

Fig. 5

#### STOP (Refer to Figure 6)

When the Operating Lever is turned to the STOP position, the Brake is pressed against both Reel Holders. Simultaneously, the Pinch Roller disengages the Capstan and the Motor Pulley disengages the Flywheel.

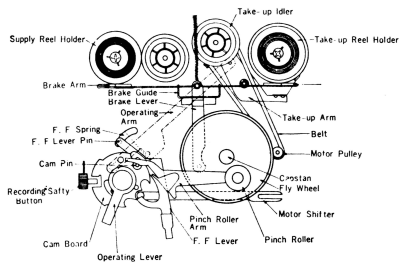


Fig. 6

### MECHANICAL ADJUSTMENTS

#### INSTRUMENTS REQUIRED

Spring Scale 50g, 150g, 300g, 500g and 3kg.

#### PINCH ROLLER TENSION

Measurement (Refer to Figure 7)

Do not load Tape-reel.  
Attach a string to the Pinch-roller.  
Hook Spring Scale (3Kg) on Pinch-roller.  
Set the unit in Playback or Record mode and turn unit ON.  
Pull Pressure-roller in the direction of a straight line from the centers of the Capstan and the Pinch-roller.  
Observe the reading of the Spring Scale at the point where the Pressure-roller ceases to rotate.

Pressure of Pinch-roller shall normally be:  
320-420g 3-3/4 ips (9.5 cm/sec)  
or  
300-340g 1-7/8 ips (4.75 cm/sec)

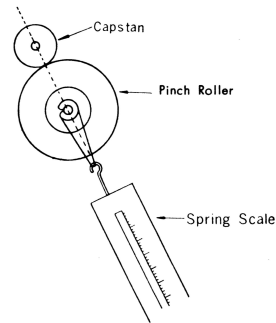


Fig. 7

#### ADJUSTMENT (Refer to Figure 8)

Adjust Pinch-roller Spring.  
If spring tension is too weak cut the spring 1-2 turns shorter.  
If spring tension is too strong stretch the spring throughout the length.

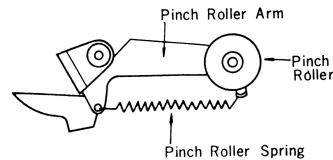


Fig. 8

#### MOTOR PULLEY TENSION (Refer to Figure 9)

##### Measurement

Set the unit in Playback mode with Power Switch turned OFF. Fashion a loop from a suitable string and attach around Motor pulley. Hook Spring Scale (500g) on the string and pull Motor away. Take reading of the Scale at the point where the Motor pulley disengages the Flywheel.  
Pressure of Motor pulley shall normally be 600-700g.

##### Adjustment

Adjust Motor-spring.  
If tension is too weak, cut the spring 1-2 turns shorter.  
If tension is too strong, stretch the spring throughout the length.

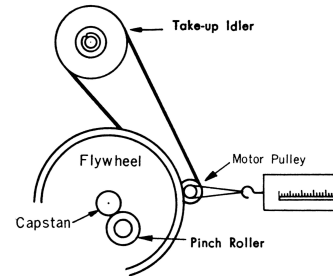


Fig. 9

#### TAKE-UP IDLER TENSION (Refer to Figure 10)

##### Measurement

Set the unit in Playback mode with Switch turned OFF. Fashion a loop from a suitable string and attach around Take-up Idler.  
Hook Spring Scale (500g) on the string and pull it in the direction of a straight line from the centers of the Take-up Reel Holder and the Take-up Idler.  
Take reading of the Scale at the point where Take-up Idler comes off Take-up Reel Holder.  
Normal pressure of Take-up Idler shall be 150g.

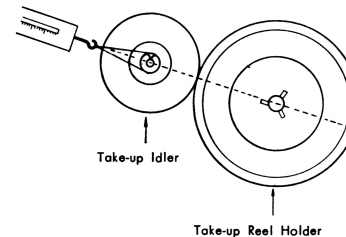


Fig. 10

#### REWIND IDLER

Set the unit in STOP mode with Power Switch turned OFF. Measure in a manner similar to the Take-up Idler measurement. Normal pressure of Rewind Idler shall be 180-120g.

#### WINDING TORQUE FOR PLAYBACK

Measurement (Refer to Figure 11)

Form a loop at the end of a 5-inch reel of tape with adhesive tape and place the Reel on Take-up Reel Holder as shown.  
Hook Tension Gauge, 50g, on the loop at the end of the Tape.  
Set the unit in Playback or Record mode.  
Allow the Take-up Reel to pull Tension Gauge.

Read the gauge when it ceases to swing. (Repeat several times)  
Normal torque shall be 3-8 for a 5-inch reel of tape, fully wound.

#### ADJUSTMENT (Refer to Figure 12)

Adjust Tension Spring.  
If tension is insufficient, cut the Spring one or two coils shorter. If too strong, stretch the whole length of the spring.

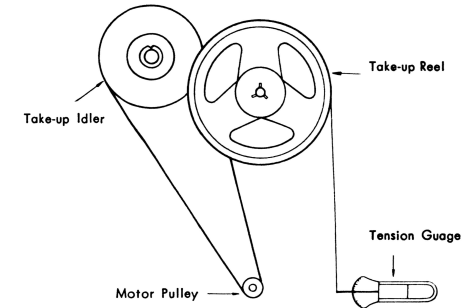


Fig. 11

#### WINDING TORQUE FOR FAST FORWARD

##### Measurement

Place the unit in the Fast Forward mode and measure in a manner similar to Playback.  
Normal Winding Torque in Fast Forward mode shall be over 40g for a 5-inch reel of tape, fully wound.

#### WINDING TORQUE FOR REWIND

##### Measurement

Place the unit in the Rewind mode and measure in a manner similar to Playback.  
Normal torque shall be over 40g for a 5-inch reel of tape, fully wound.

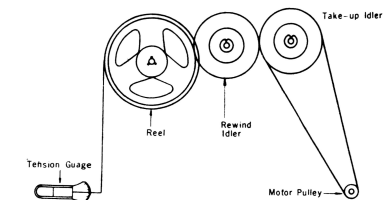


Fig. 12

## Transistor 25B-324

1. Remove Transistor heat sink.
2. Remove 2 screws of Shielded-plate.
3. Unsolder 2 transistors.

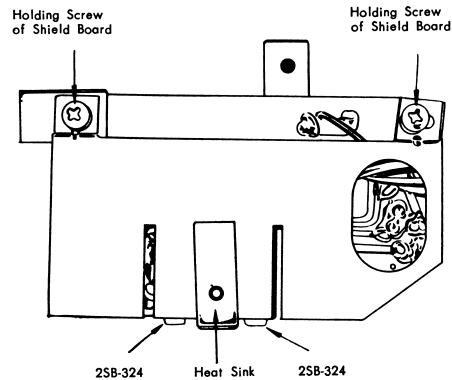


Fig. 16

## Belt

1. Move Operating Lever to STOP position.
2. Remove Belt from Motor-pulley.
3. Remove Belt by turning Take-up idler.

## Brake

1. Remove Brake-spring.
2. Loosen screw of Supply-reel holder, and remove Reel-holder.
3. Loosen screw of take-up holder, and remove Reel-holder.
4. Move operating Lever to STOP position.

