



SERVICE MANUAL

1968

REEL HOLDER 2

CONTROLS AND JACKS

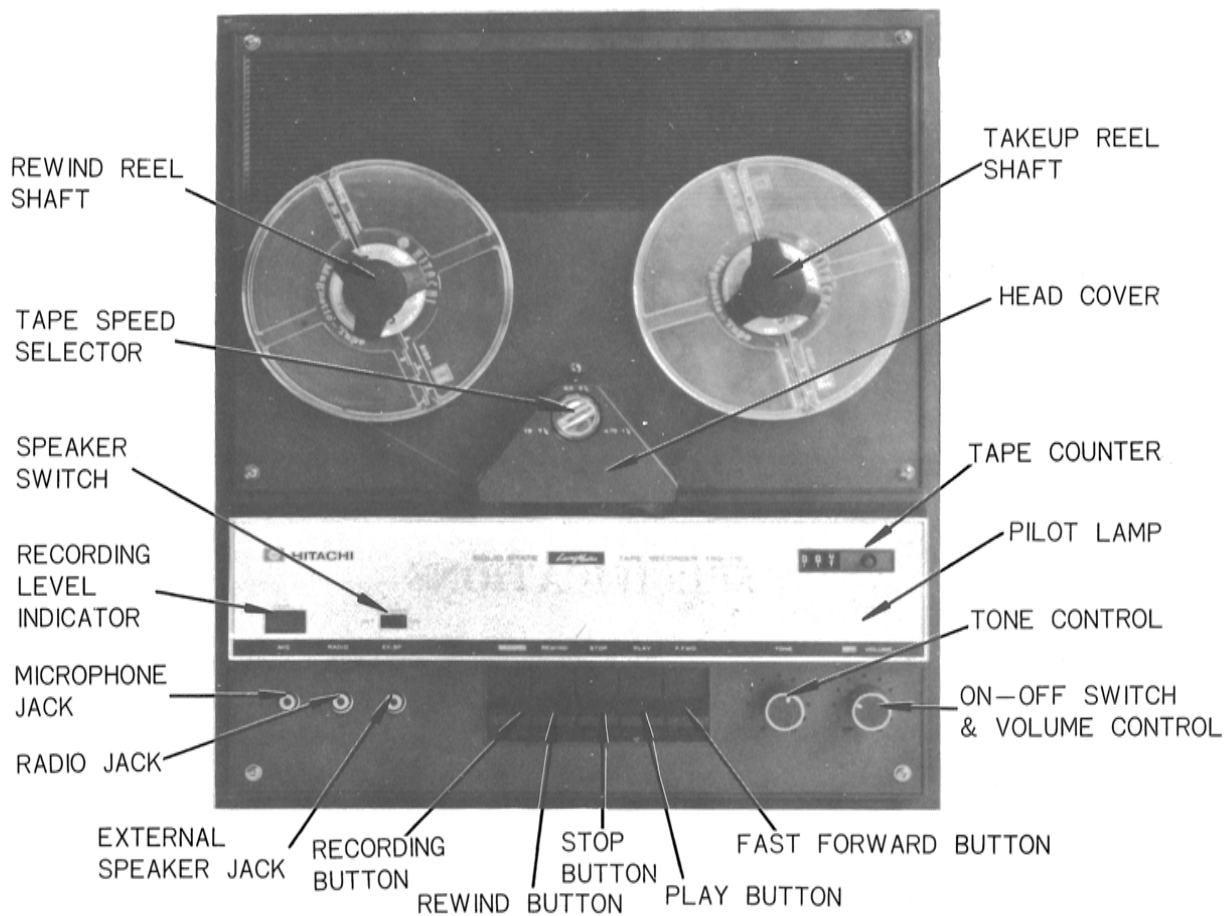


Fig. 1

TO CHANGE OVER POWER VOLTAGE

(In case of TRQ-710E)

1. Voltage change-over plug is provided in the accessory compartment and covered with the panel.
2. Remove two screws holding the panel.
3. Reinsert the voltage change-over plug to jacks of suitable voltage as shown in Fig. 2.

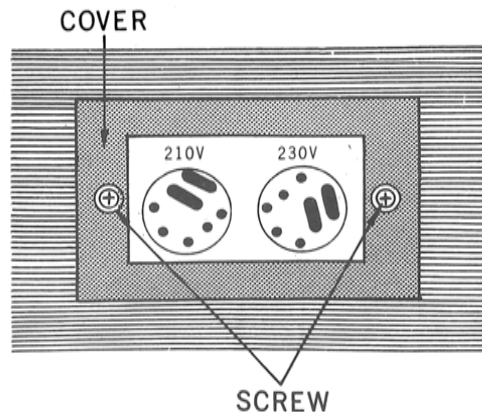


Fig. 2

DISASSEMBLY

When inspecting, repairing and lubricating, disassemble the recorder in the following manner :

1. Removal of front panel

Remove seven front panel holding screws shown in Fig.3, after removing the TONE CONTROL knob and VOLUME CONTROL knob.

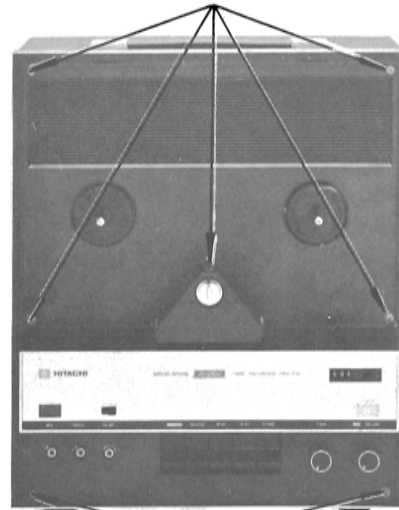
2. Pulling out the chassis

Remove four legs holding screws and two sling band holding screws shown in Fig. 4. The chassis can be removed from the cabinet.

3. Removal of printed circuit board

Remove six printed circuit board holding screws shown in Fig. 5.

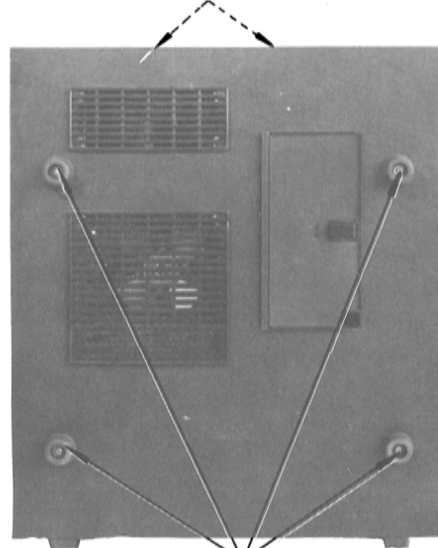
FRONT PANEL HOLDING SCREWS



FRONT PANEL HOLDING SCREWS

Fig. 3

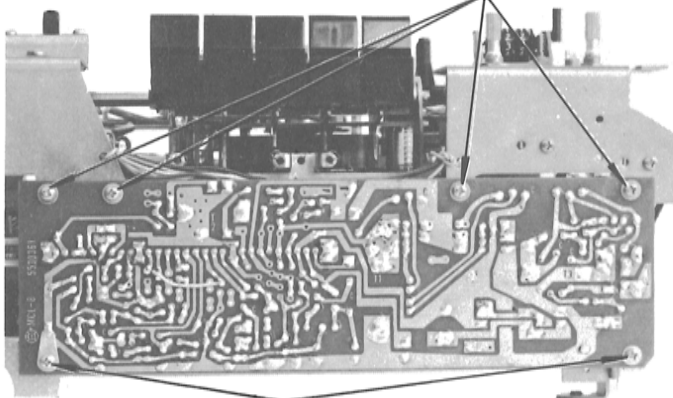
SLING BAND & CHASSIS HOLDING SCREWS



LEG & CHASSIS HOLDING SCREWS

Fig. 4

PRINTED CIRCUIT BOARD HOLDING SCREWS



PRINTED CIRCUIT BOARD HOLDING SCREWS

Fig. 5

LUBRICATING

At servicing, perform lubrication according to Fig. 6.
Lubricate a drop of SAE grade #30 or its equivalent oil
to rotating parts respectively.

