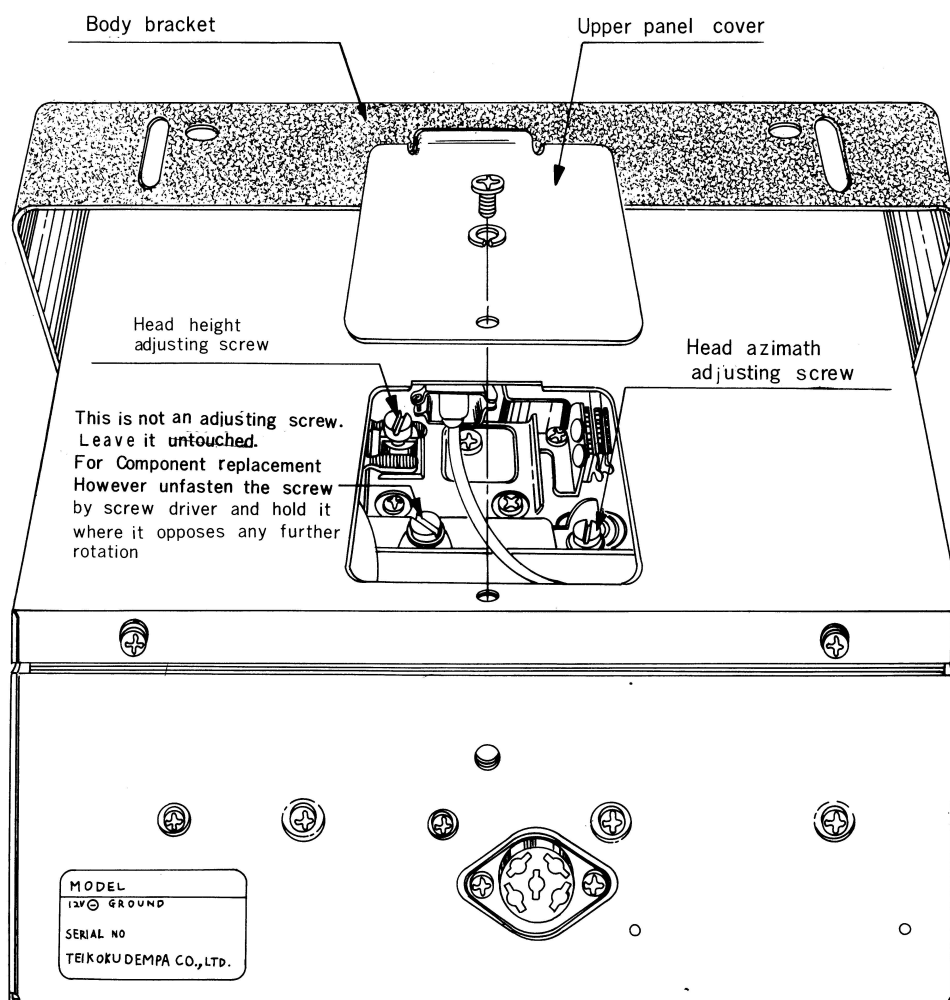


Fig. 6

- Head height and angle adjustments (Refer to Figs. 7 and 8.)

The sound volume will be low when the position and angle of the head, in respect to the tape, incorrect. Tone is degraded and cross-talk also appears. In this case, adjust the height of the head by means of the height adjusting screw and the azimuth with the azimuth adjusting screw, located on the back of the head.

- When a test tape is available (Adjust in 8 track.)

A. Insert the two channels of the height adjusting tape (tracks 2 and 6) and position the head at the second channel from the top. Adjust the height adjusting screw for maximum output. Insure that the output is also maximum at the other channels.

B. Insert the azimuth adjusting tape and adjust for maximum output by means of the azimuth adjusting screw.

NOTE: The height adjustment may be affected by the azimuth adjustment, therefore, recheck the height.

- When a test tape is not available (Adjust in 8 track.)

Insert the stereo pack (8 track) and position the head to the upper most point (Channel 1: tracks 1 and 5). Slowly turn the height adjusting screw for maximum volume at the channel 1: tracks. 1 and 5.

Insure that the volume is also maximum at the other channels.

