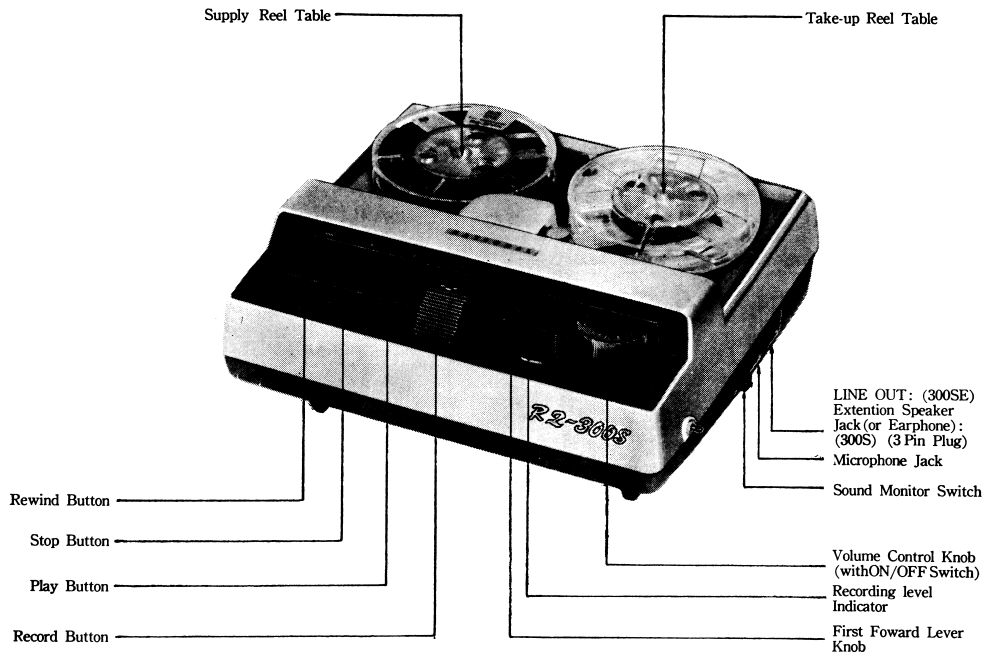


CONTROLS



R Q - 3 0 0 S

Fig. 1

SPECIFICATIONS

Power Source:	AC. 110 V 220 V, (50 %, 60 %)
Power consumption:	abt 10 W
Audio Output:	500 mw (Max 700 mw)
Transistors:	2SB-173(1) 2SB-175(2) 2SB-176(1) 2SB-178(2)
Thermistor:	QVM 250 (1)
Selenium Rectifier:	KC 2d22/1 (1)
Recording System:	AC Bias 35 KC
Erasure System:	DC Erasure
Track System:	Double Track Recording System
Operation System:	Push Button System
Tape Speeds:	3-3/4 ips. (9.5 cm/sec.) and 1-7/8 ips. (4.75 cm/sec.)
Playing Time:	20 min. at 3-3/4 ips. with National Standard 3" Tape (200 ft) 40 min. at 1-7/8 ips. with National Standard 3" Tape (200 ft)
Frequency Response:	100-7,000 c/s at 3-3/4 ips. 150-4,000 c/s at 1-7/8 ips.
Wow and Flutter:	Less than 0.4% (at 3-3/4 ips.)
Input Impedance:	Microphone 10 KΩ 1 circuit
Output Impedance:	8 Ω 1 circuit 300S (3 Pin Plug)
Fast Forward & Rewind Time:	within 3 minutes (at Rewind) within 4 minutes (at Fast Forward)
Built-in Speaker:	4" x 2-1/2" Wide Dynamic Speaker
Dimensions:	7-1/2 (d) x 8-1/4 (w) x 3-7/8 (h)
Weight:	4-3/8 lbs.

ACCESSORIES

Dynamic microphone	1	Handling belt	1
3" reel tape (RT-3)	1	Splicing tape	1
3" empty reel (RP-3)	1	2 Pin Plug (B)	1

MEASUREMENT AND ADJUSTMENT MECHANICAL PARTS

PINCH-ROLLER (Fig. 12)

- Set the unit in Playback or Record mode. (Tape speed: $3\frac{3}{4}$ i.p.s.)
 - Do not load Tape-reel.
 - Attach a thread to Pinch-roller.
 - Hook Spring Scale to the thread on Pinch-roller, and pull Pinch-roller in the direction of a line to connect the centers of Capst and Pinch-roller.
 - Take the reading of Spring Scale at a point where Pinch-roller and Capstan are apart.
- Pressure of Pinch-roller shall normally be:
 $250g \pm 30g$

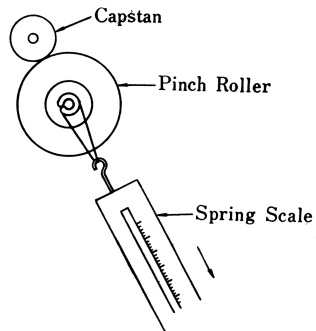


Fig. 12

ADJUSTMENT

Adjust Pinch-Roller Spring (Fig. 13)

- If the pressure is too weak, bend the point ① of Pinch-Roller Spring to the (B) arrow direction according to fig.
- too strong, bend it to the (A) arrow direction accordingly.

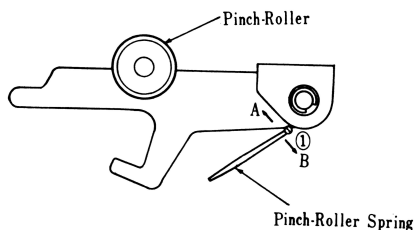


Fig. 13

IDLER (Fig. 14)

- Set the unit in Playback or Record mode.
 - Attach a thread to Idler.
 - Hook Spring Scale to the thread on Idler, and pull Idler in the perpendicular direction from connecting the centers of motor Shaft and Flywheel.
 - Take the reading of Spring Scale at a point where Idler is apart from Motor Shaft and Flywheel simultaneously.
- Pressure of Idler shall normally be:
 $100 \sim 200g$

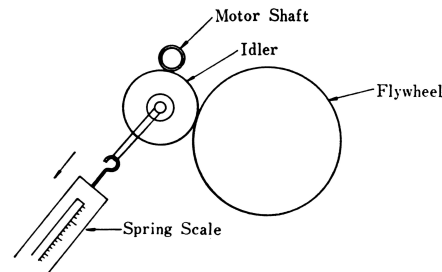


Fig. 14

ADJUSTMENT

Adjust Idler Spring (Fig. 15)

- If pressure is too weak cut shors the spring for 1~2 turns.
- If pressure is too strong, stretch the spring throughout the length.

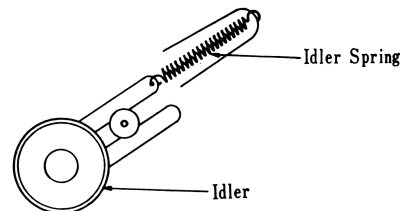


Fig. 15

REWIND REEL TABLE

- Set the unit in Rewind mode.
 - Attach a thread. to the tip of Rewind Reel Holder Lever.
 - Hook Spring Scale to the thread and pull Rewind Reel Holder Lever in the perpendicular direction from the lever.
 - Take the recording of Spring Scale at the point where Rewind Reel Table and Motor Shaft are apart.
- Pressure of Rewind Reel Holder shall normally be:
 $30 \sim 120g$

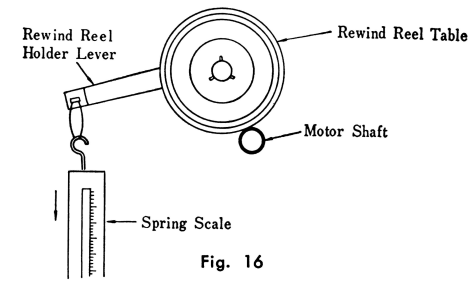


Fig. 16

ADJUSTMENT (Fig. 17)

- Adjust Rewind Rod Spring
- If the pressure is too weak, spread the spring a little.
- If too strong, cut 3~4 turns at the spring.

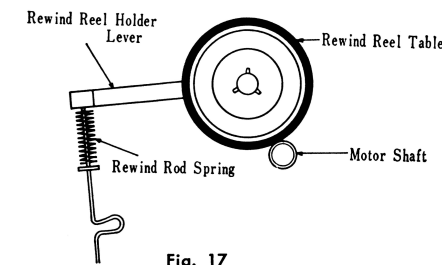


Fig. 17

TAPE PAD

- Set the unit in Playback or Record mode.
 - Press Tension Gauge on the center of tape pad.
 - Separate lightly Tape Pad from Head.
 - Read the gauge when Tape Pad are released.
- Pressure at the point of pin at the center of pad shall be:
 $20 \sim 50g$

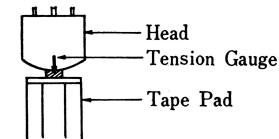


Fig. 18

ADJUSTMENT (Fig. 19)

- Adjust Tape pad Spring.
- If the pressure is too weak, spread the spring a little.
- If too strong, cut 3~4 turns at the spring.