To idler, pressure roller and capstan shaft, it is not always
necessary to lubricate.

Lubrication point

1. Reel base shaft Remove the screw and reel base
to lubricate around shaft.
2. Idler Spread on felt.
3. Fly wheel shaft Open oil cap and lubricate.
4. Sliding portion Wipe dirty oil and lubricate while
pushing the push-button.

Caution

Belt, idler, capstan and pinch roller may slip. When the catch oil. Wipe them alway alcohol.

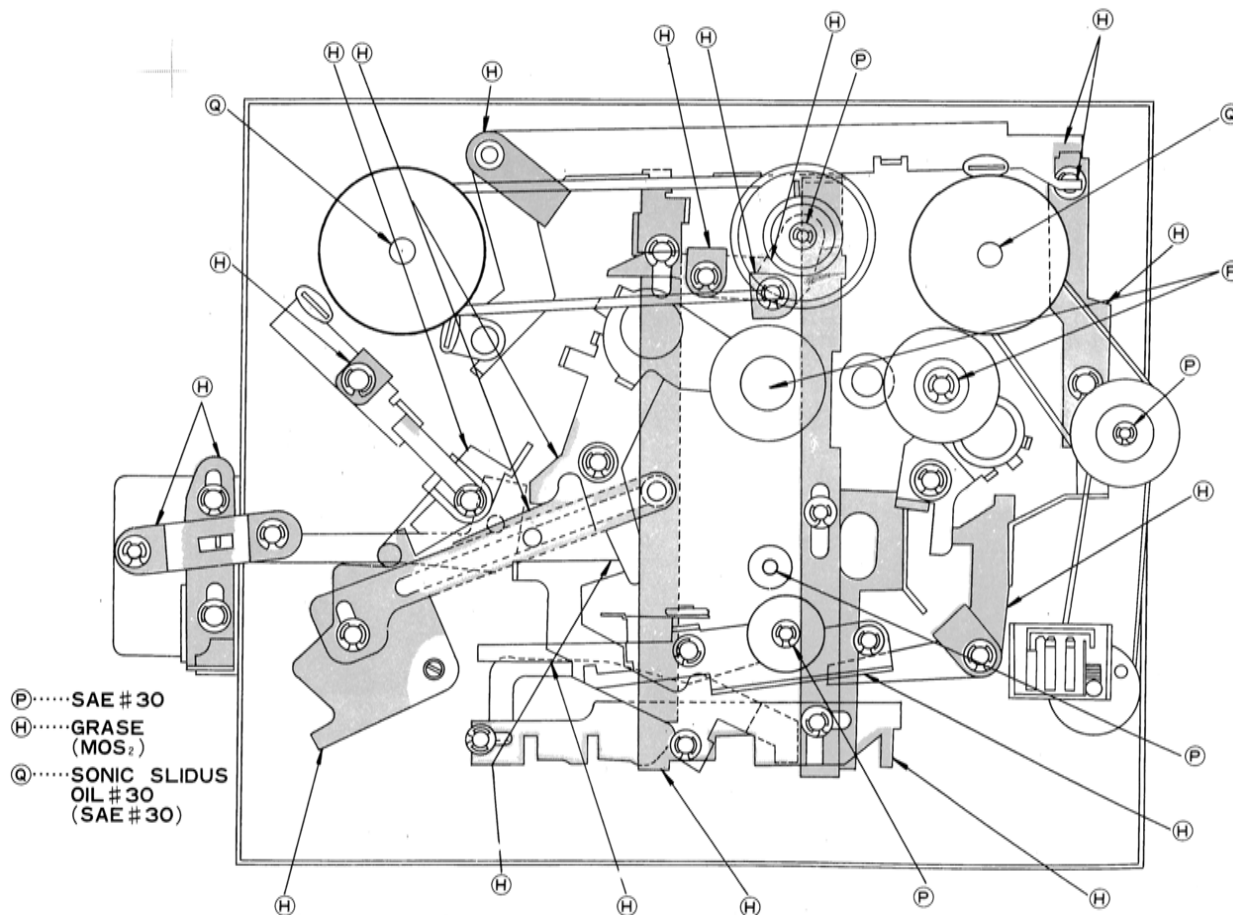


Fig. 6

ADJUSTMENT OF ELECTRIC CIRCUIT

1. Angle adjustment of recording and playback head

a) Adjustment of tape position

Check whether or not the tape is correctly positioned on the recording and playback head. This adjustment can be made by regulating the height of the tape guide (-screw).

b) Angle adjustment of record/playback head

Prepare a standard tape for angle adjustment (NAB standard, 2-tack) and adjust the screw for angle adjustment so that the voltage of the reproducing output reaches the maximum.

After the adjustment, the output level should not change excessively if the pad is slightly pressed manually.

When using an ordinary recorded tape, adjustment should be made under conditions of maximum sound volume and high-pitched by turning the volume and tone control knobs fully clockwise.

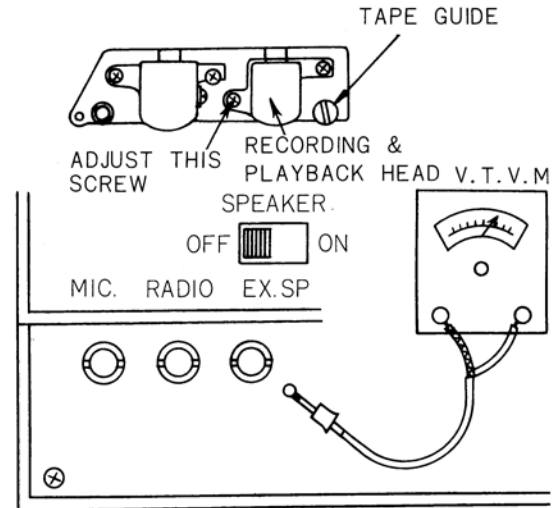


Fig. 7

2. Bias adjustment

Bias oscillating frequency of TRQ-710 is approx. 60KHz. Adjust the bias in the following way:

- Place the machine in a recording condition.
- Remove the ground side lead wire of the recording and playback head terminals, then connect the resistor (100 ohm) and connect the resistor to the ground side.

- Measure the voltage after connecting V.T.V.M (vacuum tube voltmeter) as shown in Fig. 8. and adjust the semi-fixed resistor (VR4) so that the voltage shows the value indicated 40mV.

Erasing current of the erasing head is normal when it is within 13-30mA.

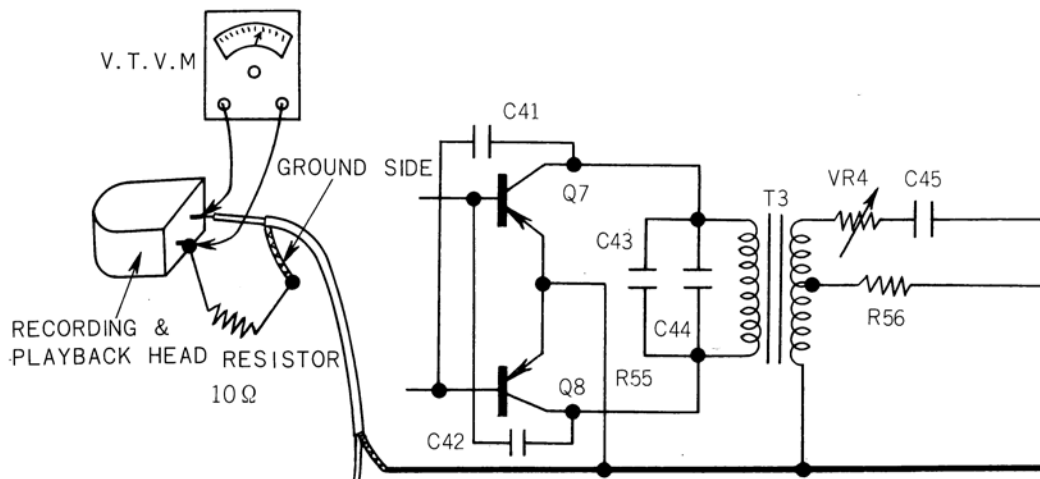


Fig. 8

ADJUSTMENT FOR MECHANICAL SECTIONS

1) Pressing force on each section

- a) Pinch roller Pressing force..... $1.0\text{kg}^{+0.2}_{-0.1}\text{kg}$.

