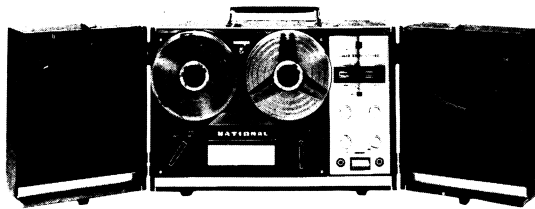


PARTS LOCATION



MODEL RS-776S

AUTOMATIC MANUAL REVERSE AND AUTOMATIC STOP TAPE RECORDER

SPECIFICATIONS

Power Source:	AC: 100, 115, 125, 200, 230, 250 volts 50/60 cps
Power Consumption:	Approx. 30W
Power Output:	2 W × 2 max.
Transistor:	2SB 345(2) 2SB 175(6) 2SB 324(4) 2SB 178(2)
Diode:	OA-70(2) FR-1M(1) SD-1U(4)
Thermistor:	QVM-300A(4) QVM-251A(1)
Recording System:	AC bias 50 Kc
Erasure System:	AC erase
Reel Size:	7" max.
Monitor System:	Sound monitor
Track System:	4 track stereo system Automatic Reverse, Manual Reverse and Automatic Stop System
Tape Speed:	2 speeds, 7-1/2 and 3-3/4 ips
Frequency Response:	80~15,000 cps at 7-1/2 ips 80~8,000 cps at 3-3/4 ips
Input:	"Mic" input 20 K Ω (2) "AUX" input 1.5 M Ω (2)
Output:	"Lineout" output 50 Ω (2) "EXT. SP" output 8 Ω (2)
Program Time:	6 hours for 7" 150% tape at 3-3/4 ips
Recording Level Indicator:	VU meter
Built-in Speaker:	6" permanent dynamic speaker
Dimensions:	20"(W) × 12"(D) × 13-1/2"(H)
Weight:	Approx. 41 lbs