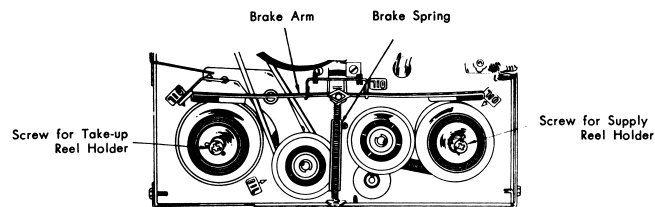


Fig. 17

## ADJUSTMENT OF RADIO PARTS

### MW Alignment (Fig. 17)

#### Equipment

- Signal Generator (Covering 455KC~1500KC)
- Radiation loop coil (Make up a 10 turn, 15 cm diameter bobbin, using 0.5 mm or more copper wire.)
- Output meter (Circuit Tester or Vacuum-tube volt meter.)
- Monitor speaker (Voice coil imp. 8Ω)

#### Alignment Procedure

- SIGNAL GENERATOR.....Moderate Signal Generator at 400 c/s and 30%.
- OUTPUT LEVEL .....Attenuate Signal Generator output always to maintain 1 volt on Output Meter to prevent overloading of the receiver.
- RADIO RECEIVER.....Place the radio receiver 60 cm (24") away from Radiation loop coil.
- Set volume control to maximum.
- Tone control to "HIGH."

#### If RF Alignment

Step	Connection of Signal Generator	Signal Generator Frequency	Radio Dial Setting	Connection of Output Meter	Points to be Aligned	Remarks
1	Fashion loop of Several turns of wire and radiate signal into loop of receiver. (Fig. 1)	455KC	Point of non-interference.	Across Monitor speaker voice coil	T <sub>1</sub> , T <sub>2</sub> , T <sub>3</sub>	Adjust for maximum output.
2	"	600KC	600KC	"	L <sub>1</sub> , L <sub>2</sub>	"
3	"	1500KC	1500KC	"	CT <sub>1</sub> , CT <sub>2</sub>	"
4	"	600KC & 1500KC	600KC & 1500KC	"	L <sub>1</sub> , L <sub>2</sub> CT <sub>1</sub> , CT <sub>2</sub>	Repeat steps (2) and (3)

Connection of Signal Generator, Dummy Antenna and Radio Receiver.

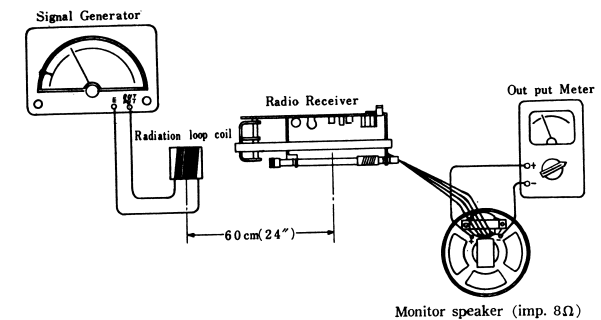


Fig. 18

CR 1 CR21MJ182 Couplates  $0.01\mu\text{F } 1.8\text{K}\Omega \pm 5\%$   
 CR 2 CR22PJ821 "  $0.02\mu\text{F } 820\Omega$  "  
 CR 3 CR22PK103 "  $0.02\mu\text{F } 10\text{K}\Omega \pm 10\%$   
 CR 4 CR22PK182 "  $0.02\mu\text{F } 1.8\text{K}\Omega$  "  
 VC 1-2 PVC-2J Variable Tuning Capacitor  
 CT 1-2 2212C Trimmer  $3\text{PF} \sim 15\text{PF}$ .  
 VR 1 NV-24C1L30 Volume Control  $20\text{K}\Omega\text{B}$   
 VR 2 SNV24C1L38 Recording Level Control  
 $20\text{K}\Omega\text{BSF}$   
 VR 3 NV16FB Level Meter Control  $3\text{K}\Omega\text{B}$   
 VR 4 NV16FB Biasing Control  $500\Omega\text{B}$

**Transistor**

Tr 1 2SB-173A  
 Tr 2 2SB-175A  
 Tr 3 2SB-175A  
 Tr 4 2SB-175A  
 Tr 5 2SB-324  
 Tr 6 2SB-324  
 Tr 7 2SA-102BA  
 Tr 8 2SA-101B  
 Tr 9 2SA-101A  
 Tr 10 2SB-175A  
 Tr 11 2SB-175A  
 Tr 12 2SB-172A

E 1 Record/Playback Head WY-002Z  
 E 2 Erasing Head WY-203Z  
 E 3 Recording Level and Tuning Meter  
 E 4 RQ-530E Printed Circuit Board  
 E 5 RQ-530D Printed Circuit Board  
 E 6 RQ-530C Printed Circuit Board  
 E 7 Pilot Lamp  
 E 8 Pilot Lamp Socket  
 E 9 Ferrite Rod Antenna  
 E 10 Motor 2L-17D  
 E 11 Speaker D-650S

S 1 Slide Switch TR-6D  
 S 2 Stop Switch  
 S 3 Radio/Tape Selector Switch  
 S 4 Motor Switch S6 Motor Switch  
 S 7 AC Main Selector Switch

L 1 MW Antenna Coil AMI016-EE-1  
 L 2 MW Oscillator Coil AOP2-AN  
 L 3 Oscillator Coil ICO-8  
 L 4 Hum Bucking Coil

T 1 MI-W 1 1 st IF Transformer  
 T 2 MI-W2 2 nd IF Transformer  
 T 3 MI-W4D 3rd IF Transformer  
 T 4 IT-1002R Input Transformer  
 T 5 OT-3005R Output Transformer  
 T 6 OT-3006R Output Transformer  
 T 7 PT-2034R Power Transformer

Silicon Diode MP-01  
 Thermistor MT-8T

D 1 OA-70  
 D 2 OA-70  
 S P D-650S Speaker  
 M 1 Rewind Idler (C) washer  
 M 2 Fiber Washer for rewind Idler  
 M 3 Brake Felt  
 M 4 Take-up Idler  
 M 5 Rewind Idler  
 M 6 Rubber Belt  
 M 7 Screw for Reel Holder  
 M 8 Take-up Reel Holder  
 M 9 Take-up Reel Holder Pulley  
 M 10 Supply Reel Holder  
 M 11 Brake Rubber  
 M 12 Brake Guide  
 M 13 Head Base  
 M 14 Pinch Roller (C) Washer  
 M 15 Rubber Ring for Idler  
 M 16 Sub Base-Plate  
 M 17 Take-up Guide Arm  
 M 18 Take-up Guide (C) Washer  
 M 19 Setting Plate (C) Washer  
 M 20 Setting Plate for Rewind Idler  
 M 21 Rewind Idler Spring  
 M 22 Brake Arm Spring  
 M 23 Brake Guide Holder  
 M 24 Rubber Ring for Take-up Idler  
 M 25 Flywheel  
 M 26 Fast Forward Lever  
 M 27 Fast Forward Lever Spring  
 M 28 Cam Plate  
 M 29 Fast Forward Knob  
 M 30 Take-up Rod  
 M 31 Operation Arm Spring  
 M 32 Operation Lever  
 M 33 Brake Arm  
 M 34 Take-up Rod Spring  
 M 35 50 c/s Sleeve  
 M 36 Stop Switch Plate  
 M 37 Holder Plate for Printed Circuit Board  
 M 38 Motor Pulley  
 M 39 Dial Guide Holding Metal  
 M 40 Pointer  
 M 41 Pointer Guide  
 M 42 Tuning Shaft  
 M 43 Antenna Spacer  
 M 44 Motor Mounting Board  
 M 45 Tape Guide (Left)  
 M 46 Tape Pad Arm Assembly  
 M 47 Drum  
 M 48 Head Adjustment Plate  
 M 49 Dial Spring  
 M 50 Roller (P)  
 M 51 AC Selector Switch Mounting Board  
 M 52 Pinch Roller

M 53 Pinch Roller Lever  
 M 54 Motor Mounting Board Rubber Cushion  
 M 55 Mounting Screw for above  
 M 56 Pinch Roller Spring  
 M 57 Capstan Screw  
 M 58 Capstan Sleeve (3.3/4 ips)  
 M 59 Capstan Rest  
 M 60 Tape Guide (Right)  
 M 61 Antenna Spacer (B)  
 G 1 Cabinet Case (A)  
 G 2 Cabinet Case (B)  
 G 3 Cabinet Case (C)  
 G 4 Head Cover  
 G 5 Operation Knob  
 G 6 Volume Control & Recording Level Knob  
 G 7 Tuning Knob  
 G 8 Volume Control Knob  
 G 9 Rubber Foot  
 G 10 Carrying Handle  
 G 11 Screw for Rubber Foot  
 G 12 Screw for Carrying Handle  
 G 13 Record Button