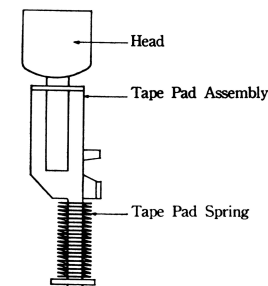


Fig. 19

AMPLIFIER MEASURING METHOD

BIAS FREQUENCY ADJUSTMENT (Fig. 20)

As shown in figure insert a 100 ohm resistor to ground lead wire of Record/Playback Head and connect vertical axis of Oscilloscope across resistor, connect horizontal axis of Oscilloscope to output terminal of AF Oscillator.

When RQ-300S is set to RECORD mode, connected as above, lissajous figure will appear on the Oscilloscope; refer to this figure, to check frequency bias Oscillator. Standard frequency is $35 KC \pm 5 KC$.

If frequency is not within above range, adjust dust core of E-6 (Bias Oscillator Coil) until above frequency is obtained.

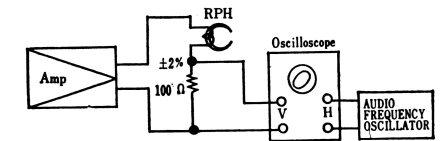


Fig. 20

BIAS CURRENT ADJUSTMENT (Fig. 21)

As shown in figure insert 100 ohm resistor to ground lead wire of Record/Playback Head and connect VTVM across resistor. When recorder is set to RECORD mode with volume control set minimum, BIAS (to be fed to Record/Playback Head) will be indicated at VTVM.

As standard bias current for model RQ300S is set at 0.8 ± 0.05 mA, VTVM reading should be 80 mV ($100 \text{ ohm} \times 0.8 \text{ mA}$).

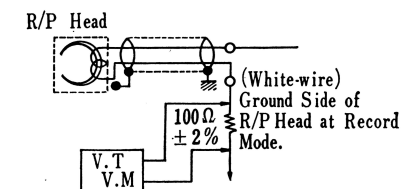
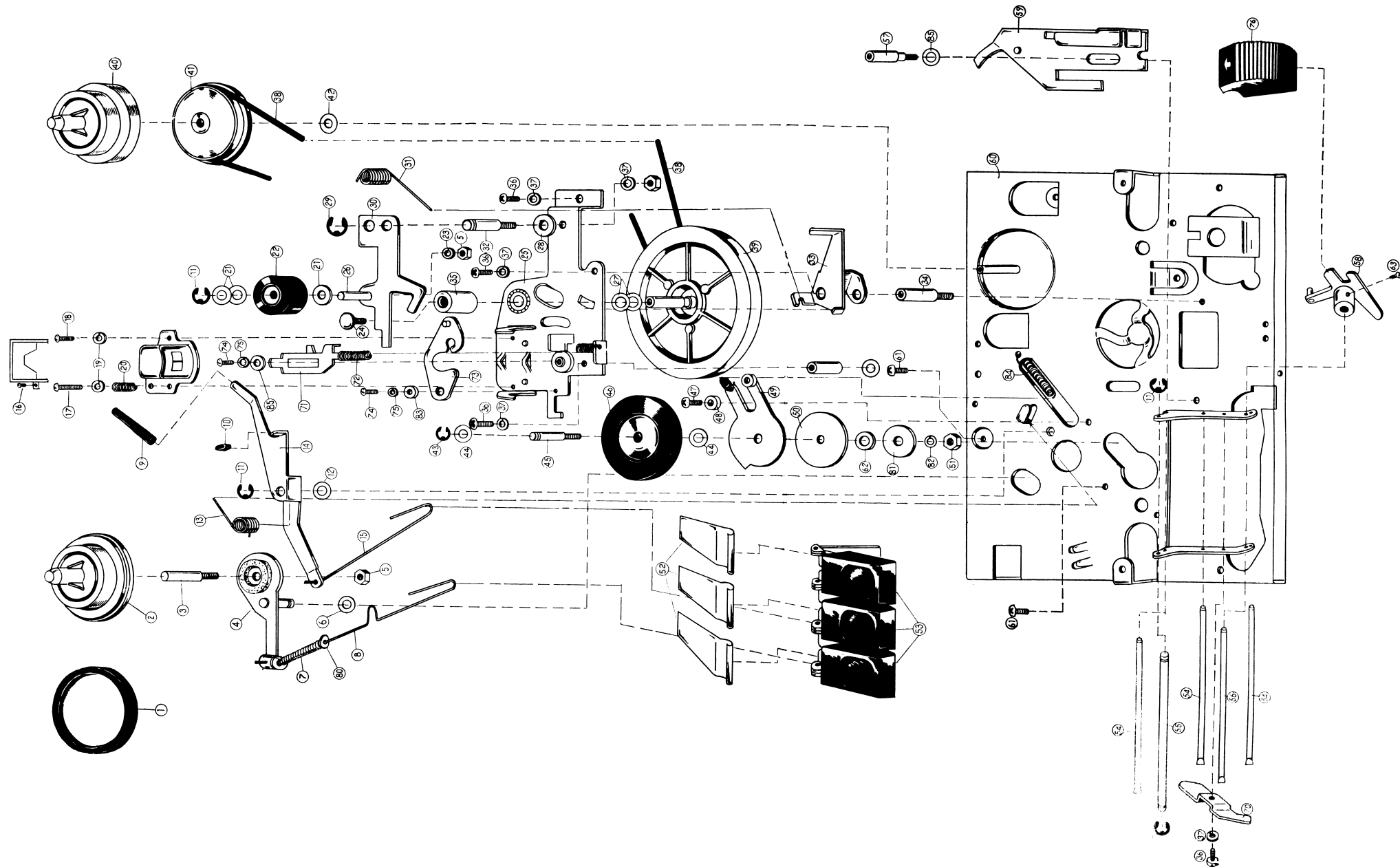
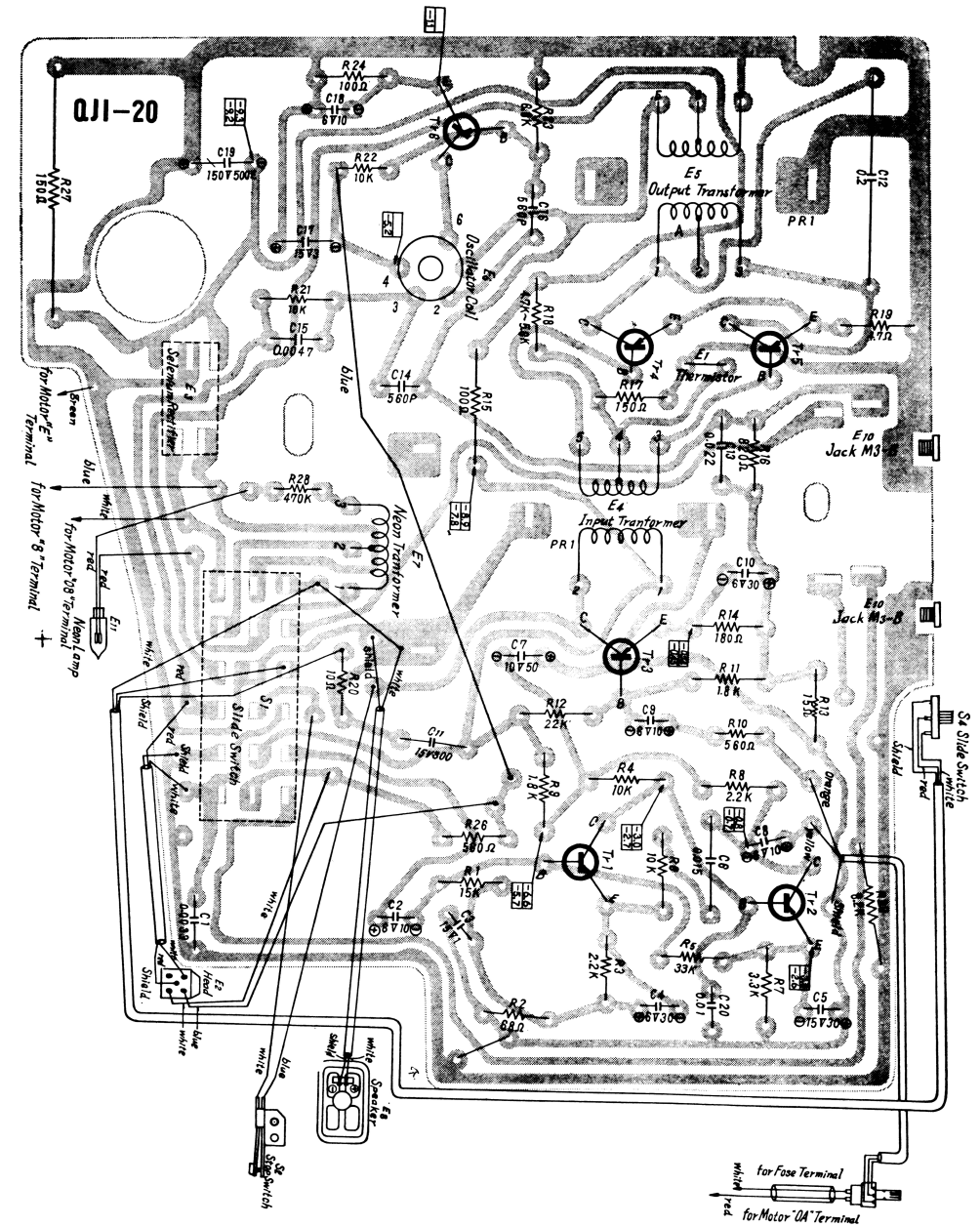