Measuring method

Arrange so that the pinch roller presses against the capstan shaft (playback condition), and pull the pinch roller in a right angle direction against the pinch roller arm. Then measure the slight value remaining, occasioned by the pressure of the pinch roller against the capstan shaft, by using a bar gauge (rating 3kg or 5kg).

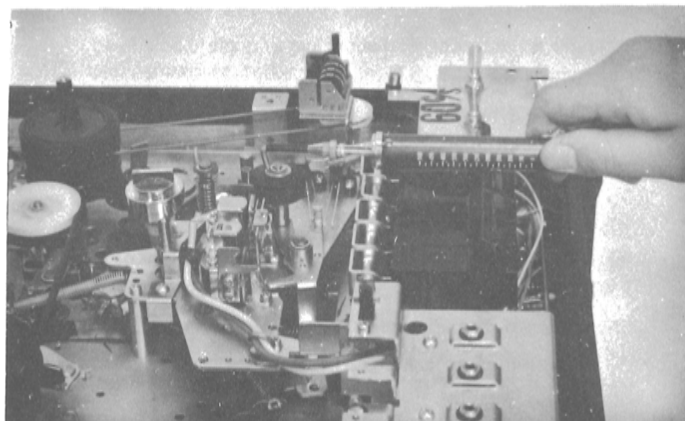


Fig. 9

- b) Pad pressing force $50\text{gr} \pm 10\text{gr}$

Measuring method

The value is measured when the pad is disengaged from the head surface by applying the tension gauge (rating 100gr) to the pad center and upper end.

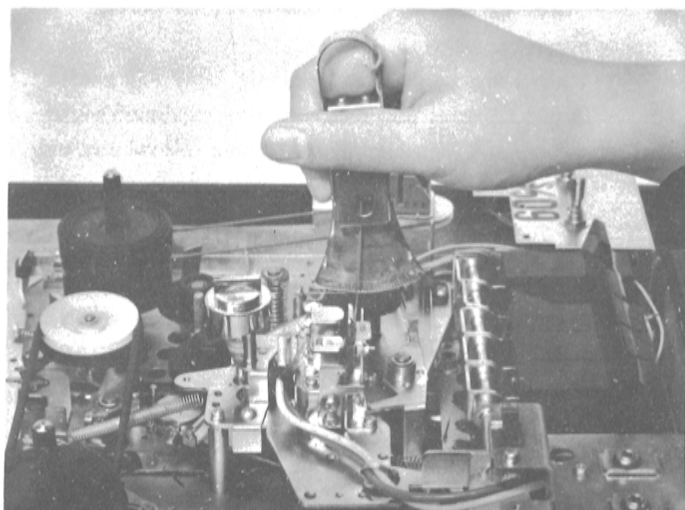


Fig. 10

- c) Winding idler pressing force $150\text{gr} \pm 30\text{gr}$

Measuring method

Lock the machine by depressing the play button (PLAY) (play condition).

Measure the value when the winding idler disengages from the motor pulley and the winding pulley at the same time.

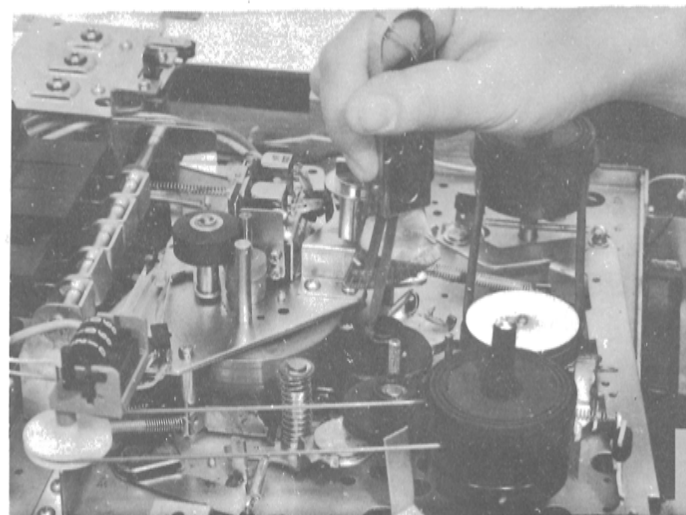


Fig. 11

d) Playback idler pressing force

When the tape speed is 19 cm/sec..... $200\text{gr} \pm 40\text{gr}$

When the tape speed is 9.5 cm/sec... $175\text{gr} \pm 40\text{gr}$

When the tape speed is 4.75 cm/sec... $150\text{gr} \pm 40\text{gr}$

Measuring method

Lock the machine by depressing the play button (PLAY) (play condition). Measure the value when the playback idler disengages from the flywheel and the motor pulley at the same time.

e) Rewinding (R) idler pressing force..... $450\text{gr} \pm 50\text{gr}$

Measuring method

Lock the machine by depressing the rewinding button (REWIND) (rewinding condition). Measure the value when the rewinding idler disengages from the motor pulley.

2) Torque of each section

a) Winding torque..... $45 \sim 80\text{gr-cm}$

Measuring method

Place the machine in a horizontal position and turn the power source to ON position: then place the 7" empty reel on the winding side reel shaft. Wind a thread inside it and measure the winding torque in a play condition (PLAY).

b) Winding and supplying friction coupling torque

Takeup or rewinding torque... $200 \sim 300\text{gr-cm}$

Measuring method

Place the machine in a vertical position, and turn the power source to ON position. Wind a turn inside the 7" empty reel and measure the torque in a fast forwarding condition of the takeup. Place in a rewinding condition for the rewinding.