### Printed Circuit Board (D)

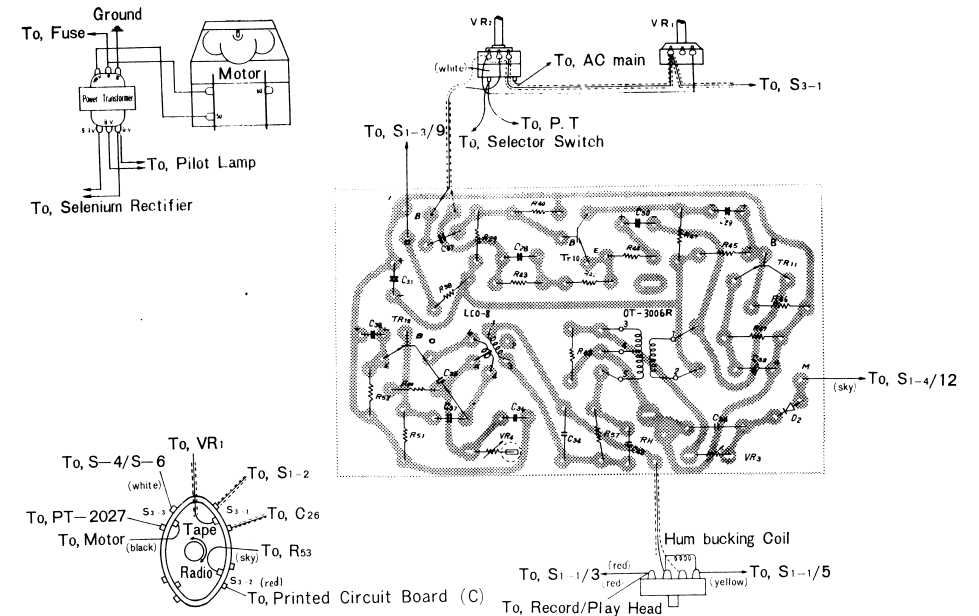


Fig. 27

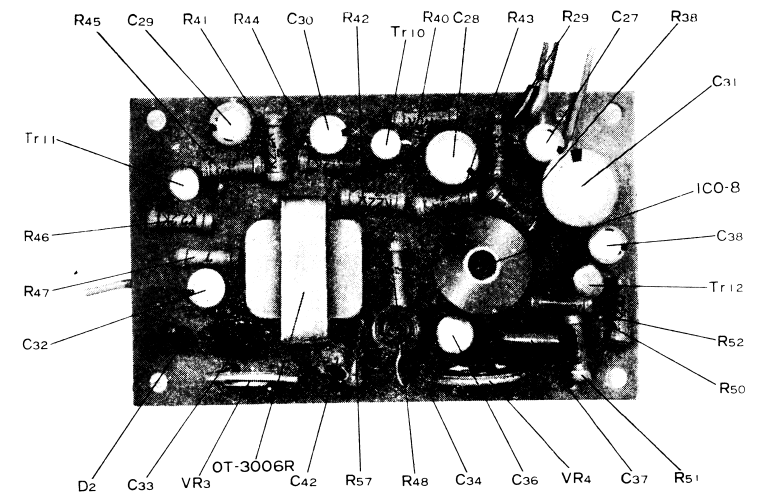
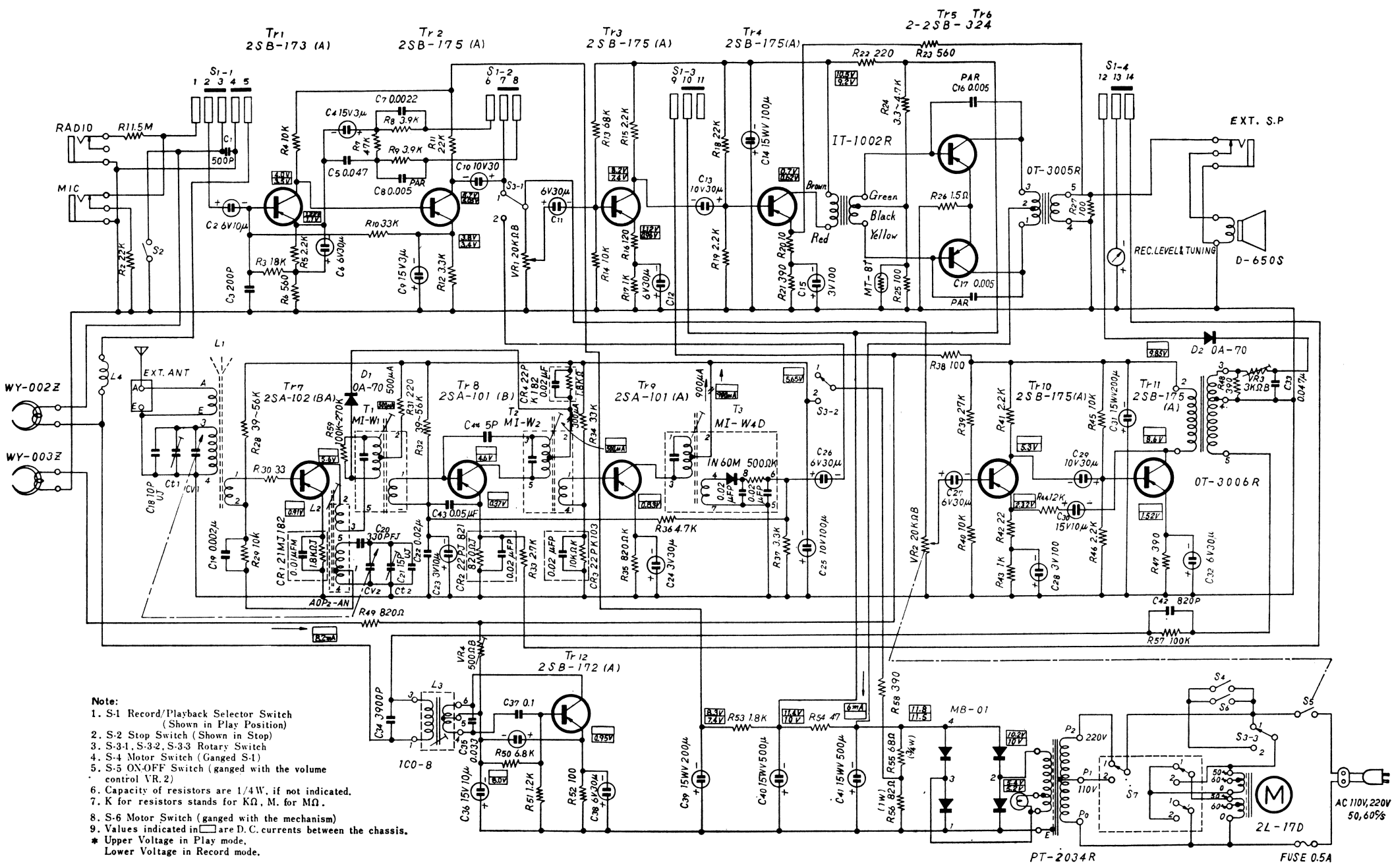