Fig. 21

ERASE CURRENT

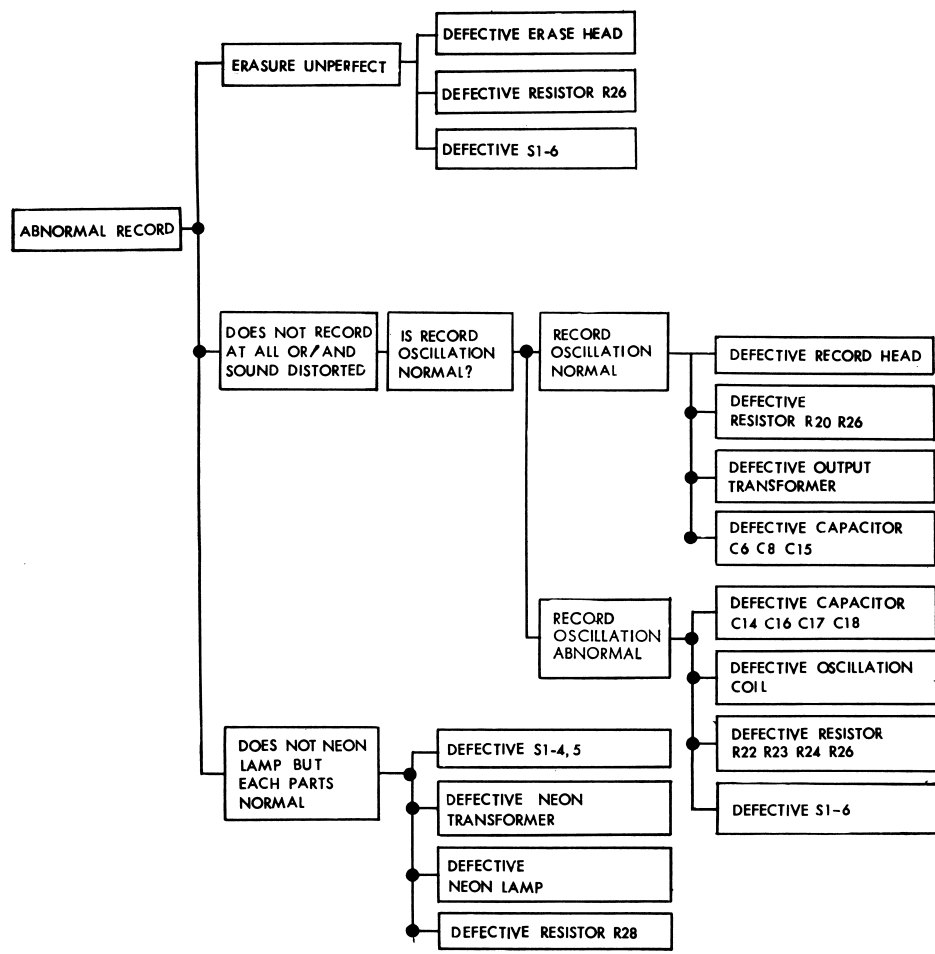
Normally, 7 ± 2 mA DC will flow through the erase head. When replcing the erase head, observe polarity.