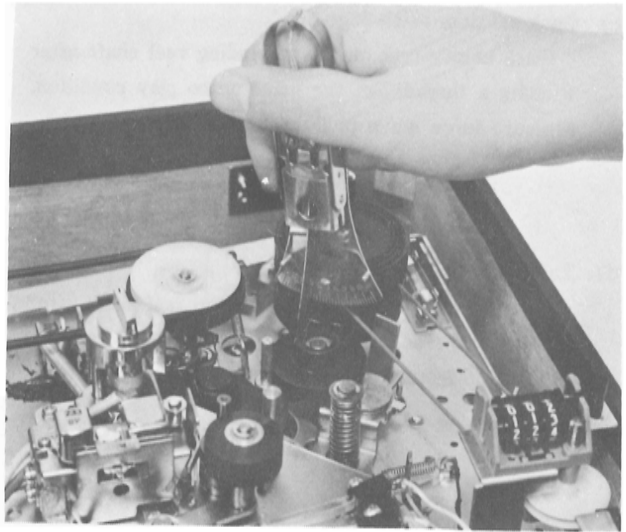


Fig. 12

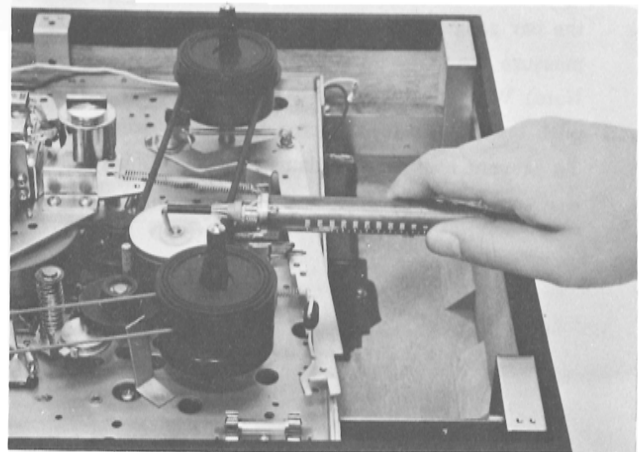


Fig. 13

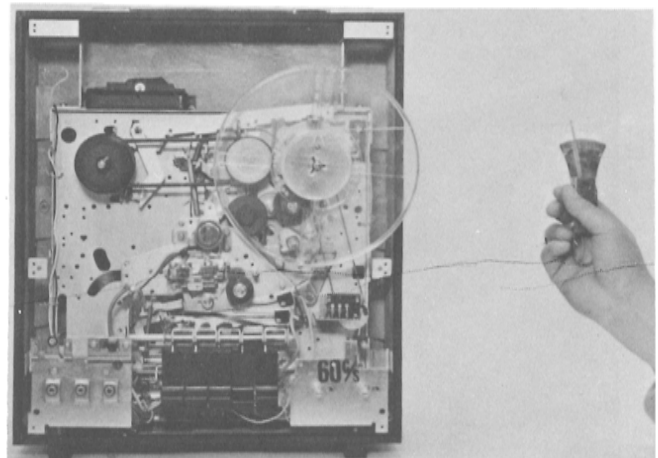


Fig. 14

MODEL TRQ-710 SERVICE MANUAL

c) Back tension.....15-36gr-cm

Place empty reel on the rewinding reel shaft after winding a thread. Set the machine to play condition. Measure force when pulling out the thread.

d) Takeup back tension.....15~35gr

Place 7" empty reel on the takeup reel shaft after winding a thread. Set the machine to rewinding condition. Measure the force when pulling out the thread.

e) Push button operating force.....Under 3.2kg

Place the machine in a horizontal position. Apply the bar gauge to the tip of the push button and measure the force until the button is locked.

Note) When applying the bar gauge directly to the push button, the push button may be damaged. To prevent any possible damage, use a rubber sheet between the gauge and the button.

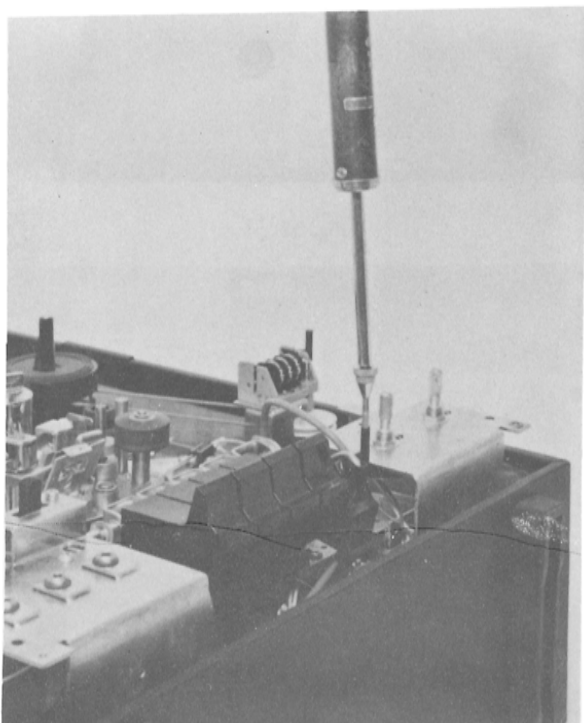


Fig. 17

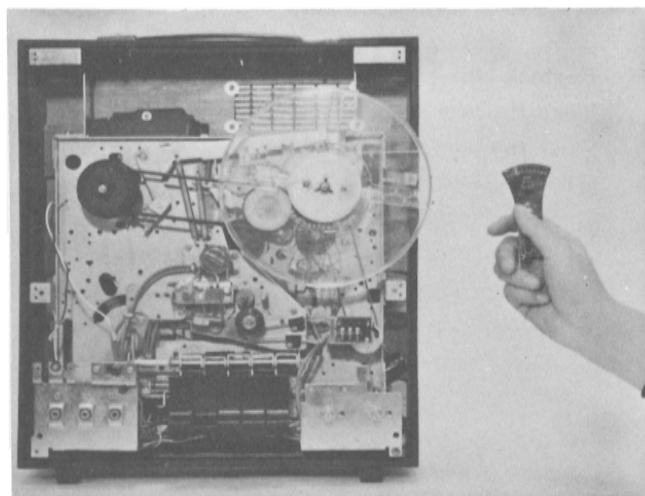


Fig. 15

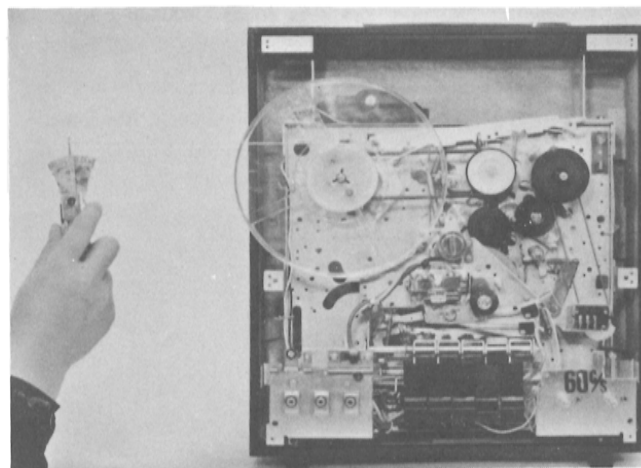


Fig. 16

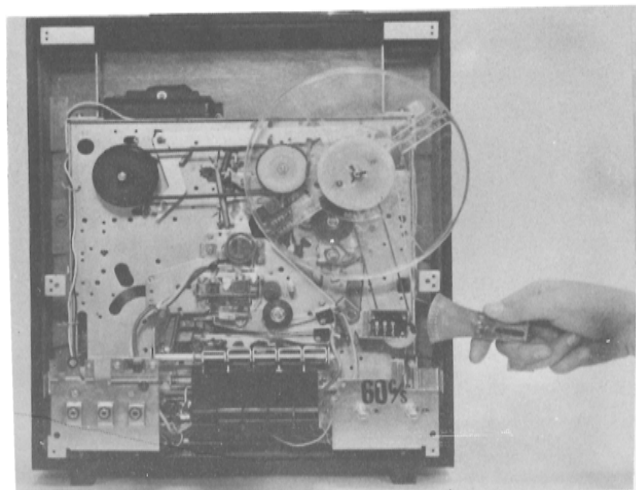


Fig. 18

3) Adjustment of installation position

a) Installation position of the muting switch (Fig. 19)

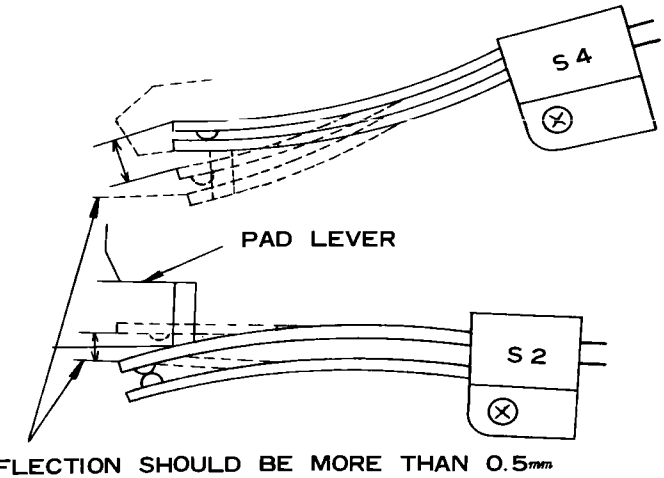


Fig. 19

b) Installation position of motor pulley (Fig. 20)

The standard distance between the chassis and the motor pulley is $2 \pm 0.1\text{mm}$. After installing the pulley in this position, try the speed change and adjust the position, while confirming that the playback idler correctly enters each stage of the motor pulley.