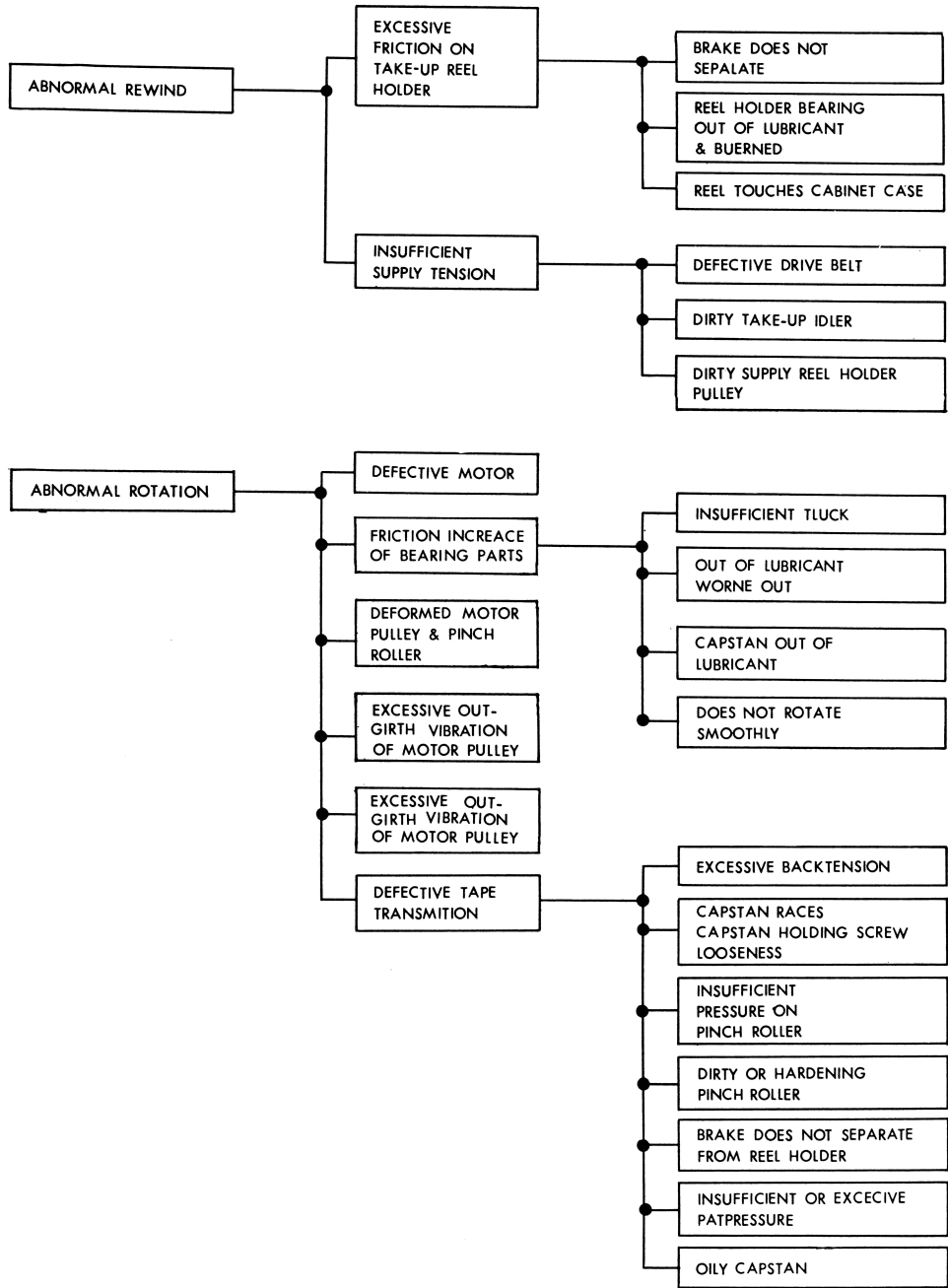
Fig. 28



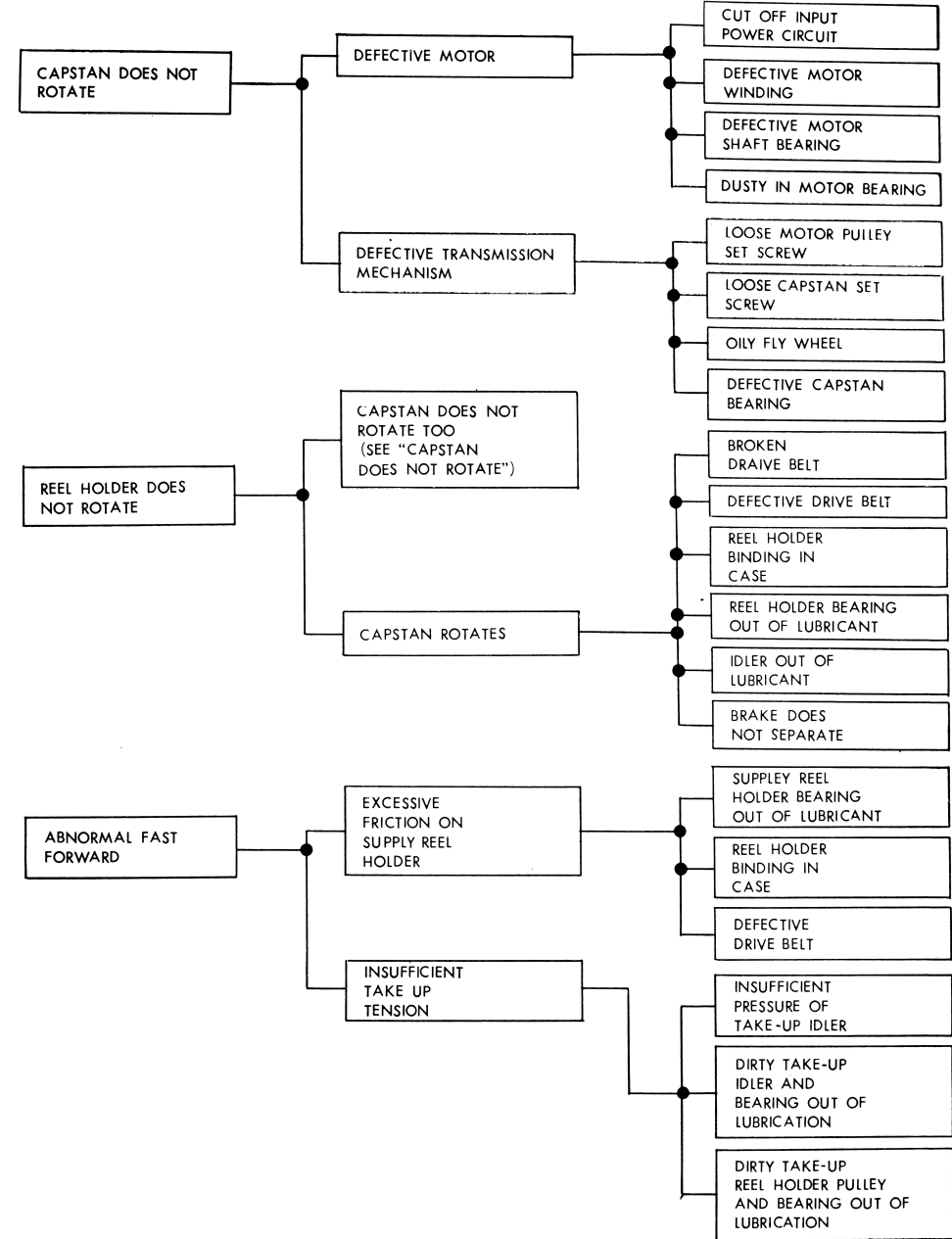




TROUBLE SHOOTING GUIDE 3



TROUBLE SHOOTING GUIDE 4



N20-8.