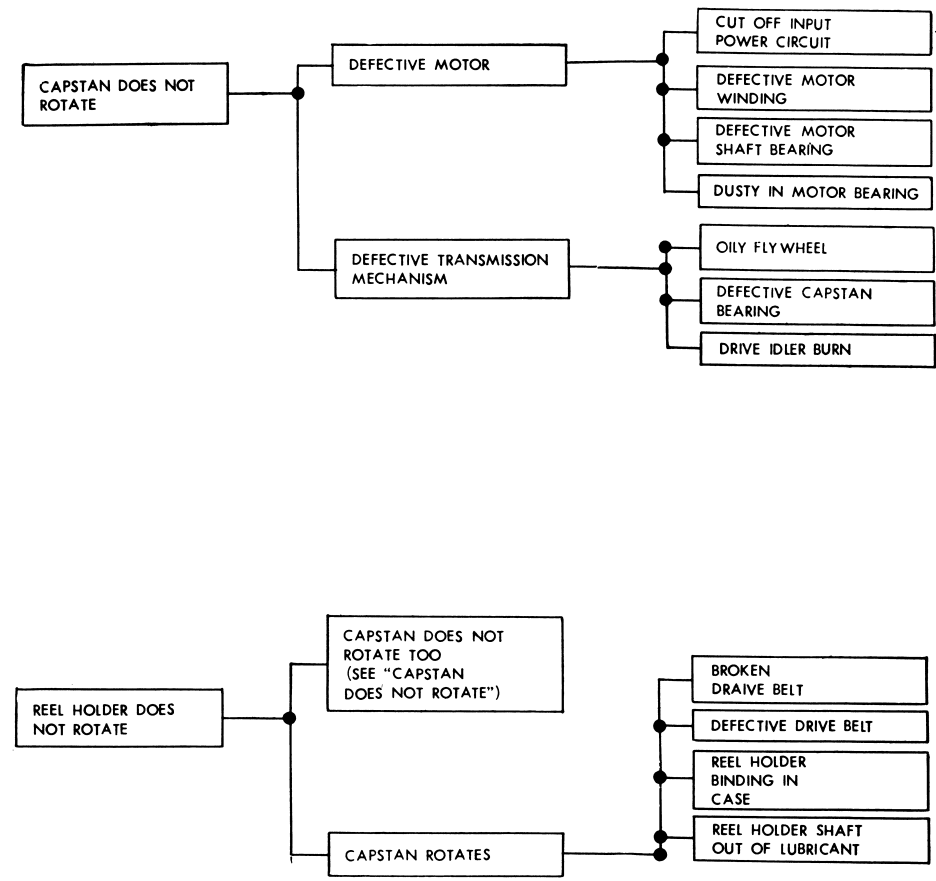
TRUBLE SHOOTING GUIDE 2

DEFECTIVE RECORDING CIRCUIT

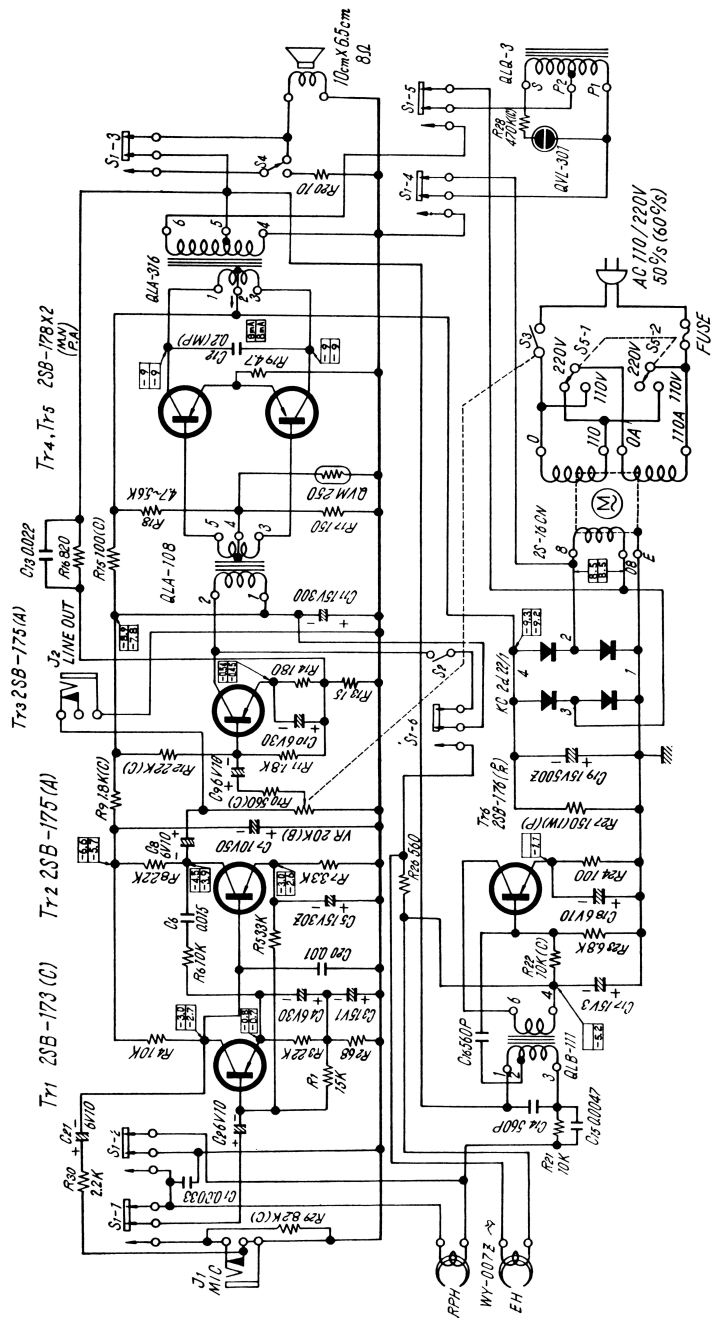


TRUBLE SHOOTING GUIDE 3

DEFECTIVE MECHINISM



SCHEMATIC DIAGRAM RQ-300SE



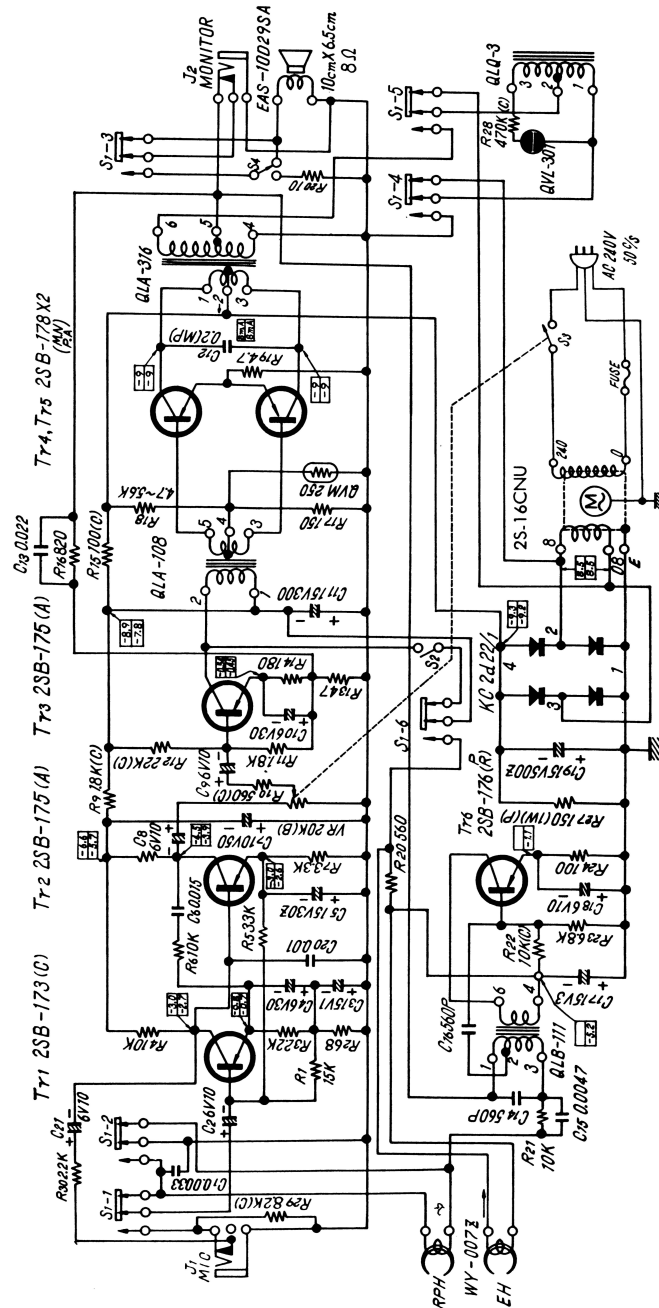
NOTE:

1. S₁-1~S₁-6: Record/Playback Selector Switch (Shown in Play Position)
2. S₁: Stop Switch
3. S₁: Power ON/OFF Switch (coupled with VR)
4. 4: Monitor Switch
5. S₁: Voltage Selector Switch
6. All resistance in Ω . K=1,000 Ω

7. All resistance in $\frac{1}{4}$ wattage. But Ω = $\frac{1}{2}$ or $\frac{1}{4}$ Wattage
7. All Capacitance in Microfarads. P=Micro-microfarads
8. Values indicated in \square are D.C. to chassis ground with no signal applied.

The upper valves should be measured during playback and the lower values during recording

SCHEMATIC DIAGRAM RQ-300S (3 Pin Plug)



NOTE:

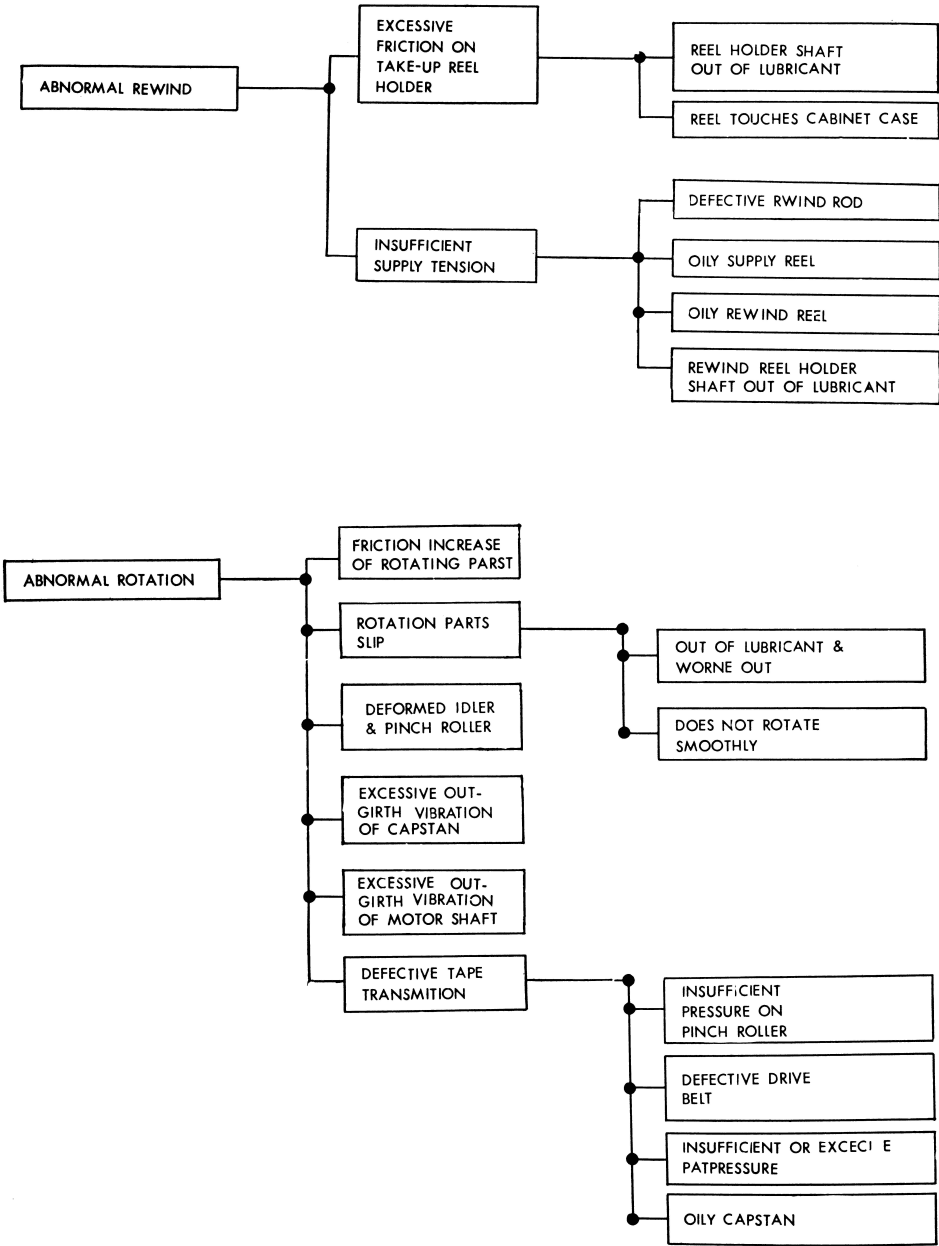
1. S₁-1~S₁-6: Record/Playback Selector Switch (Shown in Play Position)
2. S₁: Stop Switch
3. S₁: Power ON/OFF Switch (coupled with VR)
4. 4: Monitor Switch
5. All resistance in Ω . K=1,000 Ω

6. All resistance in $\frac{1}{4}$ wattage. But Ω = $\frac{1}{2}$ or $\frac{1}{4}$ Wattage
6. All Capacitance in Microfarads. P=Micro-microfarads
7. Values indicated in \square are D.C. to chassis ground with no signal applied.