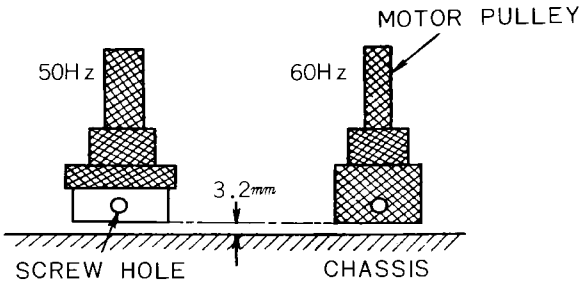


Fig. 20

TROUBLE-SHOOTING

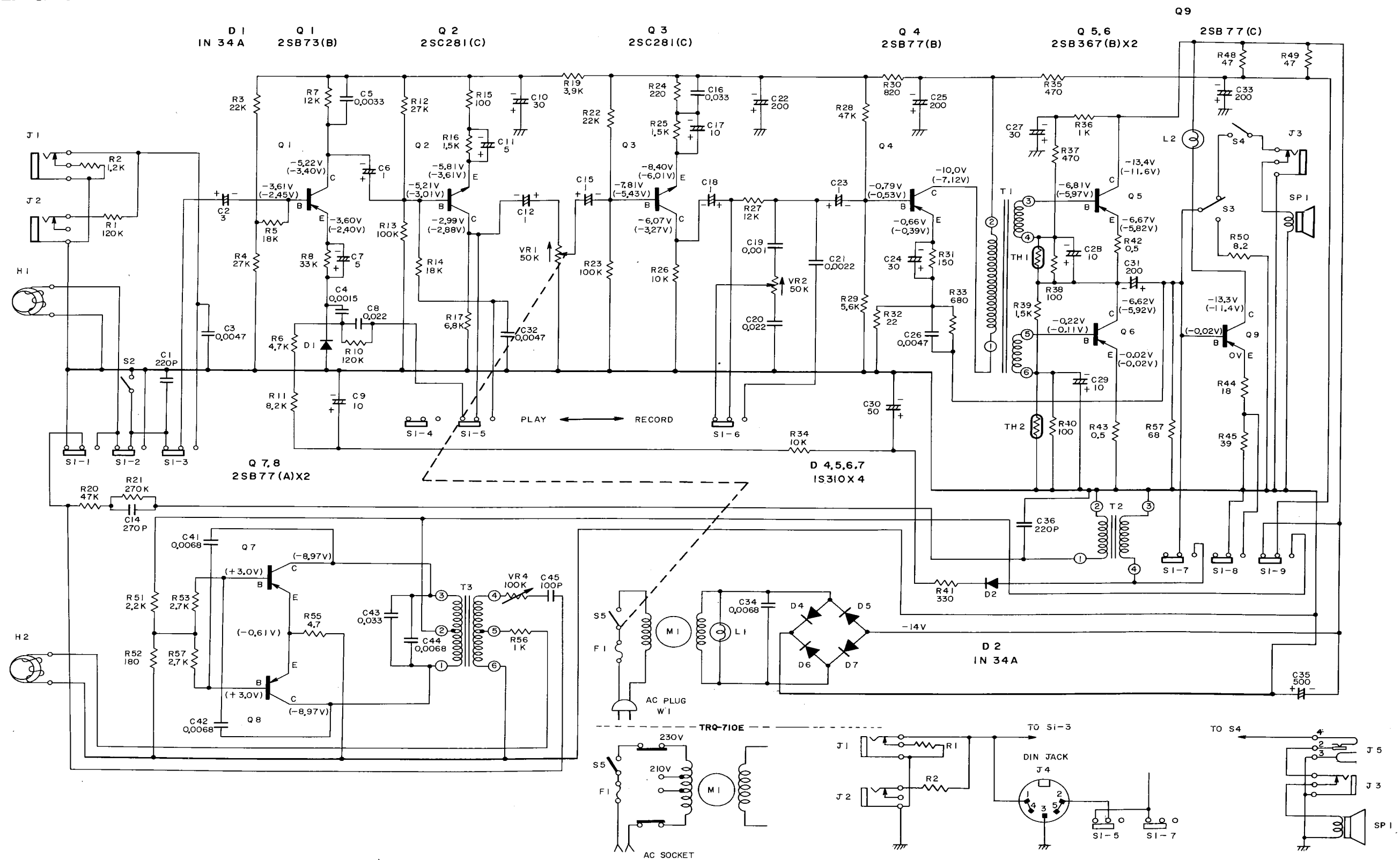
The followings are important malfunctions and their countermeasures.

While reproducing	Cause	Countermeasures
Tape does not run.	Pinch roller does not press, or it slips.	Is pressing force normal? Is the spring disconnected? Does oil adhere to the pinch roller and the capstan?
Speeds do not coincide. Unstable revolution	Heights of the playback idler and the motor pulley do not coincide. Winding torque is large. Insufficient oil on the capstan shaft.	Pulley is lowered because of loose screwing of the motor pulley. Check the pressing force on each section. Check relative mechanisms of the winding reel base. Oiling.
Disabled fast forward	Check the supply back tension. Check the winding coupling torque.	Oiling. When the torque and tension are too weak, replace the assembly.
Disabled rewinding	Check slipping portion. Check the supply coupling torque and winding side back tension. Check the pressing force of playback idler.	When they are weak and do not conform to designated value, replace the assembly. Oiling. Confirm any deformation of the spring.