# NATIONAL MODEL RQ-530

## Printed Circuit Board (E)

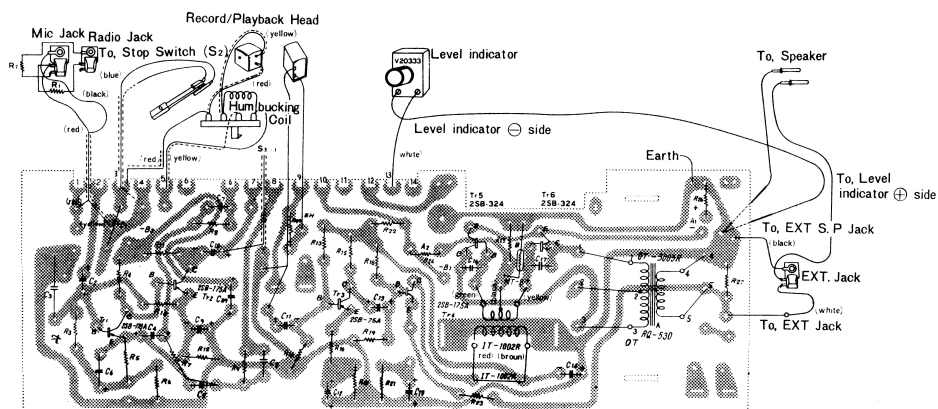


Fig. 29

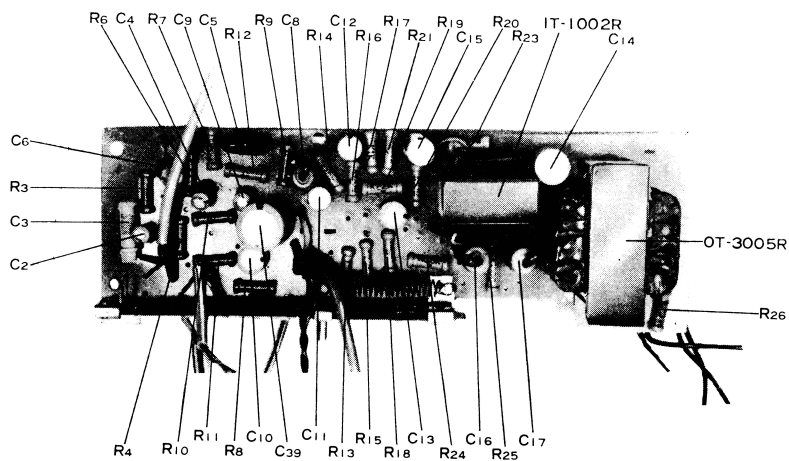


Fig. 30

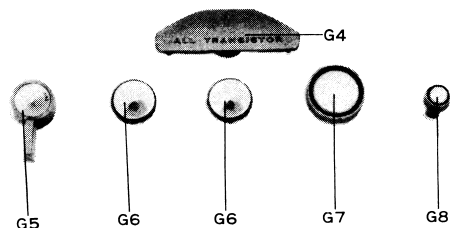
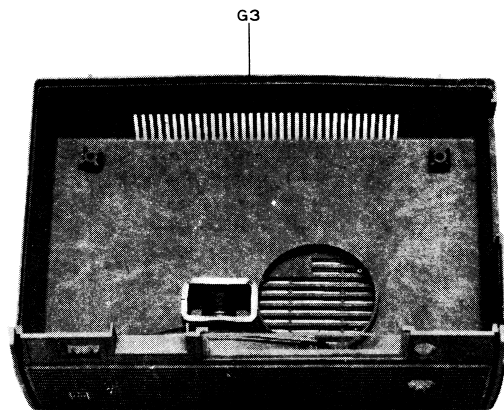


Fig. 21

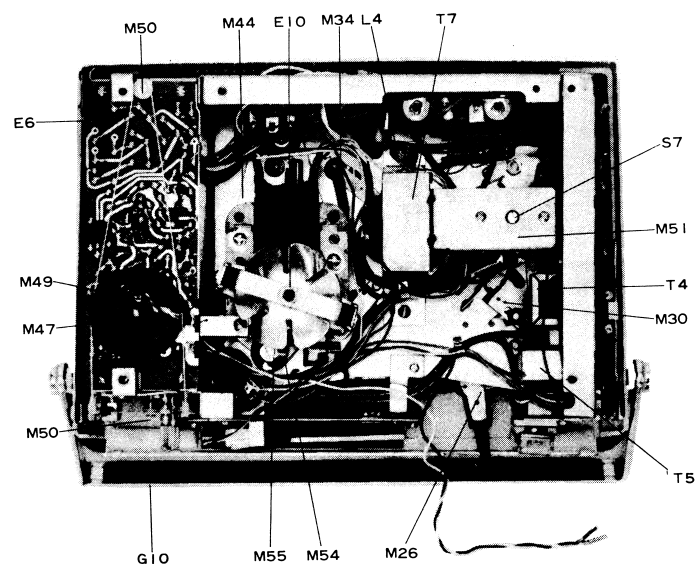


Fig. 22

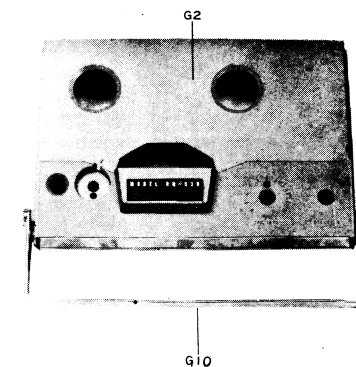
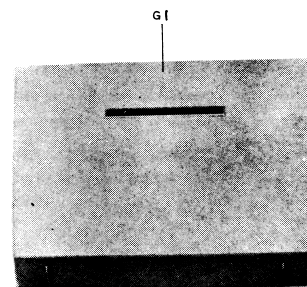


Fig. 23

NOTE: Replacement Parts No. Refer to P 10-11

1 - M10	10 - M48	19 - M13	28 - M62	37 - M15	46 - M17	55 - M38	64 - M59
2 - M 7	11 - G10	20 - E 8	29 - M40	38 - M20	47 - M 6	56 - S 6	65 - M28
3 - M 3	12 - G 6	21 - M39	30 - M32	39 - M19	48 - M 7	57 - M50	66 - M26
4 - M11	13 - M31	22 - M27	31 - M41	40 - M22	49 - M 8	58 - VR1	
5 - M12	14 - E 3	23 - M53	32 - VR 2	41 - M23	50 - M48	59 - M 5	
6 - S 2	15 - M46	24 - M57	33 - M42	42 - M24	51 - E 9	60 - M 9	
7 - E 1	16 - M29	25 - M58	34 - M21	43 - M 1	52 - M33	61 - M18	
8 - E 2	17 - M56	26 - M14	35 - M 1	44 - M 4	53 - M52	62 - M36	
9 - M45	18 - E 7	27 - M52	36 - M 2	45 - M 2	54 - M35	63 - M37	

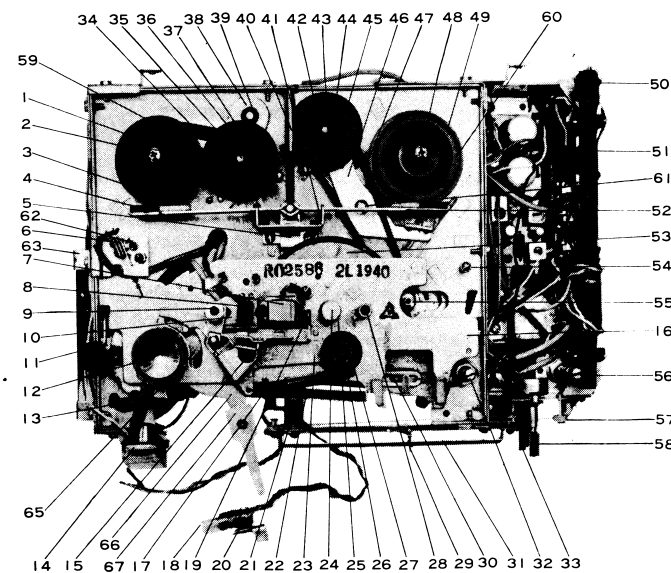


Fig. 24

If loop coil is not ready available, refer to the illustration below.