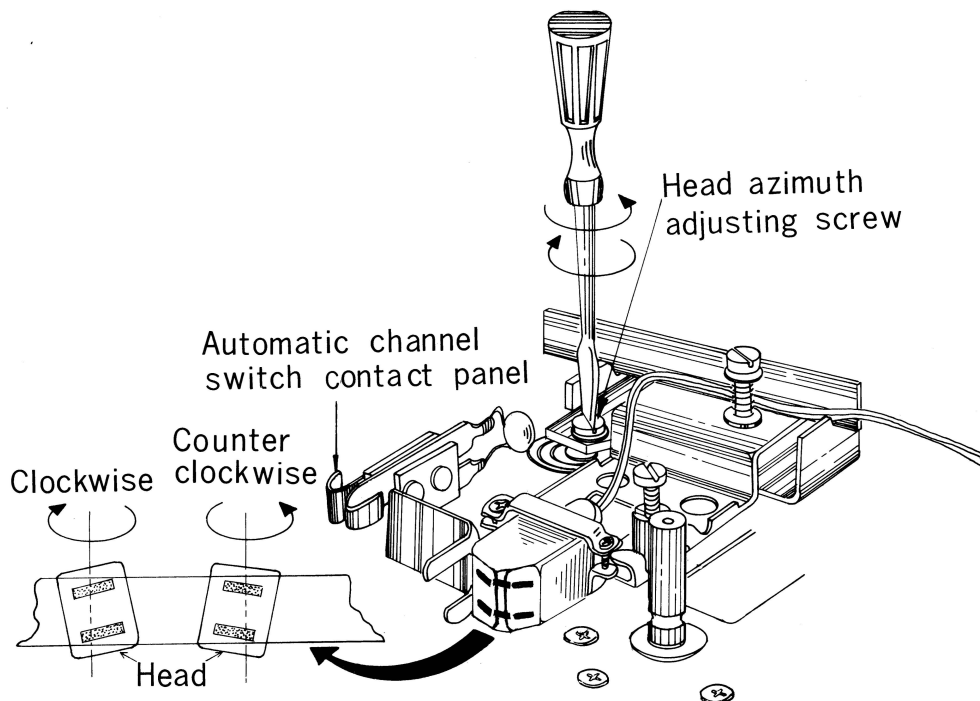


Fig. 7

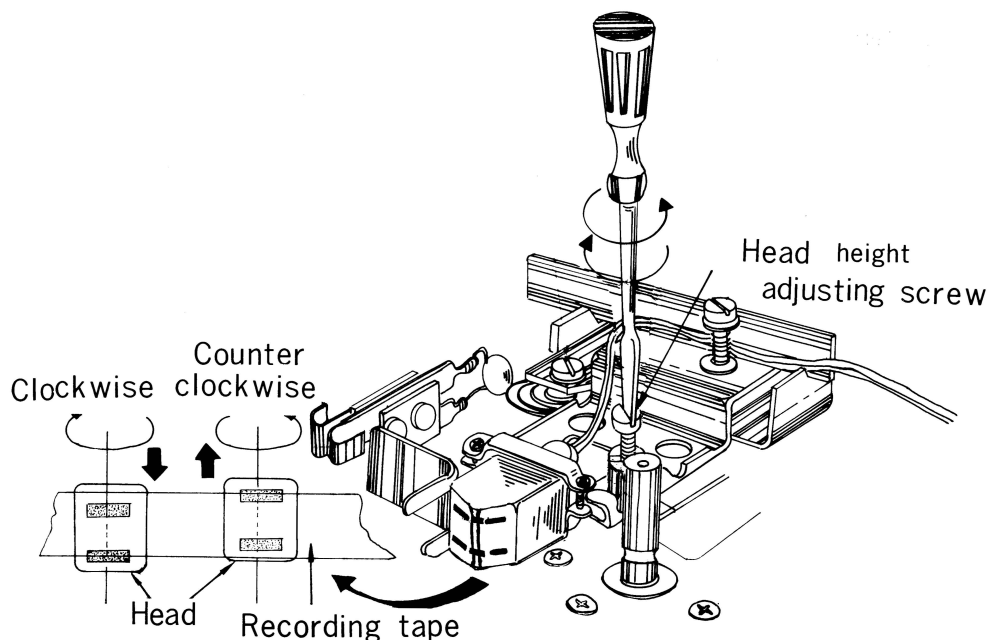


Fig. 8

* HANDLING PRECAUTIONS

- If a fuse blows, replace with a fuse of the specified rating (3 A).
- Although the stereo pack is humidity resistant, keep it away from water in the case of rain or vehicle cleaning.

* INSTALLATION OF UNIT

IN-DASH

When recessing the car stereo in the instrument panel, process the instrument panel as shown in Fig. 9 and install the car stereo as shown in Fig. 10.

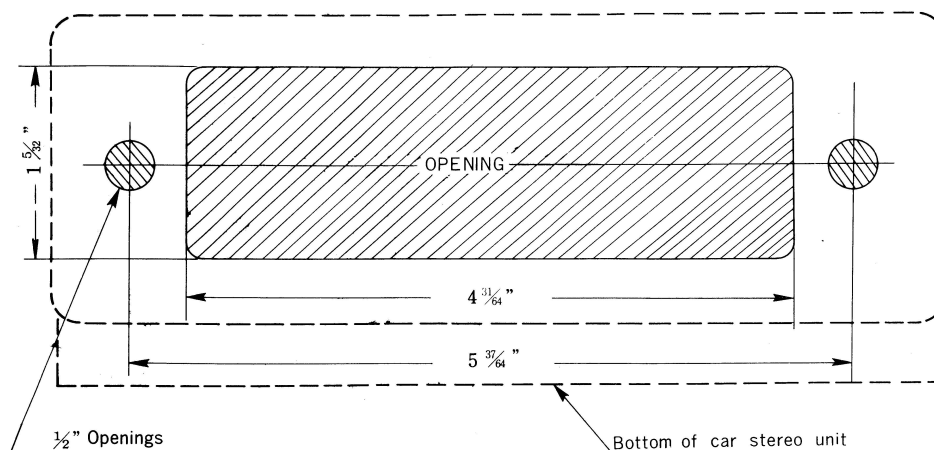


Fig. 9

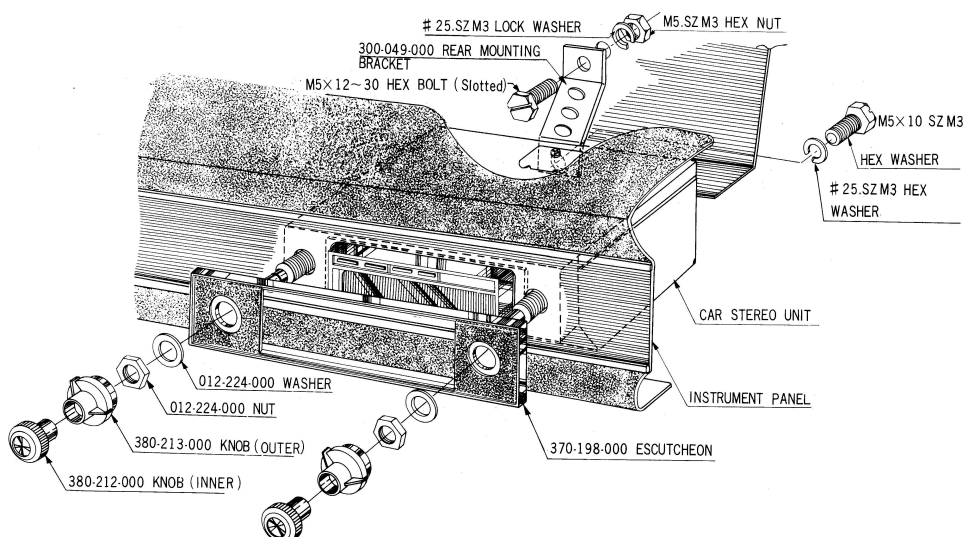


Fig. 10

UNDER-DASH (Refer to Fig.11.)