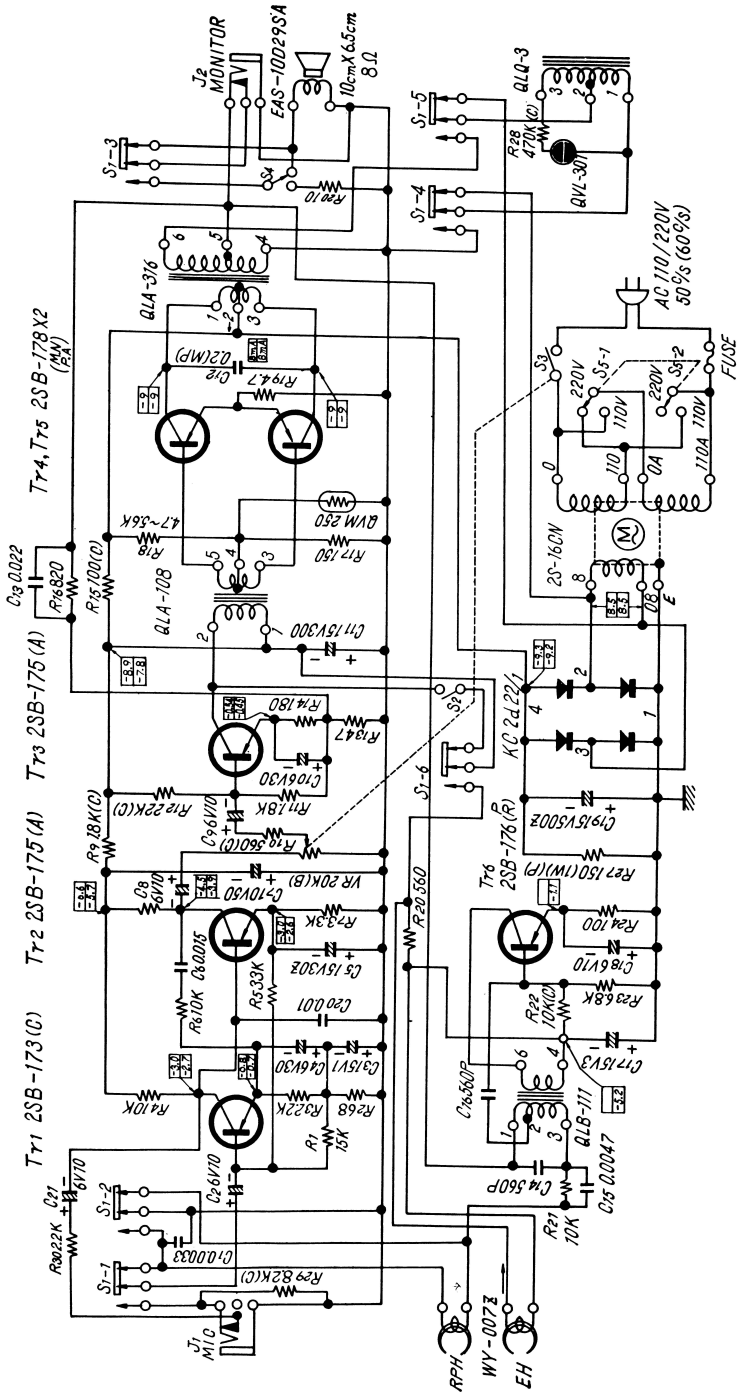
The upper valves should be measured during playback and the lower values during recording

TRUBLE SHOOTING GUIDE 4

DEFECTIVE MECHANISM



SCHEMATIC DIAGRAM RQ-300S



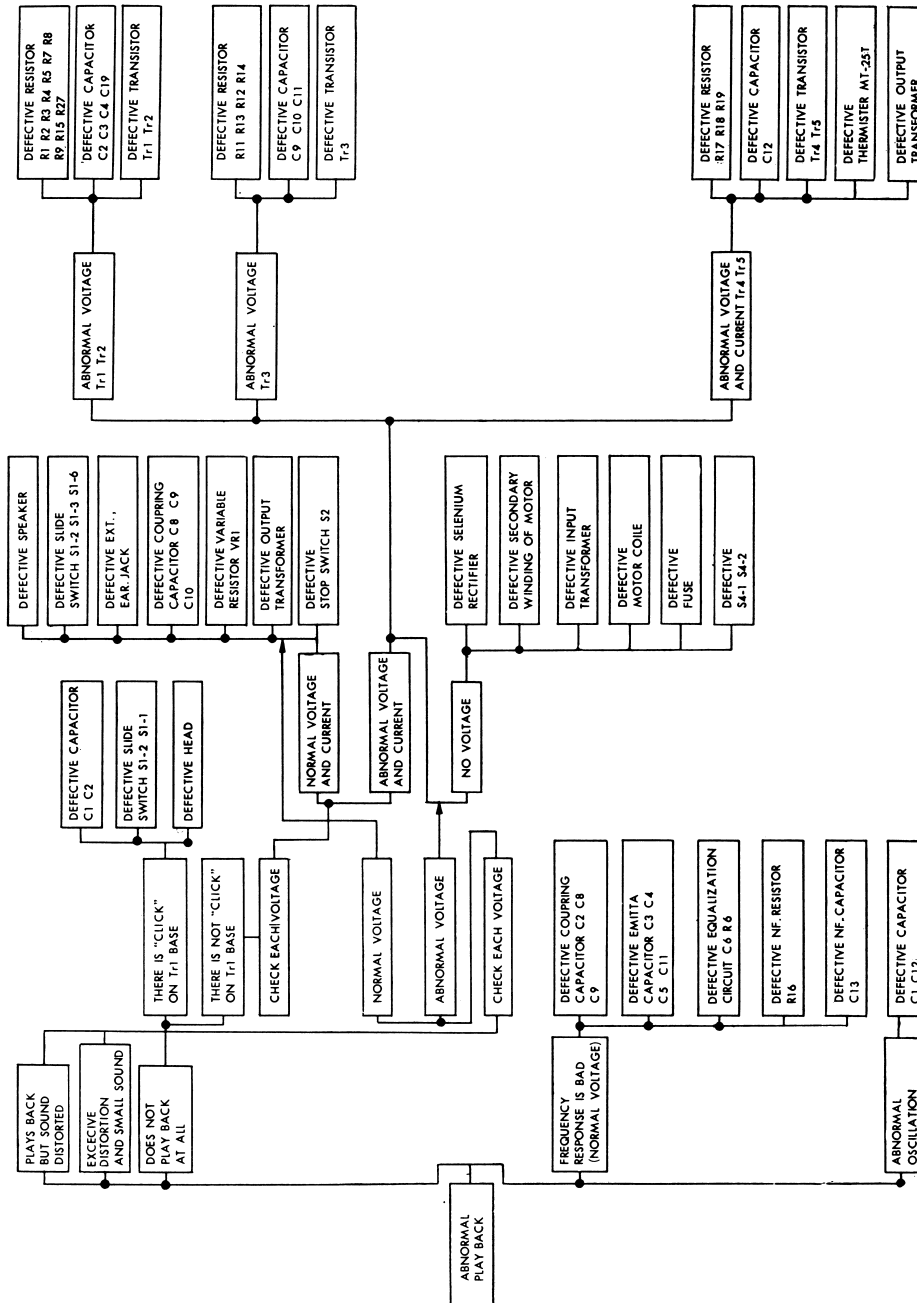
NOTE:

1. S1-1 ~ S1-5: Record/Playback Selector Switch (Shown in Play Position)
 2. S1: Stop Switch
 3. S2: Power ON/OFF Switch (coupled with VR)
 4. 4: Monitor Switch
 5. S2: Voltage Selector Switch
 6. All resistance in Ω , K=1,000 Ω
- All resistance in $\frac{1}{4}$ wattage. But (C) = $\frac{1}{2}$ or $\frac{1}{4}$ Wattage
7. All Capacitance in Microfarads. P=Micro-microfarads
8. Values indicated in \square are D.C. to chassis ground with no signal applied.
The upper values should be measured during playback and the lower values during recording