Wind enamel wire 0.5 mm dia on a bobbin about 15 cm dia for about 10 rounds. This is a solenoid coil. Bobbin may be paper-board, fiber pressboard and other insulating material. (Fig. 18)

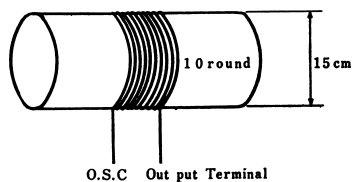


Fig. 19

## Dial Cord Stringing

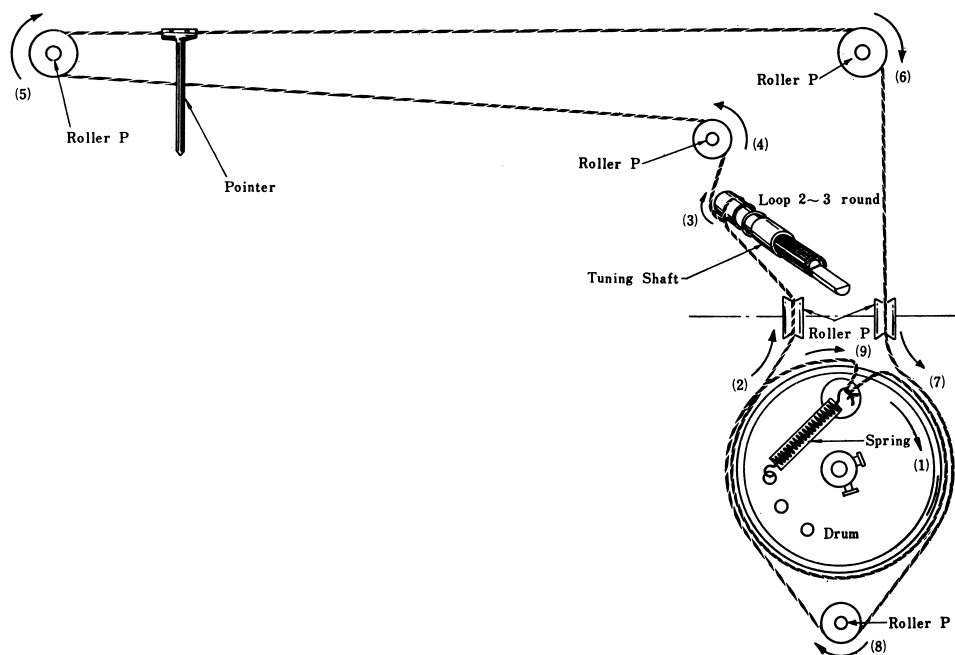


Fig. 20

## REPLACEMENT PARTS

## Resistors

R 1	RD1/4LZK	1.5M $\Omega$	Carbon $\pm 10\%$
R 2	"	22K $\Omega$	" "
R 3	"	18K $\Omega$	" "
R 4	"	10K $\Omega$	" "
R 5	"	2.2K $\Omega$	" "
R 6	"	560 $\Omega$	" "
R 7	"	47K $\Omega$	" "
R 8	"	3.9K $\Omega$	" "
R 9	"	3.9K $\Omega$	" "
R 10	"	33K $\Omega$	" "
R 11	"	22K $\Omega$	" "
R 12	"	3.3K $\Omega$	" "
R 13	"	68K $\Omega$	" "
R 14	"	10K $\Omega$	" "
R 15	"	2.2K $\Omega$	" "
R 16	"	120 $\Omega$	" "
R 17	"	1K $\Omega$	" "
R 18	"	22K $\Omega$	" "
R 19	"	2.2K $\Omega$	" "
R 20	"	10 $\Omega$	" "
R 21	"	390 $\Omega$	" "
R 22	"	220 $\Omega$	" "
R 23	"	560 $\Omega$	" "
R 24	"	3.9K $\Omega$	" "
R 25	"	100 $\Omega$	" "
R 26	WR1/2L	1.5k $\Omega$	Wire Wound Resistor $\pm 10\%$
R 27	RD1/4LZK	100 $\Omega$	Carbon $\pm 10\%$
R 28	"	47K $\Omega$	" "
R 29	"	10K $\Omega$	" "
R 30	"	33 $\Omega$	" "
R 31	"	220 $\Omega$	" "
R 32	"	47K $\Omega$	" "
R 33	"	2.7K $\Omega$	" "
R 34	"	33K $\Omega$	" "
R 35	"	820 $\Omega$	" "
R 36	"	4.7K $\Omega$	" "
R 37	"	3.3K $\Omega$	" "
R 38	"	100 $\Omega$	" "
R 39	"	27K $\Omega$	" "
R 40	"	10K $\Omega$	" "
R 41	"	2.2K $\Omega$	" "
R 42	"	22 $\Omega$	" "
R 43	"	1K $\Omega$	" "
R 44	"	12K $\Omega$	" "
R 45	"	10K $\Omega$	" "
R 46	"	2.2K $\Omega$	" "
R 47	"	390 $\Omega$	" "
R 48	"	390 $\Omega$	" "
R 49	"	820 $\Omega$	" "
R 50	"	6.8K $\Omega$	" "

R 51	"	1.2K $\Omega$	" "
R 52	"	100 $\Omega$	" "
R 53	"	1.8K $\Omega$	" "
R 54	"	47 $\Omega$	" "
R 55	RD3/4LZK	68 $\Omega$	" "
R 56	RD1/LZK	62 $\Omega$	" "
R 57	RD1/4LZK	100K $\Omega$	Carbon
R 58	"	390 $\Omega$	" "

## Capacitor

C 1	Stycon	500P $\mu$ F $\pm 10\%$
C 2	NCA-6V10	Electrolytic 10 $\mu$ F WV6V
C 3	Titanium	200PF $\pm 10\%$
C 4	NCA-15V3	Electrolytic 3 $\mu$ F WV15V
C 5	MNTZ05473M	Mylar 0.047 $\mu$ F WV50V
C 6	NCA-6V30	Electrolytic 30 $\mu$ F WV6V
C 7	MNTZ05222M	Mylar 0.0022 $\mu$ F WV50V
C 8	PAR4502M	Tubular 0.005 $\mu$ F
C 9	NCA-15V3	Electrolytic 3 $\mu$ F WV15V
C 10	NCA-10V30	Electrolytic 30 $\mu$ F WV10V
C 11	NCA-6V30	Electrolytic 30 $\mu$ F WV6V
C 12	NCA-6V30	Electrolytic 30 $\mu$ F WV6V
C 13	NCA-10V30	Electrolytic 30 $\mu$ F WV10V
C 14	NCA-15V100	Electrolytic 100 $\mu$ F WV15V
C 15	NCA-3A100	Electrolytic 100 $\mu$ F WV3V
C 16	PAR-4103M	Tubular 0.005 $\mu$ F
C 17	"	"
C 18	D-05100K-UJ	Titanium 10PF 5%
C 19	D-05202M-Y	Titanium 0.002 $\mu$ F
C 20	SHDZ-02331J	Stycon 330P $\mu$ F $\pm 5\%$
C 21	D-05150K-UJ	Titanium 15PF 5%
C 22	D-10203P	Titanium 0.02 $\mu$ F
C 23	NCA-3V10	Electrolytic 10 $\mu$ F WV3V
C 24	NCA-3V30	Electrolytic 30 $\mu$ F WV3V
C 25	NCA-10V100	Electrolytic 100 $\mu$ F WV10V
C 26	NCA-6V30	Electrolytic 30 $\mu$ F WV6V
C 27	NCA-6V30	Electrolytic 30 $\mu$ F WV6V
C 28	NCA-3V100	Electrolytic 100 $\mu$ F WV3V
C 29	NCA-10V30	Electrolytic 30 $\mu$ F WV10V
C 30	NCA-15V10	Electrolytic 10 $\mu$ F WV15V
C 31	NCA-15V200	Electrolytic 200 $\mu$ F WV15V
C 32	NCA-6V30	Electrolytic 30 $\mu$ F WV6V
C 33	MNTZ05473M	Mylar 0.047 $\mu$ F WV50V
C 34	SHDZ-1392K	Stycon 3900P $\mu$ F $\pm 10\%$
C 35	MNTZ0533M	Mylar 0.033 $\mu$ F WV50V
C 36	NCA-15V10	Electrolytic 10 $\mu$ F WV15V
C 37	MNTZ05104M	Mylar 0.1 $\mu$ F WV50V
C 38	NCA-6V30	Electrolytic 30 $\mu$ F WV6V
C 39	NCA-15V200	Electrolytic 200 $\mu$ F WV15V
C 40	NCA-15V500	Electrolytic 500 $\mu$ F WV15V
C 41	NCA-15V500	Electrolytic 500 $\mu$ F WV15V
C 42	SHDX-02821K	Stycon 820P $\mu$ F $\pm 10\%$
C 43	D-05503Z	Titanium 0.05 $\mu$ F
C 44	D-10203P	Titanium 5PF $\pm 1P\mu$
C 45	NCA-15V3	Electrolytic 3 $\mu$ F WV15V