The car stereo may also be installed under the instrument panel.

Suspend the car stereo with the bracket at a position where it does not interfere with driving.

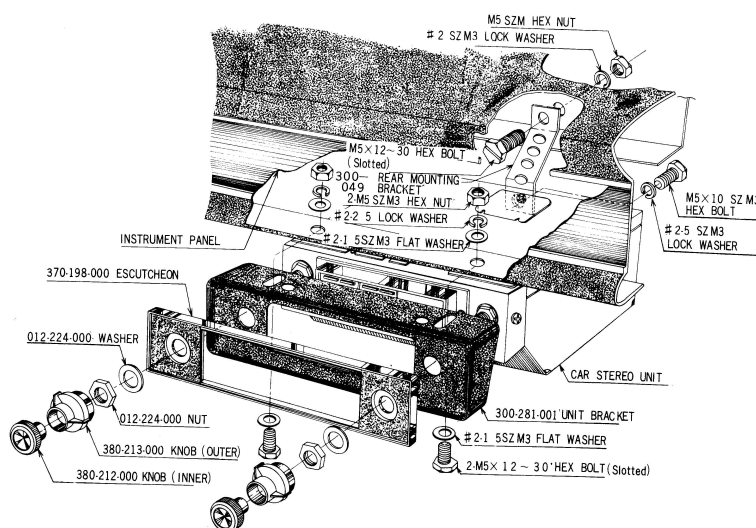