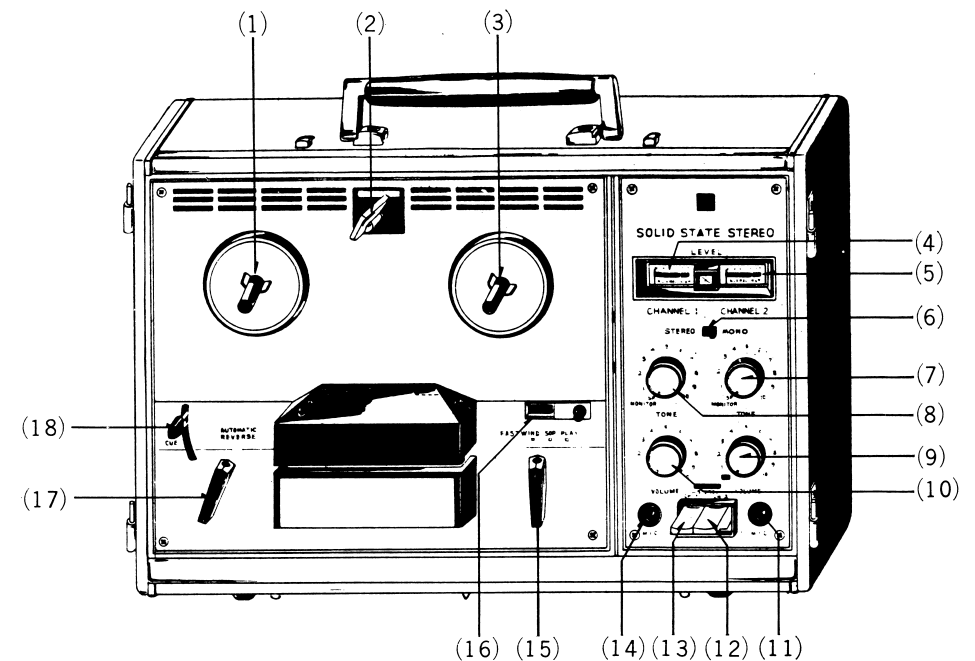


Fig. 1

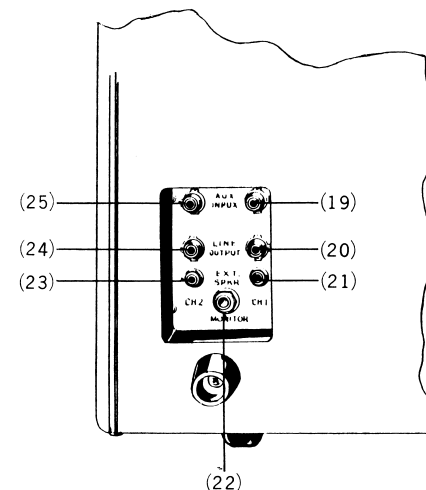


Fig. 2

- (1) Left Reel Table
- (2) Speed Selector Control Knob
- (3) Right Reel Table
- (4) Channel 1 Level Meter
- (5) Channel 2 Level Meter
- (6) STEREO/MONAUURAL Selector Switch
- (7) Channel 2 Tone Control/Monitor Switch
- (8) Channel 1 Tone Control/Monitor Switch
- (9) Channel 2 Volume Control/Power ON/OFF Switch
- (10) Channel 1 Volume Control Knob
- (11) Channel 2 Microphone Jack
- (12) Channel 2 Record Button
- (13) Channel 1 Record Button
- (14) Channel 1 Microphone Jack
- (15) Function Lever
- (16) Tape Counter
- (17) Tape Direction Selector
- (18) Instant Stop Lever
- (19) Channel 1 Auxiliary Input Jack
- (20) Channel 1 Line Output Jack
- (21) Channel 1 Extension Speaker Jack
- (22) STEREO Headphone Jack
- (23) Channel 2 Extension Speaker Jack
- (24) Channel 2 Line Output Jack
- (25) Channel 2 Auxiliary Input Jack

REVERSE

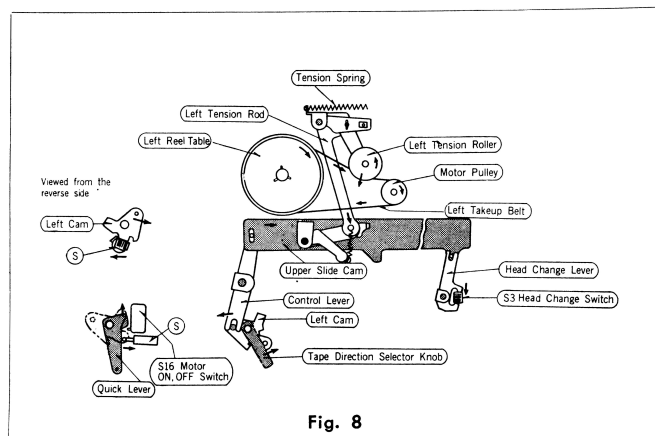


Fig. 8

A. When the Tape Direction Selector Knob is set at the REVERSE side and the Lever Knob is put into the PLAY position, the following actions occur simultaneously in the mechanism and the set is placed into the REVERSE mode.

1. The Left Cam is turned to the left moving the Control Lever, and the Control Lever slides the Upper Slide Cam to the right.
2. As the Lower Slide Cam slides to the right, the Cam of the Left Tension Rod is slipped off, and the Left Tension Rod is pulled down.
3. The Left Tension Rod depresses the Left Tension Roller, which is pressed against the Left Takeup Belt. The pressure of the Left Tension Roller against the Left Takeup Belt is made by the Tension Spring.
4. Consequently the rotation of Motor Pulley turns the Left Reel Table with the Left Takeup Belt.
5. Pressing method of the Pinch Roller against the Capstan is same as the method in FORWARD.
6. The motor gives REVERSE by the Motor Rotation Selector Switch (S12).
7. Back Tension is made by the Back Tension Spring under the Right Reel Table.

B. In case of Automatic Inversion by the Sensing Tape.

1. The Plunger Rod is pulled upward, the Inversion Rod Hook is disengaged, and the Inversion Rod is moved to slide to the right.
2. The Inversion Rod rotates the Left Cam for placing the set into REVERSE mode.