**TAPE PADS PRESSURE** (Refer to Figure 13)**Measurement**

Set the unit in Playback mode.  
Press Tension Gauge on the center of tape pads.  
Lightly separate Tape Pads from Head.  
Read the gauge when Tape Pads are released.  
Normal pressure at the point of the pin at the center of pads shall be 30-40g.

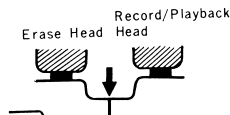


Fig. 13

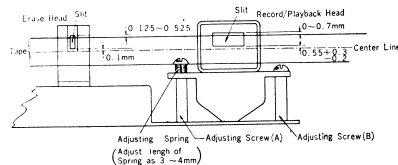
**HEAD ADJUSTMENTS**

Fig. 14

**ERASE HEAD** (Refer to Figure 14)**To Adjust Erase Head Height**

1. Thread the recorder with tape.
2. Turn the opening lever in the Playback position and pull back Tape-pads.
3. Adjust the relative position of Head-core and tape as shown in illustration.
4. If the position of Head-core is too low, raise by means of spacers.

**RECORD/PLAYBACK HEAD** (Refer to Figure 14)**To Adjust Record/Playback Head Height**

Repeat Steps 1, 2, 3 as stated above.  
Level the Head on its base by adjusting the relative position of Head to the tape as shown above. Use standard alignment tape (with recording of 7000 c/s) and playback the signal on the tape. Find the maximum output point by adjusting screws (A) and (B).

When standard alignment tape is not available, properly record signal with a reliable Tape-recorder and play it back.

Adjust screws (A) and (B) for maximum playback output.

**AMPLIFIER ADJUSTMENTS****STOP SWITCH**

Install a switch so that the secondary side of the output transformer is short-circuited, in order to prevent the generation of noise from amplifier through the speaker when switching to STOP, F.F. and Rewind.

**BIAS OSCILLATOR FREQUENCY**

Adjust the core adjusting screw of the oscillator coil so that the oscillator frequency of the recording bias and erasing high frequency oscillator circuit is at  $33\text{ KC} \pm 5\text{ KC}$ . Connect a 10 ohm resistor in series with the ground side of the erase head and measure the frequency of the voltage across the resistor with an oscilloscope. Compare with the frequency of a standard oscillator (Lissajous wave-form to be observed on the oscilloscope).

**BIAS CURRENT**

Proper bias is necessary for optimum recording. Adjust the bias oscillator frequency as described above. Connect a 100 ohm resistor in series with the ground side of the Record/Playback head and measure the voltage across the resistor. Adjust with the trimmer condenser. Proper AC bias: 0.6 mA (voltage at both sides of 100 ohm resistor:  $0.6 \times 10^3 \times 100 = 0.06\text{V}$ )

**ERASE CURRENT**

Should the erase current be incorrect, imperfect erasure or over-heating of the Erase Head may occur. Connect a D.C. ammeter in series with the ground side (black) of Erase Head and measure the current. Normally the proper erase current is 8 to 12 mA. If necessary, adjust current by replacing Resistor R49 (820 ohm) which is connected in series to Erase Head.

**RECORDING LEVEL**

Unless recording level is adjusted properly, the output of the playback may be lowered or the sound may be distorted. Adjust the level as follows if it is improper:

First, stop the bias oscillator by either short-circuiting the base of Oscillator Transistor 2SB-173 to ground or between the secondary side of Oscillator Transformer and ground. Then adjust variable control VR3 5K ohm so that the signal current to Record Head shows 0.07 mA when measured by a D.C. ammeter. The Level Meter should show zero.

**MAINTENANCE****LUBRICATION & CLEANING**

This tape recorder does not, as a rule, require oiling, however, it is preferable to oil once a year or when parts are repaired, as follows:

Capstan Bearing	1—2 drops Oil
Pinch Roller Bearing	1—2 drops Oil
Rewind Pulley Bearing	1—2 drops Oil
Motor Bearing	1 drop Oil
Reel Spindles	1—2 drops Oil

**RECORD/PLAYBACK HEAD & ERASE HEAD**

When Heads get dirty, it is important to wipe off dirt using a soft cloth moistened with alcohol. As Heads are constantly brushed by tape they gradually wear out. After many hours of use, their characteristics may deteriorate somewhat.

It is desirable to replace Heads after about 1000 hours of use.

**MOTOR**

The motor also has to be oiled...once every 500 hours. Use a good quality spindle oil or machine oil.

**IDLER**

Clean the surface of Idler in contact with the belt with alcohol.

Also, clean the surface of Idler in contact with the Reel-holders.

Oil the central shaft of Idler 1 to 2 drops once every 200 hours.

Use a good quality spindle or sewing machine oil.

**PRESSURE-ROLLER**

Clean the surface of the Pressure-Roller in contact with the Capstan with alcohol. Oil the central shaft of Pressure-Roller 1 to 2 drops once every 200 hours. Use a good quality spindle or sewing machine oil.

**CAPSTAN**

Clean the surface of Idler with alcohol. Oil the root of Capstan 1 to 2 drops once every 200 hours. Use spindle or sewing machine oil. Any remaining oil or grease on the surface of Capstan in contact with Pressure-Roller might cause the tape to slip and deteriorate the Pressure-Roller. AVOID EXCESSIVE OILING.

**DISASSEMBLY****BOTTOM COVER CASE**

1. Turn over the tape recorder so that the bottom faces up.
2. Remove 4 metal screws.
3. Remove bottom cover.

**TOP COVER CASE**

To check and clean mechanical parts and amplifier. Remove Top Cover Case as follows:

1. Remove Head Cover by pulling straight up.
2. Pull off Power Switch/Volume Control Knob.
3. Remove Operating Knob set screw.
4. Remove 5 screws on the top and sides of Top Cover Case.
5. Carefully pull Top Cover Case upward.

**OTHER PARTS****Motor**

1. Remove Belt from Motor-pulley.
2. Unsolder lead wires from Terminal Board of Motor.
3. Remove Motor Spring.
4. Remove 2 screws on Motor-holding plate.
5. Move Operating Lever to PLAY position.
6. Remove Motor together with Motor-holding plate.
7. Remove Motor from Motor-holding plate.