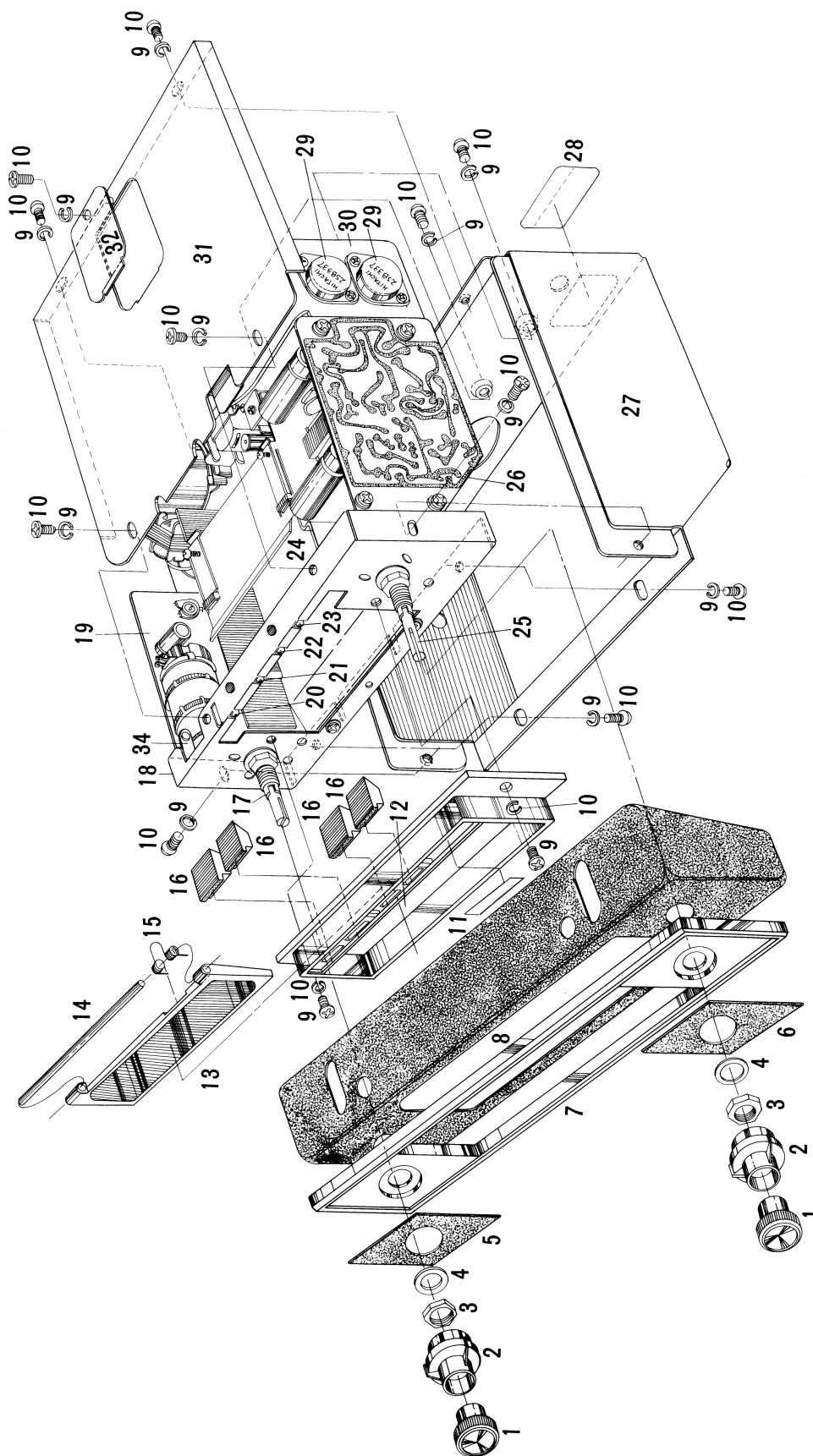
Fig. 11

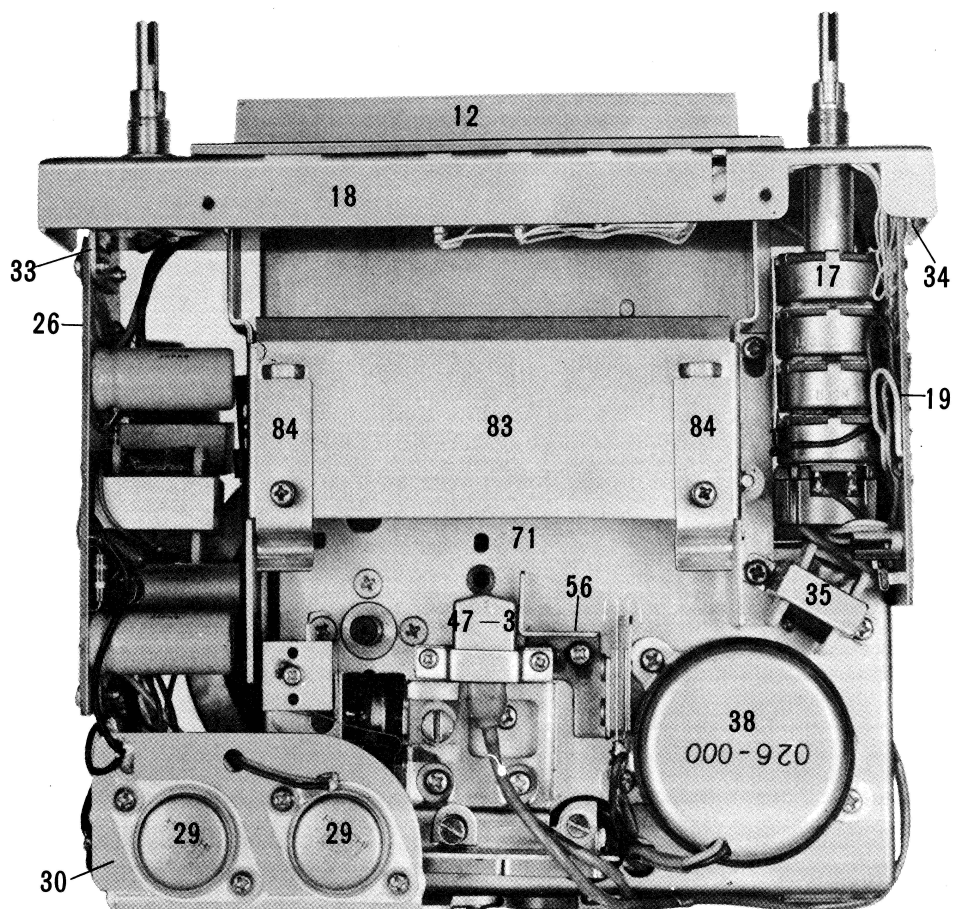
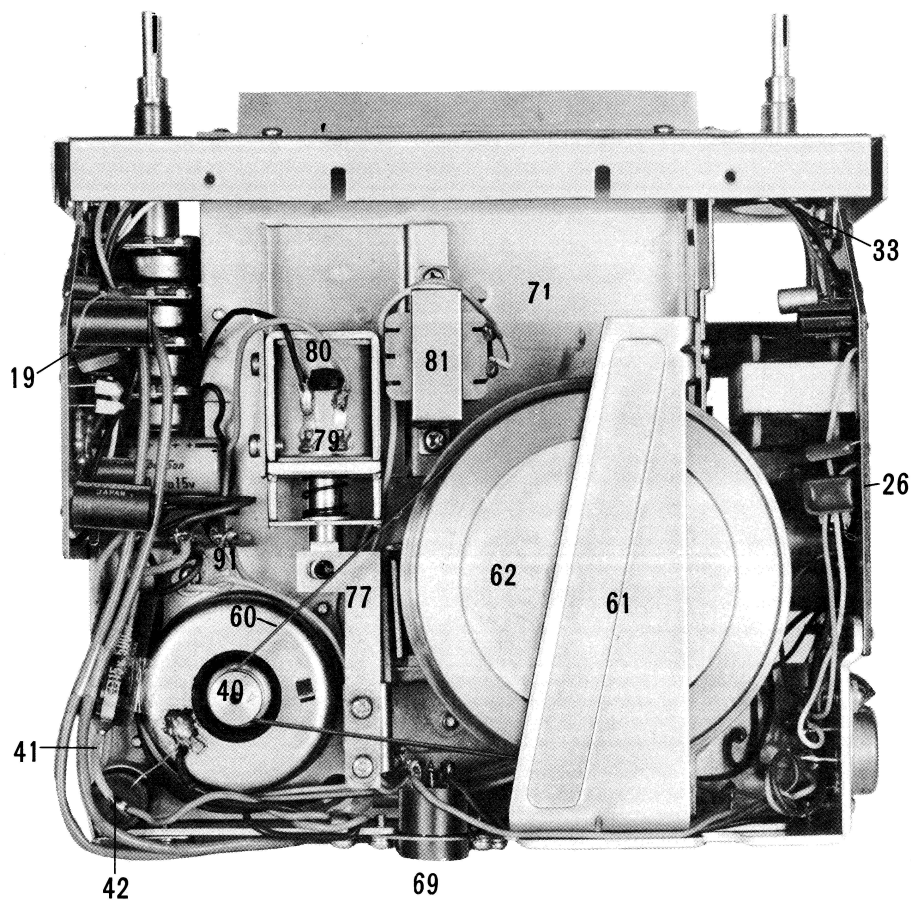
***REFERENCE FOR TROUBLE SHOOTING (Refer to the circuit diagram)**