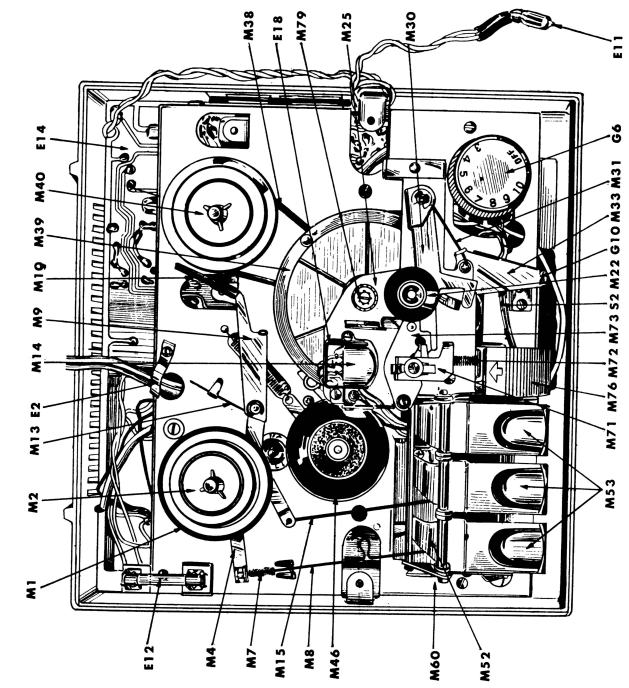
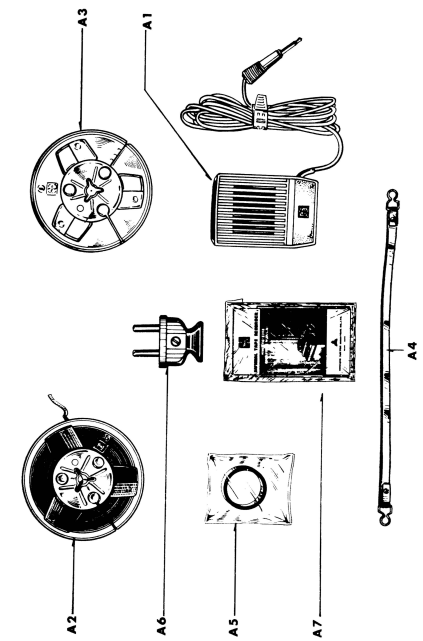
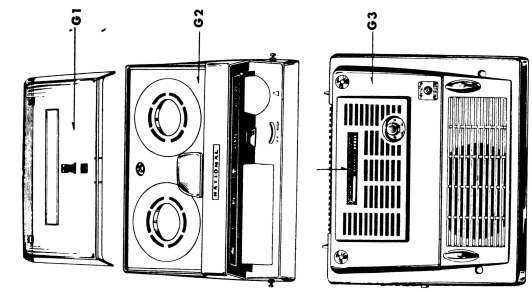
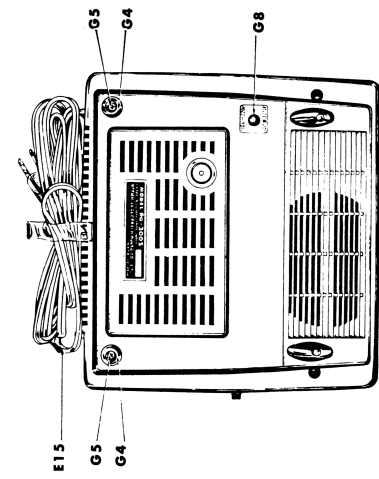
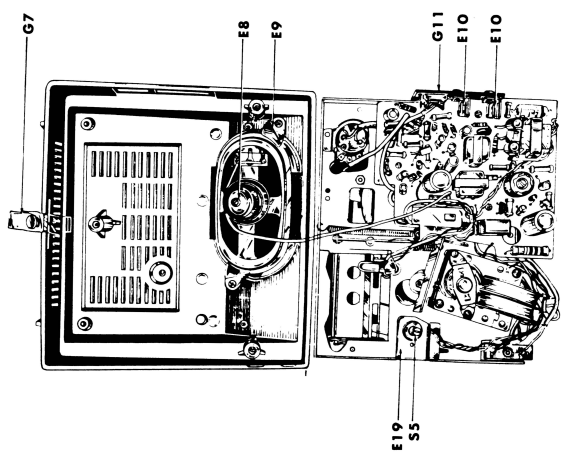
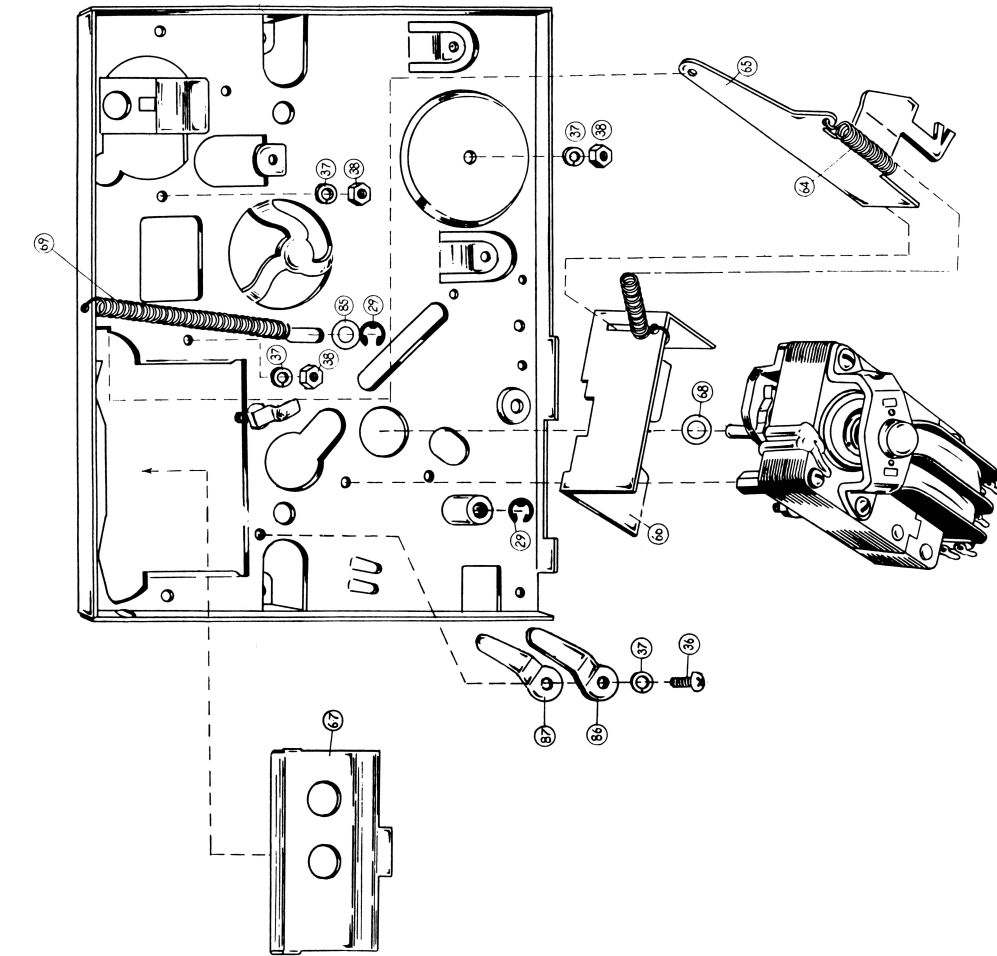
N14-7. NATIONAL MODEL RQ-300S

TROUBLE SHOOTING GUIDE 1

DEFECTIVE PLAYBACK CIRCUIT



N14-5. NATIONAL MODEL RQ-300S



N14-3. NATIONAL MODEL RQ-300S

PARTS LIST

CAPACITORS

C 1	ECQ-M05332MZ	0.0033 μ F	Mylar Capacitor
C 2	ECE-A6V10	10 μ F	Electrolytic Capacitor
C 3	ECE-A15V1	1 μ F	Electrolytic Capacitor
C 4	ECE-A6V30	30 μ F	Electrolytic Capacitor
C 5	ECE-A15V30Z	30 μ F	Electrolytic Capacitor
C 6	ECQ-M05153MZ	0.015 μ F	Mylar Capacitor
C 7	ECE-A10V50	50 μ F	Electrolytic Capacitor
C 8	ECE-A6V10	10 μ F	Electrolytic Capacitor
C 9	ECE-A6V10	10 μ F	Electrolytic Capacitor
C 10	ECE-A6V30	30 μ F	Electrolytic Capacitor
C 11	ECE-A15V300	300 μ F	Electrolytic Capacitor
C 12	ECR-R1204M	0.2 μ F	MP Capacitor
C 13	ECQ-M05223MZ	0.022 μ F	Mylar Capacitor
C 14	ECQ-S1561KZ	560 pF	Styrol Capacitor
C 15	ECQ-M05472MZ	0.0047 μ F	Mylar Capacitor
C 16	ECQ-S1561KZ	560 pF	Styrol Capacitor
C 17	ECE-A15V3	3 μ F	Electrolytic Capacitor
C 18	ECE-A6V10	10 μ F	Electrolytic Capacitor
C 19	ECE-A15V500Z	500 μ F	Electrolytic Capacitor
C 20	ECQ-M05103MZ	0.01 μ F	Mylar-capacitor
C 21	ECE-A6V10	10 μ F	Electrolytic Capacitor