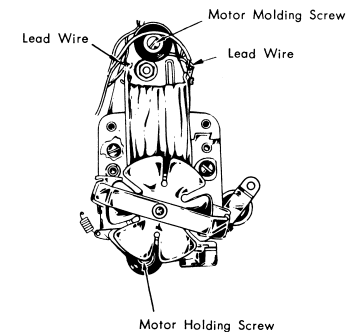


Fig. 15

# N20. NATIONAL MODEL RQ-530

## SPECIFICATIONS

<b>Power Source:</b>	Setting Voltage	Local Voltage	High Impedance: 1.5M ohm for recording from radio & phono.
	110V	100V,117V,120V	
<b>Power Consumption:</b>	220V	200V,230V,240V	<b>Output Impedance:</b> 8 ohm for external speaker.
	About 20W		
<b>Output:</b>	1W (max, 1.5W)		<b>Radio Frequency Range:</b> 535KC-1605KC.
<b>Transistors:</b>	2SB-173 (1), 2SB-175 (5),		<b>Built-in Speaker:</b> 6"×3" dynamic speaker.
	2SB-324 (2), 2SB-172 (1),		<b>Dimensions:</b> 11.4"(w)×8.3"(d)×5.1"(h)
	2SA-101 (2), 2SA-102 (1)		<b>Weight:</b> about 10 lbs. (4.7 kg)
<b>Recording System:</b>	AC Bias 33KC		
<b>Tape Speed:</b>	3.3/4 ips.(9.5 cm/sec) and		
	1.7/8 ips.(4.75 cm/sec)		
<b>Frequency Response:</b>	70-7000 c/s at 3.3/4 ips.		
	70-4000 c/s at 1.7/8 ips.		
<b>Track System:</b>	2 Track system.		
<b>Playing Time:</b>	1 hour at 3.3/4 ips. with 5"(600 ft) tape.		
	2 hours at 1.7/8 ips. with 5"(600 ft) tape.		
<b>Wow and Flutter:</b>	3.3/4 ips.---less than 0.4%		
<b>Input Impedance:</b>	Low Impedance: 20K ohm for recording from dynamic-microphone (unbalanced)		

### Accessories

Dynamic microphone WM-2003	..... 1
5" 600 ft Recording tape	..... 1
5" Empty Reel	..... 1
Recording patch cord	..... 1
Earth Cord	..... 1
Antenna Cord	..... 1
Splicing Tape	..... 1
Accessories Storage Case	..... 1

## CONTROLS

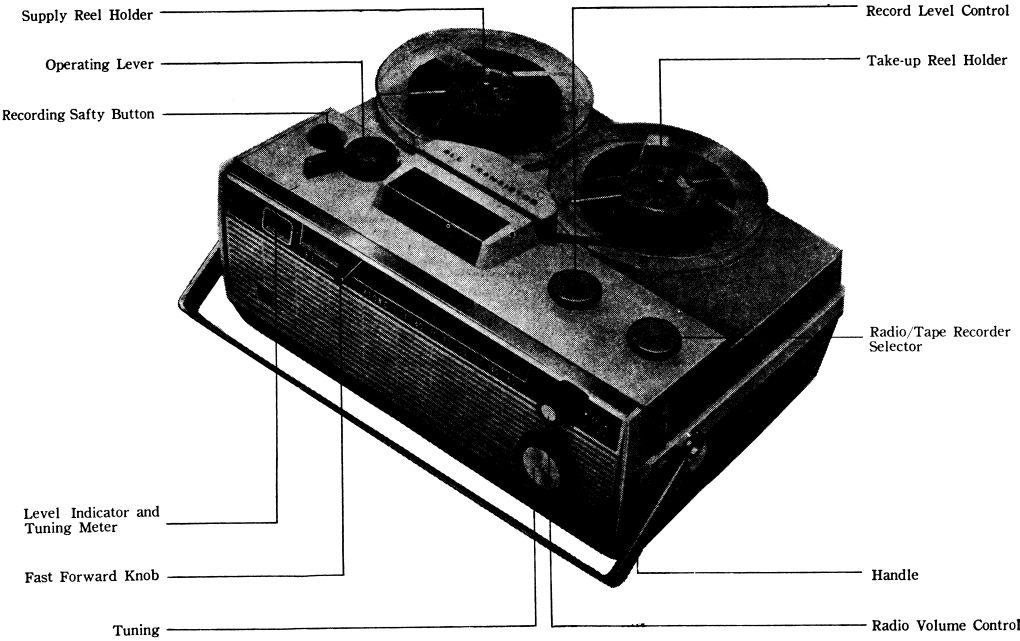


Fig. 1

## MECHANICAL OPERATING CONTROLS

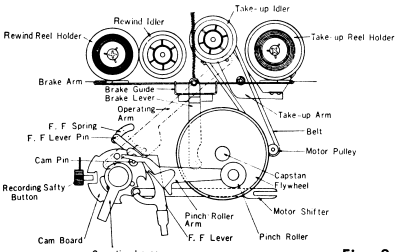


Fig. 2

### Operating Controls

The tape transport mechanism of Model RQ-530 is operated by means of the Operating Lever and Fast Forward (F.F.) Lever only. By turning the Operating Lever, the mechanical parts are actuated by the Cam-plate.

### Speed Change

The speed of the tape is changed by installing or removing the Capstan-sleeve.

### Power Source

Turning the Recording Level Control Knob clockwise switches the recorder ON and energizes the pilot lamp. When the recordings are completed, the recorder must be turned off manually and the operating lever returned to the STOP position.

## TAPE TRANSPORT OPERATION.

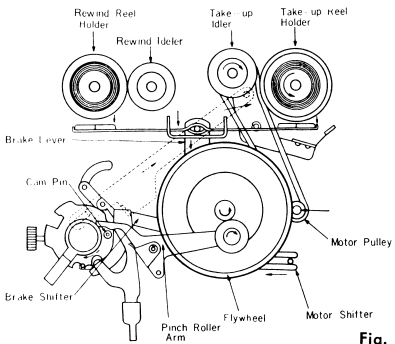


Fig. 3

### Recording and Playback (Refer to Figures 2 and 3)

The Operating Lever is set in the Playback mode for both recording and playback. The electrical circuit is in the Recording mode only when RECORD button is pressed. When the Operating Lever is turned to the RECORD or PLAYBACK position, the Cam-plate turns, pulling the Motor Shifter in the direction of the 'arrow' mark and the Motor-pulley is pressed against the Flywheel, thus causing the Capstan to rotate.

The movement of the Brake-lever and the Brake-shifter disengages the Brake from the Reel-holder.

By the movement of the Operating-arm, the Take-up Idler approaches the Reel-holder allowing the Rubber-belt to touch the Reel-holder causing the Reel-holder to rotate. The Cam-pin applies pressure to the Pinch-roller arm which, in turn, Presses the pressure-roller against the Capstan. The Tape is thus advanced. All these movements occur simultaneously by the turning of the Operating Lever which, in turn, rotates the Cam-plate.

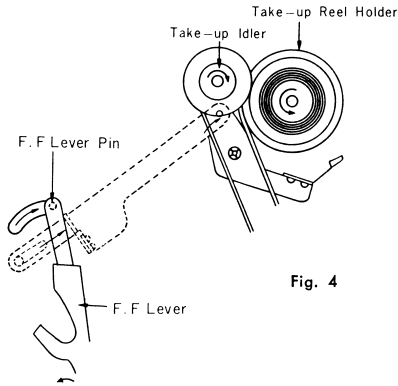


Fig. 4

### FAST FORWARD (F.F.) (Refer to Figure 4)

Fast Forward will operate with Operating Lever at the STOP position only. Pull the front F.F. Lever to the left. The F.F. Lever pin moves in the direction of 'arrow' mark; the F.F. spring is pushed up; the Take-up Idler is pressed against the Reel-holder thereby enabling the tape to continually travel forward rapidly. To release press the F.F. Lever downward.

### REWIND (Refer to Figure 5)

Turning the Operating Lever to the Rewind position moves the operating-arm which pushes the Motor-shifter in the direction of 'arrow' mark causing the Motor-pulley to disengage the Flywheel. The Take-up Idler is pressed against the Rewinding Idler which transmits rotation to the Supply-reel holder. The Pinch-roller arm is pressed by the Cam-plate causing the Pinch-roller to disengage the Capstan. The Brake-lever and Brake-shifter releases the Brake from the Reel-holder. All these movements occur simultaneously.