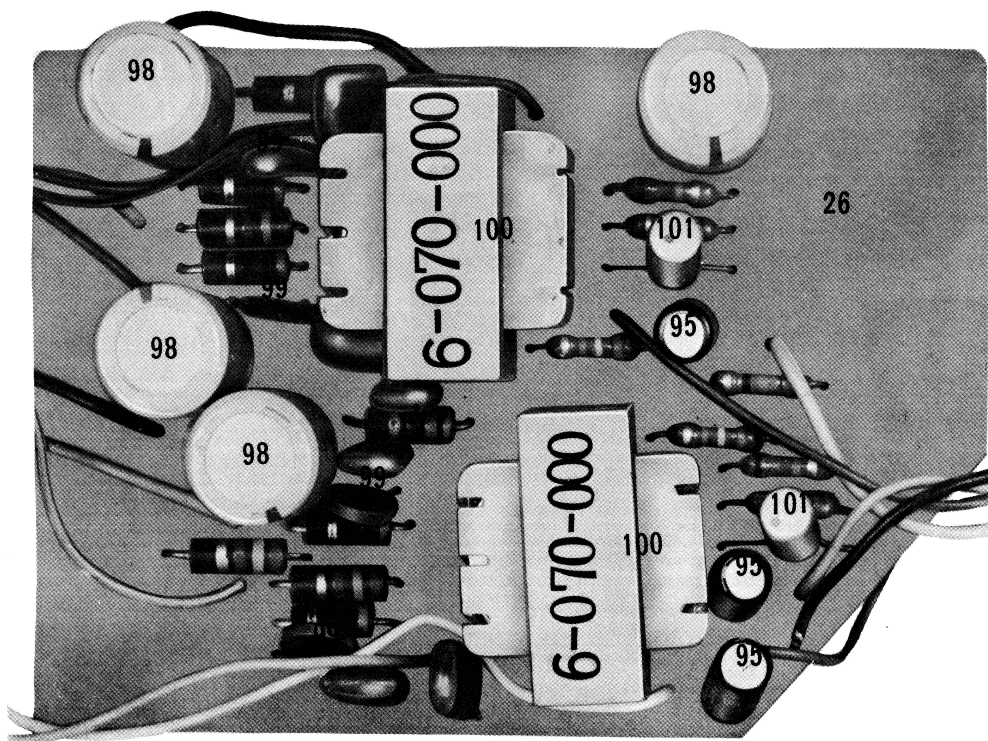
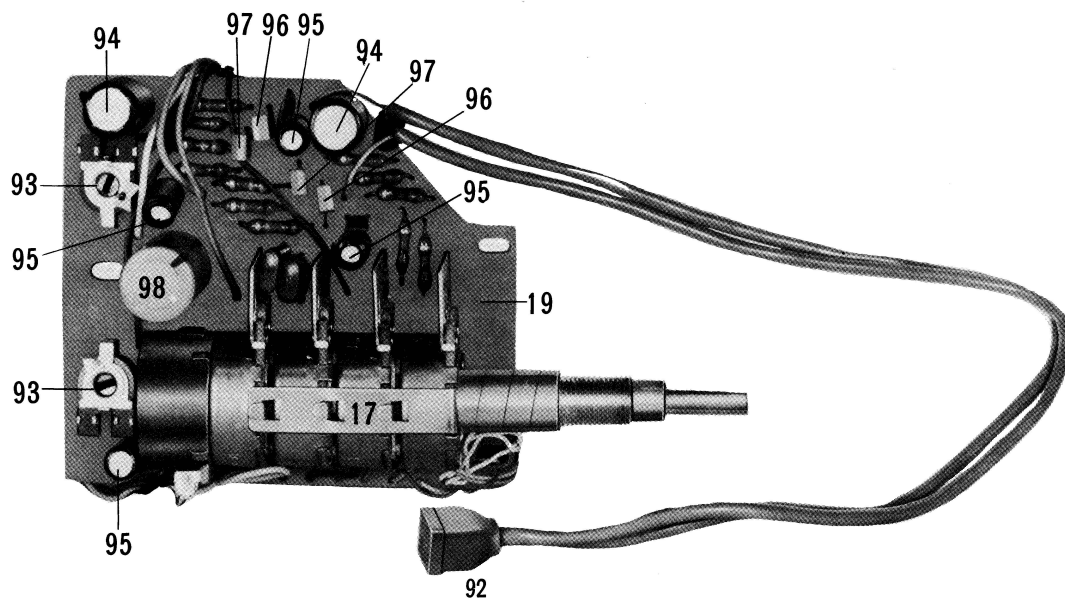
Trouble	Defective Circuit	Defects and Cause	Corrective Action
No output	Power supply	<ul style="list-style-type: none"> ●Power supply filter coil (009-038-000) open ●Contact point or power switch (013-210-000) mechanism defective ●Output connector contact (074-018-00) open ●C101, C102, or C103 open ●P101 or R102, open or resistance change 	Replace " " " "
	Output	<ul style="list-style-type: none"> ●Speaker voice coil open ●C10 or C60 open ●2SB337 open or shorted ●R14 or R15 (R64 or R65) leads open ●Input transformer (006-020-000) primary or secondary winding open or shorted 	Replace " " " "
	Driver	<ul style="list-style-type: none"> ●2SC281 open or shorted ●C6 or C56 open or shorted ●012-224-000 faulty 	Replace " "
	Preamplifier	<ul style="list-style-type: none"> ●2SC458 faulty ●012-159-000 open or shorted ●C2, C3 or C5 (C52, C53 or C55) open or shorted ●011-012-000 leads open or shorted 	Replace " " Replace or repair leads
Low output	Driver output	<ul style="list-style-type: none"> ●2SC281 or 2SB337 faulty ●R7 or R57 resistance change ●C10 or C60 defective 	Replace " "
	Preamplifier	<ul style="list-style-type: none"> ●2SC458 defective ●R2, R3, or R6 (R52, R53, or R56) resistance change ●011-112-000 sensitivity poor ●C3 or C53 defective 	Replace " " "
Treble tones drop out	Preamplifier	<ul style="list-style-type: none"> ●Head azimuth defective ●Head (011-012-000) defective ●C1 or C51 capacitance change or open 	Adjust Replace "
Bass tones drop out	Feedback	<ul style="list-style-type: none"> ●C4 or C7 (C54 or C57) capacitance change or shorted ●R9 or R59 open or resistance change ●R2 or R52 open 	Replace " "