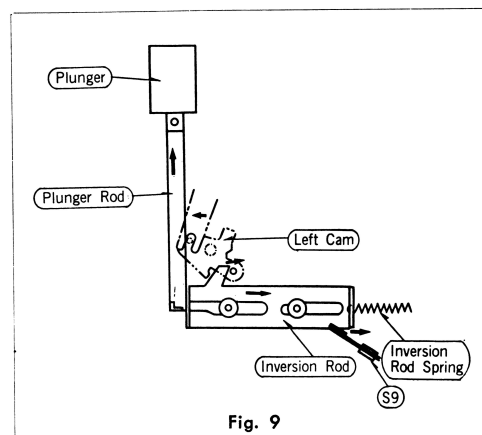


Fig. 9

NATIONAL MODEL RS-776S

N31-2.

FAST WIND ▶

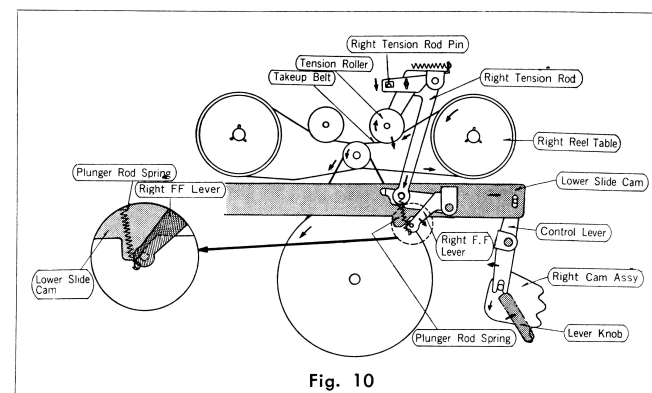


Fig. 10

When the Tape Direction Selector Knob is placed into the FORWARD position and the Lever Knob is turned to FAST WIND position, the following actions occur simultaneously and the mechanism is put into FAST WIND ▶ mode.

1. The Control Lever is moved by means of Right Cam, and the Lower Slide Cam is moved to slide to the right.
2. The Right FF Lever is depressed by the Lower Slide Cam, and also the Cam part of the Right Tension Rod is slipped off.

3. By means of the Plunger Rod Spring, the Right Tension Rod is depressed, and the Tension Roller is pressed against the Right Takeup Belt by the work of the Right Tension Rod pin. The pressure of the Tension Roller against the Takeup Belt owes to the strength of Plunger Rod Spring and Tension Spring. Consequently it is pressed more strongly than in case of FORWARD mode, thereby securing FAST WIND ▶.

FAST WIND ◀

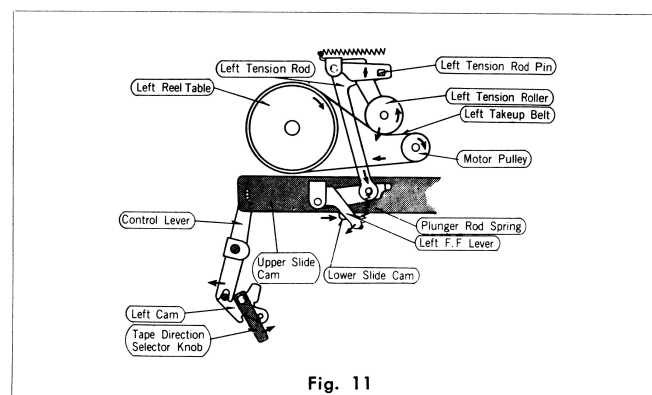


Fig. 11

When the Tape Direction Selector Knob is put into the REVERSE position and the Lever Knob is turned to FAST WIND, the following actions occur simultaneously and the mechanism is placed into the FAST WIND ◀ mode.

1. The Right Cam moves the Control Lever, causing the Lower Slide Cam to slide to the right.
2. The Lower Slide Cam depresses the Left FF Lever, and the Cam part of the Left Tension Rod is also released.
3. The Left Tension Rod is depressed by the work of

Plunger Rod Spring, and the Tension Roller is pressed against the Left Takeup Belt by the Left Tension Rod Pin. The pressure of the Tension Roller against the Takeup Belt owes to the forces of Plunger Rod Spring and Tension Spring. Therefore, it is pressed more strongly than in case of the REVERSE mode, facilitating FAST WIND ◀.