SWITCH

S 1	Slide Switch (FSD-162):	Record/Playback Selector Switch
S 2	Leaf Switch (OSB0134):	Stop Switch
S 3	Power ON/OFF Switch:	Coupled with VR 1
S 4	Slide Switch (ESD 1016):	Sound Monitor Switch
S 5	Rotary Switch (ESR-E122S20AE):	Voltage Selector Switch (300S, 300SE)

ELECTRICAL

E 1	QVM-250	Thermistor
E 2	WY-007Z	Record/Play and Erasing Head
E 3	KC 2d 22/1	Selenium Rectifier
E 4	QLA-108	Input Transformer
E 5	QLA-316	Output Transformer
E 6	QLB-111	Oscillator Coil
E 7	QLQ-3	Neon Transformer
E 8	EAS-10D29SA	Speaker
E 9	2S-16CN	Motor (300S, 300SE)
	2S-16CNU	Motor (3 pin Plug)
E 10	QJA-104	Jack M3-B
E 11	QVL-301	Neon Lamp
E 12	QJF-1004	Fuse 0.3 A
E 13	QTF-1001	Fuse Holder
E 14	QJI-20	Printed Circuit Board
E 15	QFC-1001	Power Cord
E 16	QTT-1069	Heat Sink
E 17	QTH-1001	Heat Sink Cap
E 18	QTS-1013	Head Shielding Cover
E 19	QTT-1040	Voltage Selector Switch Angle
E 20	QTD-1111	Card Clamp

TRANSISTOR

Tr 1	2SB-173 (C)	Transistor
Tr 2	2SB-175 (A)	Transistor
Tr 3	2SB-175 (A)	Transistor
Tr 4	2SB-178 (M,N,P,A)	Transistor
Tr 5	2SB-178 (M,N,P,A)	Transistor
Tr 6	2SB-176 (P,R)	Transistor

RESISTORS

R 1	ERC-14BFK	15 K Ω	Solid Resistor
R 2	ERD-14LZK	68 Ω	Carbon Film Resistor
R 3	ERD-14LZK	2.2 K Ω	Carbon Film Resistor
R 4	ERD-14LZK	10 K Ω	Carbon Film Resistor
R 5	ERD-14LZK	33 K Ω	Carbon Film Resistor
R 6	ERD-14LZK	10 K Ω	Carbon Film Resistor
R 7	ERD-14LZK	3.3 K Ω	Carbon Film Resistor
R 8	ERD-14LZK	2.2 K Ω	Carbon Film Resistor
R 9	ERC-12BFM	1.8 K Ω	Solid Resistor
R 10	ERC-12BFM	560 Ω	Solid Resistor
R 11	ERC-14BFK	1.8 K Ω	Solid Resistor
R 12	ERC-12BFM	22 K Ω	Solid Resistor
R 13	ERD-14LZK	47 Ω	Carbon Film Resistor
R 14	ERC-14BFK	1.8K Ω	Solid Resistor
R 15	ERC-12BFM	100 Ω	Solid Resistor
R 16	ERC-14BFK	820 Ω	Solid Resistor
R 17	ERC-14BFK	150 Ω	Solid Resistor
R 18	ERD-14LZK	4.7 K Ω	Carbon Film Resistor
R 19	ERD-14LZK	4.7 Ω	Carbon Film Resistor
R 20	ERD-14LZK	10 Ω	Carbon Film Resistor
R 21	ERD-14LZK	10 K Ω	Carbon Film Resistor
R 22	ERC-12BFM	10 K Ω	Solid Resistor
R 23	ERD-14LZK	6.8 K Ω	Carbon Film Resistor
R 24	ERD-14LZK	100 Ω	Carbon Film Resistor
R 26	ERC-14BFK	560 Ω	Solid Resistor
R 27	ERD-1PZK	150 Ω	Carbon Film Resistor
R 28	ERC-12BFM	470 K Ω	Solid Resistor
R 29	ERC-12BFM	8.2 K Ω	Solid Resistor
R 30	ERD-14LZK	2.2 K Ω	Carbon Film Resistor
VR 1	EVC-A7CL20B24	20 K Ω B	Variable Resistor

MECHANICAL

M 1	Rewind Reel Holder Rubber Ring	
M 2	Rewind Reel Holder	(including M1)
M 3	Rewind Reel Holder Shaft	
M 4	Rewind Reel Holder Lever	
M 5	Nut	3 ϕ
M 6	Fiber for Rewind Reel Holder Lever	
M 7	Rewind Rod Spring	
M 8	Rewind Rod	
M 9	Brake Rubber (A)	
M 10	Brake Rubber (B)	
M 11	Stop Ring for Brake Lever	3.2 ϕ
M 12	Fiber Washer for Brake Lever	
M 13	Brake Lever Rod Spring	
M 14	Brake Lever	(including M9, M10)
M 15	Brake Rod	
M 16	Screw for Head-Shield Cover	2 ϕ \times 4
M 17	Screw for Head Adjustment	2 ϕ \times 12
M 18	Screw for Head	
M 19	Spring Washer	2 ϕ
M 20	Head Adjustment Spring	
M 21	Fiber Washer for Pinch Roller	
M 22	Pinch Roller	
M 23	Spring Washer	2.6 ϕ
M 24	Capstan Screw	
M 25	Upper Shassis	
M 26	Pinch Roller shaft	8 ϕ
M 27	Washer for Flywheel Bearing	
M 28	Metal for Pinch Roller Lever Shaft	
M 29	Stop Ring for Pinch Roller Lever	4 ϕ
M 30	Pinch Roller Lever	
M 31	Spring Rod for First Forward Lever	
M 32	Pinch Roller Lever Shaft	
M 33	First Forward Lever	
M 34	Shaft for First Forward Lever	
M 35	Capstan Sleeve	
M 36	Screw for Upper Shassis Holding	
M 37	Spring Washer for Upper Shassis Holding	
M 38	Rubber Belt for Takeup Drive	
M 39	Flywheel	
M 40	Takeup Reel Holder	
M 41	Takeup Reel Pulley	
M 42	Fiber Washer for Reel Pulley	
M 43	Stop Ring for Drive Idler	2.3 ϕ
M 44	Fiber Washer for Drive Idler Shaft	
M 45	Drive Idler Shaft	
M 46	Drive Idler	
M 47	Screw for Drive Idler Hook	
M 48	Drive Idler Hook	
M 49	Drive Idler Holder	
M 50	Washer (A) for Drive Idler Holder	
M 51	Nut for Drive Idler Shaft	
M 52	Push Button Spring	
M 53	Push Button	
M 54	Push Button Shaft (C)	
M 55	Push Button Shaft (A)	
M 56	Push Button Shaft (B)	
M 57	Upper Shassis Holding Shaft	
M 58	Record Button Lever	
M 59	Pinch Roller Lever Rod	
M 60	Base Plate	
M 61	Screw for Motor Holder	
M 62	Metal for Drive Idler Shaft	
M 63	Screw for Record Lever	2.6 ϕ
M 64	Record Lever Spring	
M 65	Record Lever	
M 66	Motor Shield	
M 67	Push Button Frame	
M 68	Rubber for Motor Shaft	
M 69	Push Button Lever Spring	
M 70	Push Button Frame (B)	
M 71	Sape Pad Holder	
M 72	Tape Pad Spring	
M 73	Tape Pad Table	
M 74	Screw for Tape Pad Holding	
M 75	Spring Washer for Tape Pad Holding	
M 76	Record Button	
M 77	Carrying Belt Hook	
M 78	Screw for Printed Circuit Board	
M 79	Screw for Stop Switch	
M 80	Rewind Rod Washer	
M 81	Washer (B) for Drive Idler Holding	
M 82	Spring Washer for Drive Idler Holding	
M 83	Tape Pad Holding Metal	
M 84	Drive Idler Spring	
M 85	Fiber Washer for Record Button Lever Shaft	
M 86	Stopper for Push Button Frame	
M 87	Stopper Spring	