Trouble	Derective Circuit	Defects and Cause	Corrective Action
Distorted output	Driver output	<ul style="list-style-type: none"> ● 2SB337 defective or unbalanced push-pull transistors ● C10, C8, or C9 (C60, C58, or C59) shorted ● TD-14 (002-014-000) defective, or R7 or R57 resistance change ● Input transformer (006-070-000) primary or secondary winding open or shorted ● R10 (R60 R62) open or shorted ● R11 or R13 (R61 or R63) open or shorted 	Replace " " " " "
	Preamplifier	<ul style="list-style-type: none"> ● R2, R3, or R6 (R52, R53, or R56) resistance change ● 2SC458 defective ● C2, C3, or C5 (C52, C53, or C55) shorted 	Replace " "
Player oscillates	Power supply	<ul style="list-style-type: none"> ● C101, C102, or C103 capacitance change ● R101, or R102 resistance change or shorted 	Replace "
	Driver output	<ul style="list-style-type: none"> ● R8 or R58 open ● R9 or R59 resistance change or shorted ● C8 or C9 (C58 or c57) open 	Replace " "
	Preamplifier	<ul style="list-style-type: none"> ● Head leads defective ● 012-224-000 defective ● 012-159-000 defective 	Replace or repair leads Replace "
Heads are not switched	Plunger	<ul style="list-style-type: none"> ● Plunger switch contact defective or defective mechanism ● SH-1 shorted ● Plunger (015-005-000) coil layer-shortcd ● Contact spark-killer capacitor (0.05 μF) defective 	Replace " " "

*EXPLODED VIEW (See parts List)