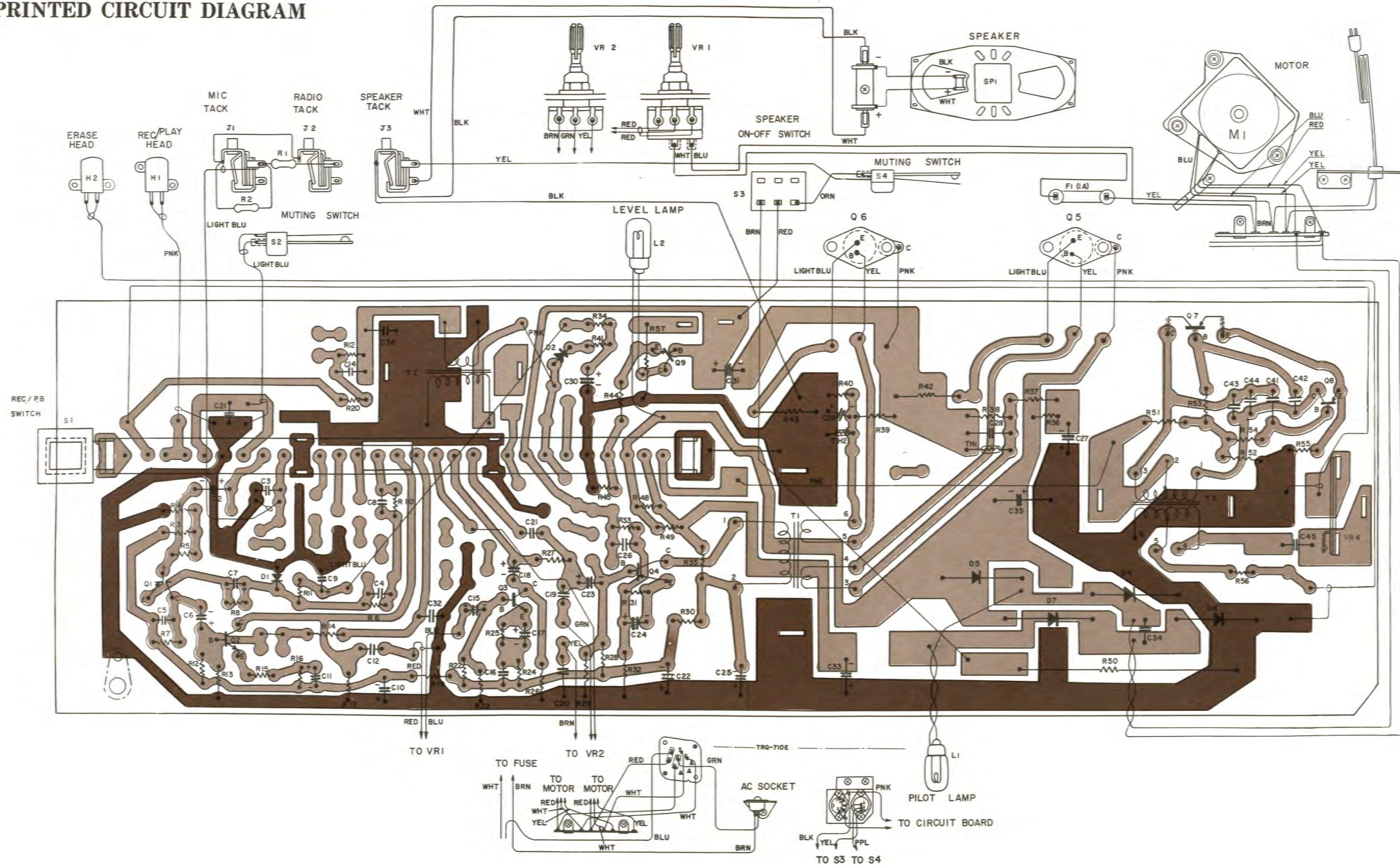
REPLACEMENT PARTS

Symbol No.	Stock No.	Description	Symbol No.	Stock No.	Description
CAPACITORS:					
C 1	0248732	Ceramic	R 19	0137858	Carbon film
C 2	0252213	Electrolytic	R 20	0137909	Carbon film
C 3	0274015	Polyester film	R 21	0137956	Carbon film
C 4	0274012	Polyester film	R 22	0137905	Same as R3
C 5	0274014	Polyester film	R 23	0137951	Same as R13
C 6	0252211	Electrolytic	R 24	0137805	Carbon film
C 7	0252215	Electrolytic	R 25	0137853	Same as R16
C 8	0275013	Polyester film	R 26	0137901	Same as R18
C 9	0252221	Electrolytic	R 27	0137902	Same as R7
C 10	0252323	Electrolytic	R 28	0137909	Same as R20
C 11	0252215	Same as C7	R 29	0137860	Carbon film
C 12	0252211	Same as C6	R 30	0137812	Carbon film
C 13	0274015	Same as C3	R 31	0137803	Carbon film
C 14	0248734	Ceramic	R 32	0137759	Carbon film
C 15	0252311	Electrolytic	R 33	0137808	Carbon film
C 16	0275014	Polyester film	R 34	0137901	Same as R18
C 17	0252221	Same as C9	R 35	0137809	Carbon film
C 18	0252211	Same as C6	R 36	0137851	Carbon film
C 19	0274011	Polyester film	R 37	0137809	Same as R35
C 20	0275013	Same as C8	R 38	0137801	Same as R15
C 21	0274014	Same as C5	R 39	0137853	Same as R16
C 22	0252532	Electrolytic	R 40	0137801	Same as R15
C 23	0252211	Same as C6	R 41	0137807	Carbon film
C 24	0252223	Electrolytic	R 42	0149101	Wire wound
C 25	0252532	Same as C22	R 43	0149101	Same as R42
C 26	0274115	Polyester film	R 44	0137762	Carbon film
C 27	0252523	Electrolytic	R 45	0137766	Carbon film
C 28	0252221	Same as C9	R 46	0134285	Composition
C 29	0252221	Same as C9	R 48	0134297	Composition
C 30	0252225	Electrolytic	R 49	0134297	Same as R48
C 31	0252532	Same as C22	R 50	0190046	Wire wound
C 32	0274115	Same as C26	R 51	0137855	Carbon film
C 33	0252532	Same as C22	R 52	0137804	Carbon film
C 34	0274116	Polyester film	R 53	0137856	Carbon film
C 35	0252535	Electrolytic	R 54	0137856	Same as R53
C 41	0274016	Polyester film	R 55	0137755	Carbon film
C 42	0274016	Same as C41	R 56	0137851	Same as R36
C 43	0275014	Same as C16	VR 1	0153606	Variable
C 44	0274016	Same as C41	VR 2	0153058	Variable
C 45	0247894	Ceramic	RV 4	0159023	Adjustable
RESISTORS:					
R 1	0137952	Carbon film	Q 1	0573018	2SB73 (B)
R 2	0122369	Composition	Q 2	0573066	2SC281 (C)
R 3	0137905	Carbon film	Q 3	0573066	Same as Q2
R 4	0137906	Carbon film	Q 4	0573004	2SB77 (B)
R 5	0137904	Carbon film	Q 5	0573049	2SB370 (B)
R 6	0137859	Carbon film	Q 6	0573049	Same as Q5
R 7	0137902	Carbon film	Q 7	0573003	2SB77 (A)
R 8	0137907	Carbon film	Q 8	0573003	Same as Q7
R 10	0137952	Carbon film	Q 9	0573119	2SB77 (C)
R 11	0137862	Carbon film	D 1	0575001	Diode
R 12	0137906	Same as R4	D 2	0575001	Same as D1
R 13	0137951	Carbon film	D 4~7	0552010	Silicon rectifire
R 14	0137904	Same as R5	TH 1	0576056	Thermistor
R 15	0137801	Carbon film	TH 2	0576056	Same as TH1
R 16	0137853	Carbon film			
R 17	0137861	Carbon film			
R 18	0137901	Carbon film			