MECHANICAL

CABINET

G 1	Cover for Cabinet Case (A)
G 2	Cabinet Case (A)
G 3	Cabinet Case (B)
G 4	Rubber Foot
G 5	Screw for Rubber Foot
G 6	Volume Control Knob
G 7	AC Cord Holder Band
G 8	AC Main Select Switch Namer
G 9	Speaker Holding Metal
G 10	Fast Forward Knob
G 11	Jack Terminal Plate

ACCESSORIES

A 1	Dynamic Microphone	WM-2048N
A 2	3" Recording Tape	
A 3	3" Empty Reel	
A 4	Carrying Belt	
A 5	Splicing Tape	
A 6	2 Pin Plug B	
A 7	Instruction Book	

PACKING

P 1	Packing Case
P 2	Inner Cussion (A)
P 3	Inner Cussion (B)
P 4	Gauze
P 5	Accessorie Case
P 6	Cord Holder

RECORD LEVEL MEASURING

- Instruments Required: Audio Frequency Oscillator, Attenuator, VTVM Resistor (100 Ω)
 - Measuring Circuit Refer Fig. 22
 - A. As shown in Fig. 22 connect output of Audio Frequency Oscillator to Microphone Input Jack of RQ-300S, through attenuator (terminate with 600 Ω it impedance of attenuator is 600 Ω). Disconnect wiring from terminal of head insert 100 Ω resistor between lead wire and connect VTVM across resistor.
 - B. In order to cut off bias current from oscillator coil "1" and "3", short the circuit.
 - C. Standard recording level is set at the level that the Neon Lamp, remember should blink at the record head current of 0.05 mA with 1 KC -70db~-76db tone input, adjust the attenuator.
- The record head current is measured in the following setup, and attenuator reading of 3 in-db indicates the standard recording level.

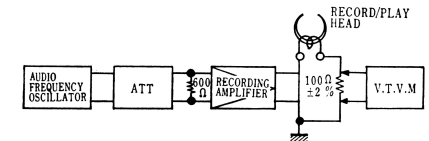


Fig. 22

N14-1. NATIONAL MODEL RQ-300S

DISASSEMBLY INSTRUCTION

To Remove Case Body (Fig. 4)

- Pull up and remove case-cover.
- Remove 2 screws, holding Case Body.
- Remove Neon Level Indicator from Case Body (Mechanical part can be inspected and adjusted in this condition)

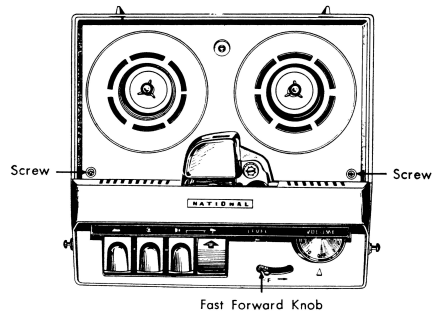


Fig. 4

To REMOVE Bottom Cover Case (Fig. 5)

- Remove 2 screws, holding mechanism and one screw, holding AC cord. Take out mechanism from cover case.
- In this condition, motor and electric circuit be inspected and adjusted.
- Reel-table will come off if the unit is turned upside down.

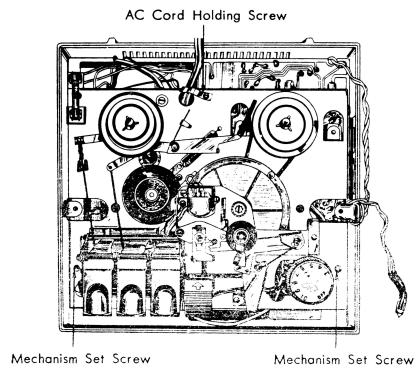


Fig. 5

To Remove Drive Belt (Fig. 6)

- Remove 2 screws from upper-Shassis.
- Pull up and remove upper-Shassis from flywheel and reel-pulley.

To Remove Motor (Fig. 6)

- Remove pin and washer, holding idler.
- Lift Upper-Shassis and remove idler.
- Remove soldered lead-wires from motor- terminals.
- Remove motor after removing holding screws.
- When replacing motor, Reinstall it in the reverse sequence.

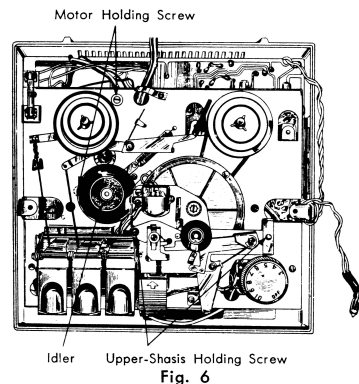


Fig. 6

To Remove Head (Record/Playback & Erase) (Fig. 7)

- Remove head-shield plate, by removing holding screw
- Remove 5 lead wires from head.
- Remove head after removing 2 head-adjusting screws.

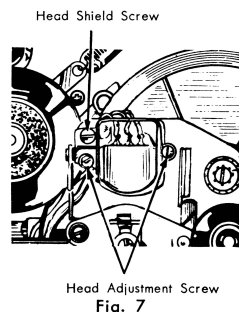


Fig. 7

To Remove Printed Circuit Board (Fig. 8)

- Remove 3 screws holding Printed Circuit Board.
- Take out Printed Circuit Board from Baseplate.

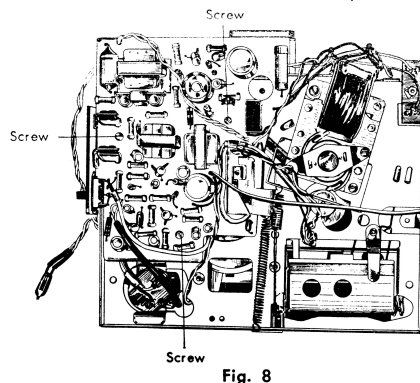


Fig. 8

HEAD ADJUSTMENT

- In Model RQ-300S, one head functions as a combined Record/Playback/Erase head.
- Set tape in travelling condition and pull down head-pad forward.
- Adjust the height of head so that relative position of head-core and tape is as shown below.

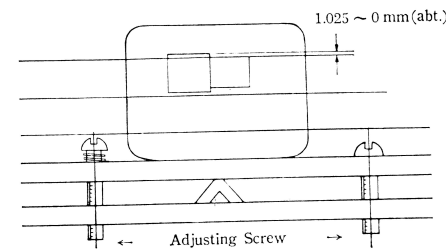


Fig. 9

- Playback the signal (for 3,500 % at 3-3/4 ips) recorded on the standard alignment tape and determine the maximum output point by adjusting screws.
- If no standard alignment tape is available use a tape with signals properly recorded on a reliable tape recorder, and find out the maximum playback output point by hearing. (After adjustment the screws shall be lacquer-looked.)

Adjustment of Slide-Switch (Fig. 11)

- Set mechanism in Record mode.
- Adjust the position of print circuit board so that the position of slide-switch knob is moved about 0.2 mm-0.4 mm forward playback side from its position when fully pushed to Record mode.
- In this case clearance between the side of the knob and switch-lever.
- After securing print circuit board in position, set mechanism in playback mode.
- In this condition, slide-knob shall be ascertained to be fully pushed to Playback side.
- Whenever printed circuit board is removed and reinstalled, the slide-switch must be adjusted.

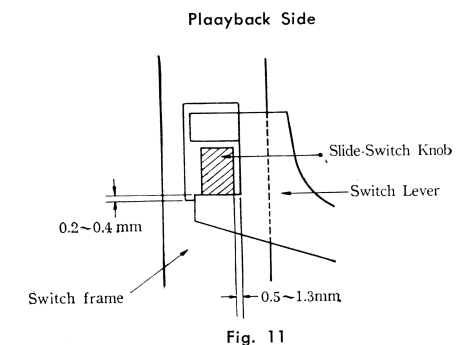


Fig. 11

AMPLIFIER ADJUSTMENTS

Adjustment of the Stroke of Stop-Switch (Fig. 10)

- Set mechanism in playback mode.
- Contact point shall be OFF and clearance, 0.8 mm-1.6 mm then.
- Then set it in Stop mode from Playback.
- Adjust screw of stop-switch so that contact point will close and its stroke be 4 mm-5 mm in this condition

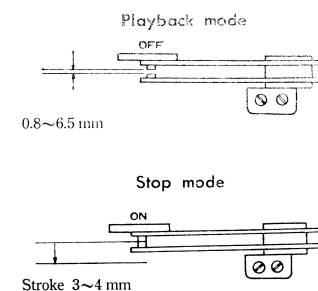


Fig. 10