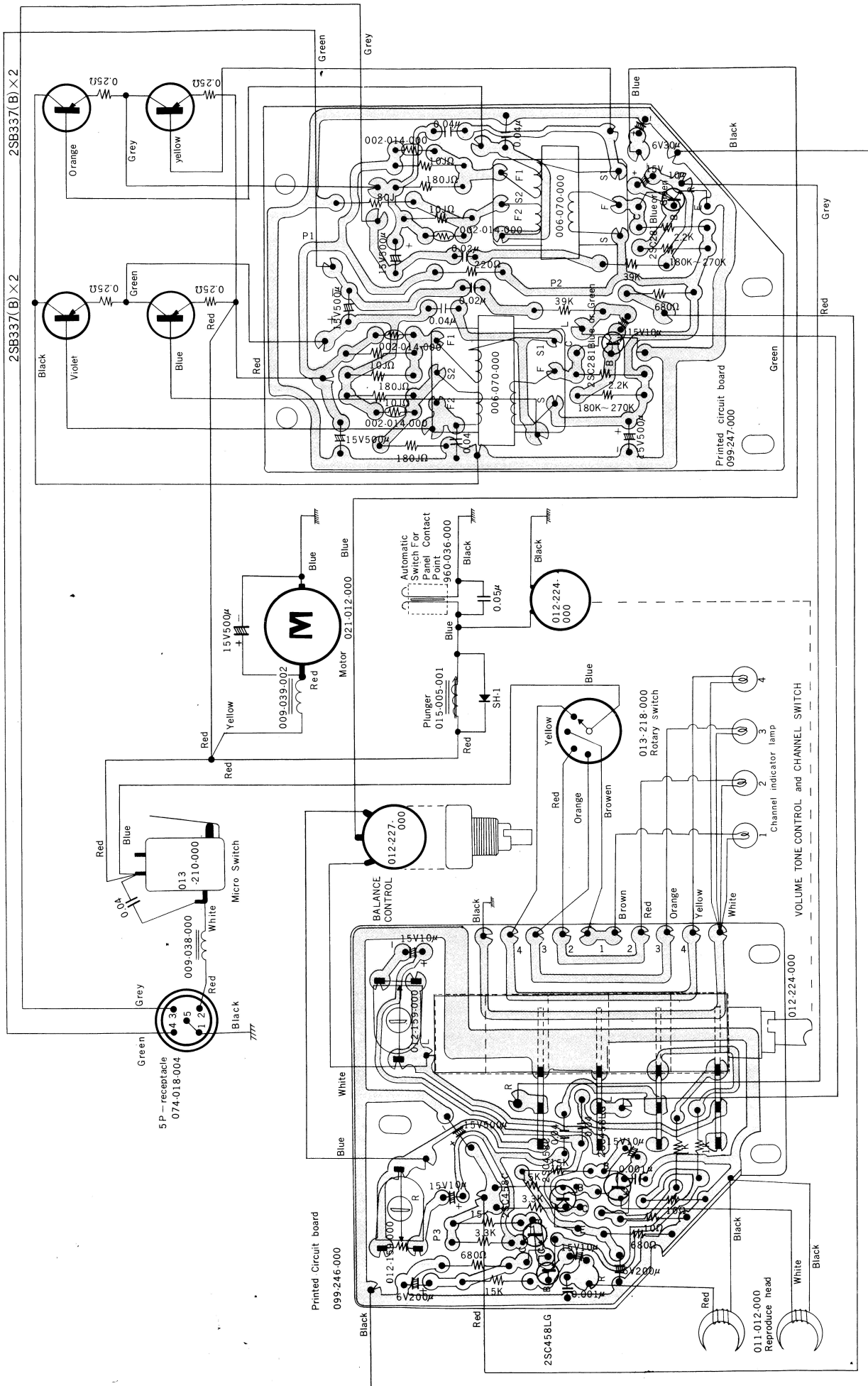




*** PARTS LIST** (Refer to the disassembly drawing and photo. The REF.NO in blue in this parts list are assemblies.)

REF No.	Part No.	Description	REF No.	Part No.	Description
1	380-212-000	Knob	66	M2.6	Lock washer
2	380-213-000	Knob	67	M2.6×25	Small panhead screw with cross head
3		Nut for variable resistor	68	B-4	Lug terminal
4		Washer for variable resistor	69	074-018-000	Plug socket (molded 5P)
5	371-082-000	Decorative panel(left)	70	2176001	Lead clamp
6	371-081-000	Decorative panel(right)	71	960-055-002	Deck plate assembly
7	370-198-000	Escutcheon	72	M3×16	Small panhead screw with cross head
8	300-281-001	Body bracket	73	50 V0 04	Titanium disc capacitor
9	M3×6	Small panhead screw with cross head	74	V-1 A442-2	Microswitch
10	#2-3	Spring washer	75	3403000	Switch spacer
11	371-073-000 371-018-000	Decorative panel (CLARION) (CLASONIC)	76	342601	Actuator 14-1
12	370-193-100	Escutcheon	77	360-277-000	Plunger base
13	320-001-000	Tape slot door	78	M3×0.5×8	Plain washer
14	CA-817-4524	Shaft	79	015-005-001	Plunger
15	750-153-000	Spring	80	SH-1	Diode
16	375-031-100	Pilot decoration	81	009-038-000	Choke
17	012-224-000	Variable resistor	82	960-006-001	Pack guide (right) assembly
18	308-041-001	Front panel	83	960-064-000	Cartridge guide assembly
19	099-246-000	Printed circuit board	84	360-372-000	Pack support
20	017-013-004	Pilot lamp (for channel 1)	85	360-285-000	Sleeve
21	017-013-000	Pilot lamp (for channel 2)	86	360-289-000	Sleeve spring
22	017-013-005	Pilot lamp (for channel 3)	87	M3×8	Small panhead screw with cross head
23	017-013-006	Pilot lamp (for channel 4)	88	315602	Head switching cam assembly 18
24	930-026-000	Tape mechanism assembly	88-1	M3 (#2)	Hexagon nut
25	012-227-000	Variable resistor	88-2	995030	Slide bushing 5
26	099-247-000	Printed circuit board	88-3	218101	Ratchet cam
27	311-025-001	Lower case	88-4	218602	Ratchet spring
28	286-193-000	Set plate (CLARION) (CLASONIC)	88-5	333600	Ratchet lever
29	2SB337	Power transistor	89	960-056-000	Rotary switch assembly
30	313-040-100	Radiator plate	89-1	M2.3×14	small panhead screw with cross head
31	303-015-000	Upper panel	89-3	341600	Cam tightening pin
32	330-006-100	Upper panel cover	89-4	360-317-000	Switch collar
33	330-106-000	Metal plate mounting printed circuit board	90	960-068-000	Cam bearing assembly
34	330-105-000	" " "	90-1	360-318-100	Cam bearing
35	009-039-002	Choke	90-2	995028	Slide bushing 3
36	M3×6	Small panhead screw with cross head	90-3	M3×12	Small panhead screw with cross head
37	M3×8	" " "	91	2P	T-Type lug terminal
38	960-063-000	Motor assembly	92	852-173-000	Connecting cord
39	M2.6×4	Set screw with hex head	93	012-159-000	Semi-fixed resistor
40	360-296-000	Pulley	94	VL6 V200 μFY	Electrolytic capacitor
41	360-293-000	Capacitor clamp	95	VL15 V10μFY	" " "
42	VL15 V 500μFY	Electrolytic capacitor	96	2SC58LG	Silicon transistor
43	M3×10	(-) fillester head screw	97	2SC458	" " "
44	#1-3	Plain washer	98	VL15 V 500μFY	Electrolytic capacitor
45	218308	Head stay	99	002-014-000	Thermistor
46	326602	Head stay spring	100	006-070-000	Input transformer
47	960-081-000	Head arm assembly	101	2SC281	Silicom transistor
47-1	M2.6×8	Small panhead screw with cross head		F-1	Fiber washer
47-2	216702	Head holder		347-002-000	Insulating paper (left)
47-3	011-012-000	Reproduce head		347-001-000	" " (right)
47-4	334102	Head arm 14		746-041-000	Power transistor insulating washer
47-5	216001	Head adjusting nut		330-104-000	Pilot lamp
48	247200	Head adjusting screw 14		M3×8 (#1)	Small panhead tapping screw with cross head
49	M3×25	(-) fillester head screw		M3×8 (#2) countersunk	" " "
50	083012	Plain washer		VL6 V30μFY	Electrolytic capacitor
51	217102	Head arm spring 8		50 V0.001μF ±20%	Mylar capacitor
52	226402	Screw collar 3		50 V0.02μF ±20%	Mylar capacitor
53	218701	Screw washer		50 V0.04μF ±20%	Mylar capacitor
54	50 V0.05μ	Titanium disc capacitor		50 V0.01μF ±20%	"
55	M3×4	Small panhead screw with cross head		½W 220Ω ±10%	Carbon resistor
56	960-132-000	Tape guide assembly		0.25Ω	Resistance wire
57	M3×10	Small panhead screw with cross head		¼W10Ω ±10% R-type	Carbon film resistor
58	341100	Bearing 14		" 680Ω "	" "
58-1	324600	Bearing washer 11		" 1KΩ "	" "
59	360-082-000	Nylon washer (B)		" 2.2KΩ "	" "
60	360-196-000	Belt		" 3.3KΩ "	" "
61	360-280-000	Flywheel retaining plate		" 15KΩ "	" "
62	960-060-000	Flywheel assembly		" 39K "	" "
63	338700	Actuator holder		¼10Ω ±5% R-type	" "
64	338604	Actuator		¼15Ω ±10% R-type	" "
65	338800	Holder cover			"