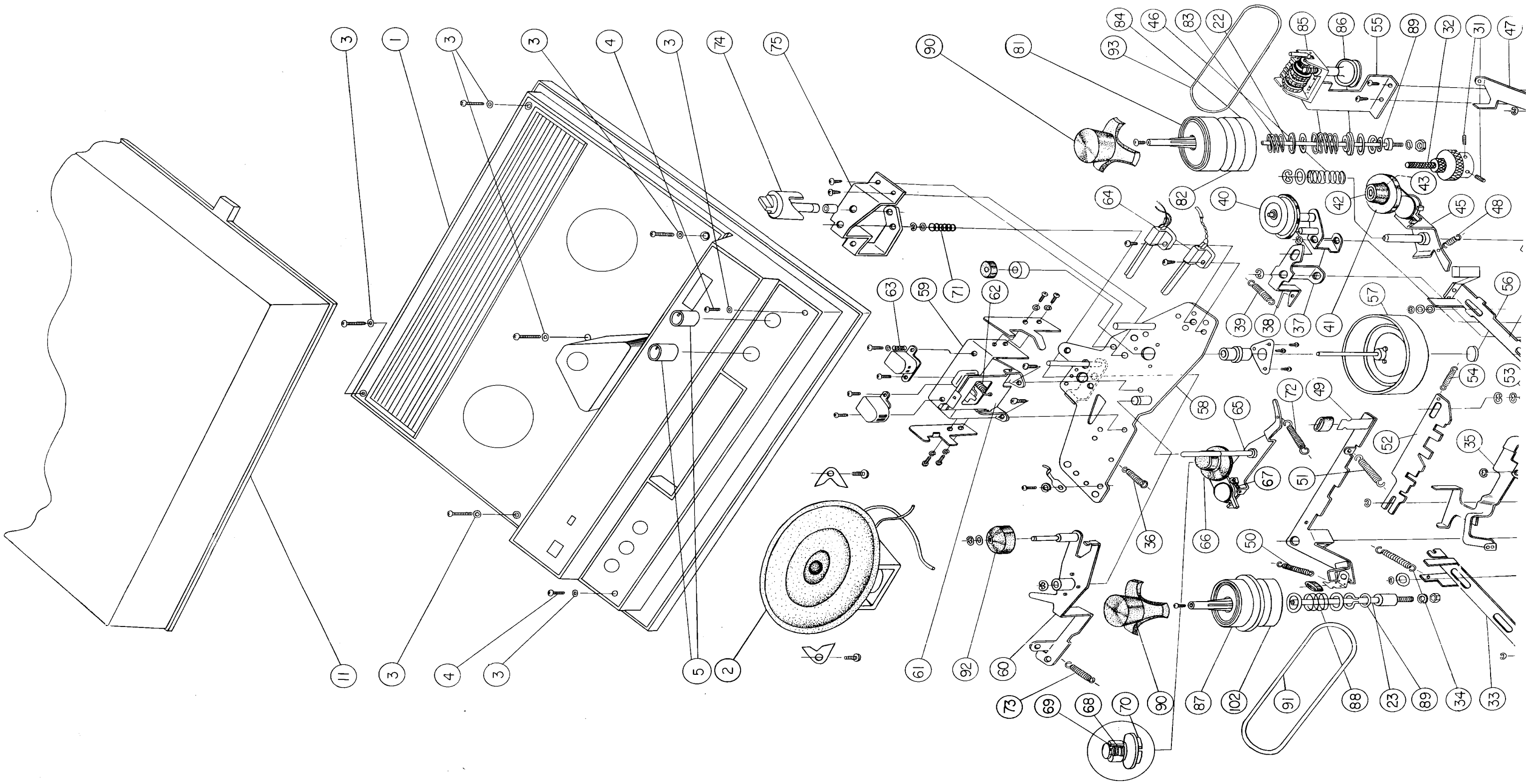
CIRCUIT DIAGRAM

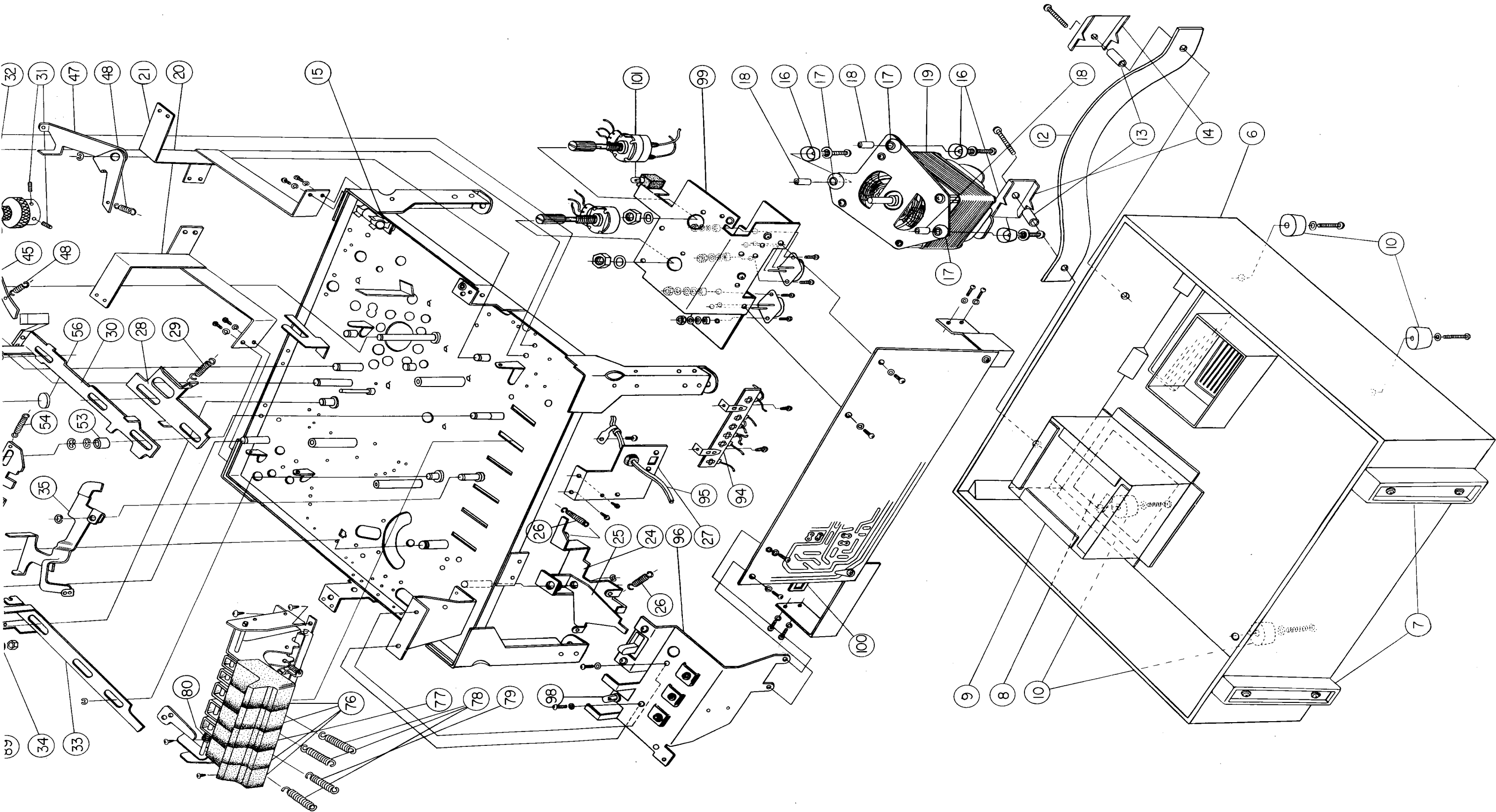


PRINTED CIRCUIT DIAGRAM



DISASSEMBLED DIAGRAM





REPLACEMENT PARTS

Symbol No.	Stock No.	Description	Symbol No.	Stock No.	Description
TRANSFORMERS:					
T	1	0441054 Audio input		0954020	Screw-4mmφ×18mm pan head screw (3 req'd)
T	2	0451107 Audio output	⑩	0941291	Holder-motor holder
T	3	0316532 Oscillator coil		0942184	Plate-motor plate
MISCELLANEOUS:				0711608	Screw-4mmφ×8mm pan head screw } (4 req'd) Washer-4mmφ spring washer
for Final assembly			⑪	0971120	Cushion-motor cushion
	0592105	Microphone	⑫	7500212	Collar-motor collar
	0593454	Cord-external cord	⑬	0514138	2P induction motor (210/230V, 50/60Hz)
①	6112091	Deck assembly		0514137	2P induction motor (120V)
	0544547	Terminal		0711406	Screw-3mmφ×6mm pan head screw } (4 req'd) Washer-3mmφ spring washer
	8781436	Screw-3mmφ×6mm tapping screw	⑭	7163611	Handle plate assembly (left)
	8811114	Washer-3mmφ washer	⑮	7163621	Handle plate assembly (right)
②	0526161	Speaker		0941796	Printed circuit board holder (let)
	8711406	Screw-3mmφ×6mm pan head screw		0711406	Screw-3mmφ×6mm pan head screw } f(2 req'd) Washer-3mmφ spring washer
	8811114	Washer-3mmφ washer		8813124	Washer-3mmφ spring washer
	8813124	Washer-3mmφ washer		0941795	Printed circuit board holder mounting
		speaker mounting			Screw-3mmφ×6mm pan head screw } (2req'd)for Washer-3mmφ spring washer
③	0941277	Washer } (7 req'd) for deck plate mounting		0941435	Fuse holder assembly
④	0954041	Screw }		8781436	Screw-3mmφ×6mm tapping screw
⑤	6600932	Knob assembly	⑯	7500501	Shaft-shaft for takeup plate
⑥	6112143	Cabinet assembly (210/230V)	⑰	7500521	Shaft-shaft for sending reel base
⑦	6112142	Cabinet assembly (120V)		0821116	Nut-4mmφ nut
⑧	7660461	Rubber base (2 req'd)		8813126	Washer-4mmφ spring washer } (2 req'd)
⑨	0015464	Storage cover assembly	⑱	0941759	Lever-recording lever (1)
	8811114	Washer-3mmφ washer	⑲	0941760	Lever-recording lever (2)
	8755413	Screw-3.1mmφ×13mm wood screw } (3 req'd) for storage cover mounting	⑳	0662187	Spring-slide switch spring
				0948537	Felt
⑩	7710213	Accessory compartment (210/230V)	㉑	0941801	Holder-speaker switch holder
	7710212	Accessory compartment (120V)		0711405	Screw-3mmφ×5mm pan head screw } (2 req'd) Washer-3mmφ spring washer
⑪	0971196	Rubber base (4 req'd)		8813124	Washer-3mmφ spring washer
	8812116	Washer-4mmφ washer		0541355	Socket-2P socket
	0711630	Screw-4mmφ×30mm pan head screw } (4 req'd) for rubber base mounting		0541358	Socket-5P socket
⑫	6112111	Upper cover assembly		7164561	Holder-socket holder
⑬	0015307	Handle		0711406	Screw-3mmφ×6mm pan screw (4 req'd)
	0736620	Screw-4mmφ×20mm oval screw (2 req'd) for handle mounting		0711406	Screw-3mmφ×6mm tapping screw (2req'd)
⑭	7500171	Collar-handle collar	㉒	0941141	Lever-fast forward lever
⑮	0945062	Metal-metal for handle	㉓	0662124	Spring-spring for fast forward
		for Chassis assembly		0941144	Lever-brake lever
	0591167	Fuse-1A fuse		0948544	Washer-fibber washer
	0591157	Holder-fuse holder		0941259	Washer- "E" type retaining washer
	8813126	Washer-4mmφ spring washer (3 req'd)	㉔	0944452	Screw
			㉕	0944779	Pulley-motor pulley (50Hz)
				0944780	Pulley-motor pulley (60Hz)
			㉖	0941150	Rewinding idler lever