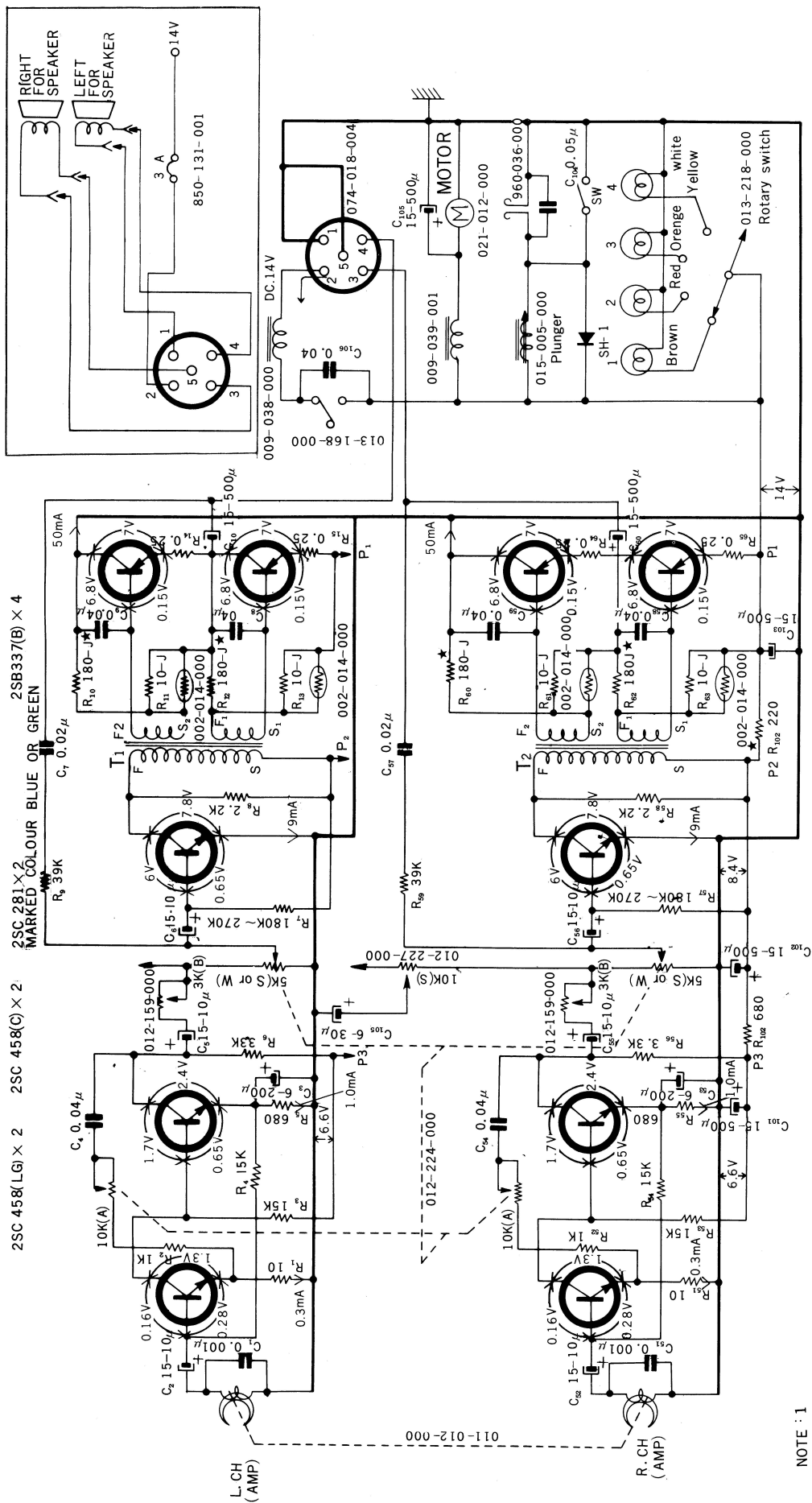
* PRINTED CIRCUIT BOARD



NOTE: CHANNEL INDICATOR LAMP PART. NO.

1. CHANNEL 017-013-004
2. CHANNEL 017-013-000
3. CHANNEL 017-013-005
4. CHANNEL 017-013-006

* SCHEMATIC DIAGRAM



NOTE : 1
Use a multimeter with an internal resistance of $4\text{ K}\Omega/\text{V}$ and set to

ranges of:

- 10V for measurements greater than 2.5V
- 2.5V for measurements greater than 0.5V,
- 0.5V for measurements less than 0.5V,

Ranges other than those specified may cause errors

2,

A. T1 and T2 are 006-070-000

A. 11 and 12 are 006-070-000
Prats designated ★ are carbon resistors $\frac{1}{2}W \pm 5\%$

C. Electrolytic capacitors have Y—characteristics