REPLACEMENT PARTS

Symbol No.	Stock No.	Description	Symbol No.	Stock No.	Description
	0948544	Washer-fibber washer	S2	0539063	Switch-muting switch
	0941259	Washer- "E" type retaining washer		8781438	Screw-3mmφ×8mm tapping screw
③	0948637	Spring-rewinding lever spring	④	0539087	Switch-muting switch
⑤	0941829	Playing lever assembly	⑤	7163021	Playback lever assembly
⑥	0948316	Spring-playing lever spring	⑥	0971223	Idler wheel (R)
⑦	0941726	Rewinding idler lever assembly	⑦	0662128	Spring
⑧	0941170	Lever-rewinding idler lever (2)	⑧	0948601	Washer- idler oil washer
⑨	0662257	Spring		0948727	Washer-nylon washer
⑩	0015408	Rewinding idler assembly		0941258	Washer- "E" type retaining washer
	0636553	Washer-rewinding washer	⑨	0971215	Cap-idler cap
	0948578	Washer-nylon washer	⑩	0958067	Felt-felt for push button
	0948755	Felt	⑪	6310721	Spring-spring for tape speed selector
	0941258	Washer-"E" type retaining washer	⑫	0662129	Spring
⑪	0971150	Idler wheel		0948634	Washer-flywheel washer
	0948595	Washer-nylon washer		0941183	Cap-oil cap
⑫	0971105	Cap-idler cap		0948753	Washer-flywheel washer
⑬	0958067	Felt-felt for push button	⑬	0662199	Spring-spring for pressure roller arm
⑭	0941159	Fast forward idler assembly		8813124	Washer-3mmφ spring washer
⑮	0948631	Spring-fast forward spring		0711408	Screw-3mmφ×8mm pan head screw } (3 req'd) for sub chassis mounting
⑯	0941162	Lever-fast forward lever	⑭	6701211	Knob-tape speed selector knob
⑰	0662126	Spring	⑮	7171581	Holder-knob holder
⑱	7160951	Brake lever assembly		8781436	Screw-3mmφ×6mm tapping screw (2 req'd) for holder mounting
⑲	0662130	Spring-brake spring	⑯	6260701	Button-push button
㉑	0662222	Spring-brake lever spring	⑰	6260711	Button-push button (s)
㉒	0941175	Timing plate	⑱	0662131	Spring-push lever spring
㉓	0944467	Collar	㉑	0662062	Spring-spring for record, playback switch
㉔	0639391	Spring-spring for timing plate	㉒	0662132	Spring-shaft spring
㉕	7162322	Counter assembly		8781436	Screw-3mmφ×6mm tapping screw (4 req'd)
	8781436	Screw-3mmφ×6mm tapping screw (2 req'd)		0711406	Screw-3mmφ×6mm pan head screw
㉖	0630564	Pad-flywheel pad		8813124	Washer-3mmφ spring washer
㉗	0971258	Flywheel assembly	㉓	6410052	Takeup reel stand assembly
㉘	7163081	Sub chassis assembly	㉔	6410661	Takeup pulley assembly
㉙	0941430	Head plate assembly	㉕	6310301	Spring-spring for reel stand
㉚	0941176	Pressure roller arm assembly		7710151	Washer
㉛	0941178	Pad assembly	㉖	6700751	Pulley-takeup pulley (B)
㉜	0948461	Spring-pad spring	㉗	6310311	Spring
H1	5440012	Head-recording playback head	㉘	7500511	Collar-takeup collar
H2	0513233	Head-erase head		7660241	Washer-nylon washer
	8811233	Washer-2.6mmφ washer		7161437	Washer- "E" type retaining washer
	0711306	Screw-2.6mmφ×6mm pan head screw (3 req'd)	㉙	6410082	Supply reel stand assmby
㉝	0948102	Spring-head adjust spring	㉚	0948234	Spring-spring for supply reel stand
	0711314	Screw-2.6mmφ×14mm pan head screw		0940048	Washer
				0948662	Snap

REPLACEMENT PARTS

Symbol No.	Stock No.	Description	Symbol No.	Stock No.	Description
ⒸⒹ	0948544	Washer-fibber washer			for Printed circuit board assembly
	0944493	Screw	8811114		Washer-3mmφ washer (4 req'd)
Ⓓ⓪	7660261	Supporter-reel supporter	8813124		Washer-3mmφ spring washer (4 req'd)
ⒹⓁ	0971126	Belt-rewinding belt	0711406		Screw-3mmφ×6mm pan head screw (4 req'd)
ⒹⓂ	0971104	Roller-pressure roller			
	0636553	Washer	ⒹⒾ	7164251	Plate-jack plate
	0941258	Washer- ⅜" type retaining washer	ⒹⓇ	0544186	Terminal- lug terminal
ⒹⓃ	6350001	Belt-counter belt	T1,T2,T3	0543082	Jack-jack (red)
ⒹⓄ	0544404	Terminal- 6P terminal		0635594	Washer-jack washer
	8781436	Screw-3mmφ×6mm tapping screw (2 req'd) for terminal mounting		0948772	Washer
			S3	0532158	Switch-slide switch for speaker
ⒹⓅ	5740481	Cord-power cord (210/230V)	ⒹⓈ	0594088	Lamp-pilot lamp
	0593464	Cord-power cord (120V)			
	0711406	Screw-3mmφ×6mm pan head screw		0711406	Screw-3mmφ×6mm pan head screw
	8811114	Washer-3mmφ washer		8813124	Washer-spring washer
	8813124	Washer-3mmφ spring washer jack plate mounting			for switch mounting
			ⒹⒿ	7164261	Holder-volume holder
	8781436	Screw-3mmφ×6mm tapping screw (2 req'd) for volume holder mounting	Ⓚ⓪	5620011	Switch-slide switch
			ⓀⓁ	0594111	Lamp-pilot lamp
			ⓀⓂ	0015171	Pulley-Rewinding pulley



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