4. The Motor revolution can be reversed by the Motor Rotation Selector Switch (S12).

MECHANISM ADJUSTMENTS

PINCH ROLLER ADJUSTMENT

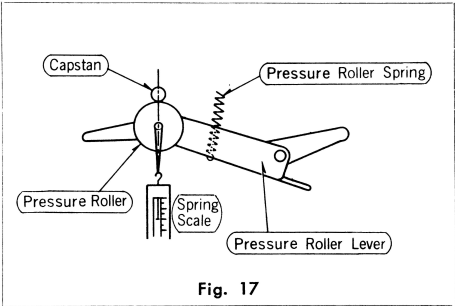
1. The Shaft of Pinch Roller must be parallel to the Shaft of Capstan.
2. The pressure between Capstan and Pinch Roller can be checked as follows:

a) Set the recorder in PLAY mode.

b) Hook a loop of thread at the Pinch Roller Shaft and the Spring Scale, and pull it until the Pinch Roller is disengaged from the Capstan.

c) The proper pressure is about 49.7~64.0 ozs. (1.4~1.8 kg).

d) If the pressure is not within the above range, adjust the pressure of the Pinch Roller and the Pinch Roller Spring.

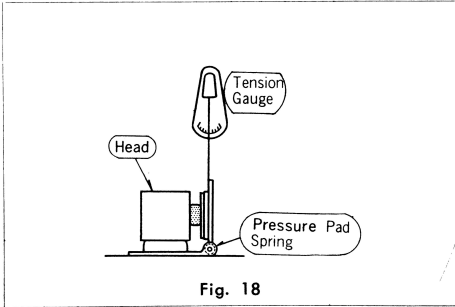


PRESSURE PAD ADJUSTMENT

1. The Pad Felt, when off, has to be replaced.
2. The pressure of Pressure Pads should be about 1.24~1.60 ozs. (35~45g).
3. When the Pad Pressure is beyond the specified limits check as follows:

a) The Pad Spring, if its pressure is insufficient, has to be replaced.

b) In case of high spring pressure, replace it or pull an end of the spring to adjust the spring pressure.



ADJUSTMENT OF TAKEUP TENSION

A. TAKEUP TENSION IN FORWARD/REVERSE MODE

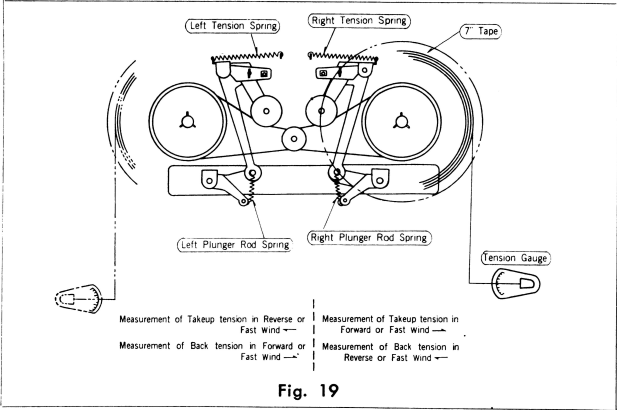
1. Place a 7" tape reel to the Right (Left) Reel Table, braw out the tape in 12" length, make a ring of the tape end, and apply it to a Tension Gauge.
2. Place the set into FORWARD (or REVERSE) mode. At this time the Tension Gauge has to follow the tape being taken up. (ab. 2").
3. If the value, which is thus measured, is 0.70~2.48 ozs (20~70g), the condition is normal. In order to obtain an exact value, repeat the same measurement several

- times to detect a fixed value.
4. When this takeup tension is beyond the specified limits:

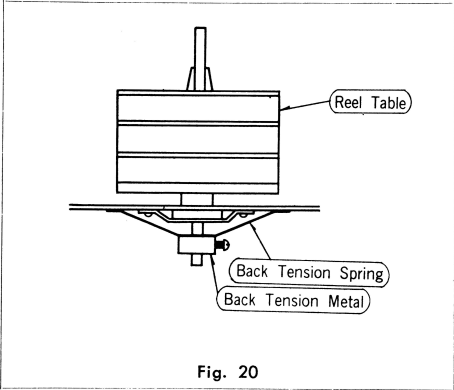
a) Dust should be removed out of all the driving parts. Lube oil has to be when wanted.

b) When the tension of the Right Tension Spring (or Left Tension Spring) is insufficient, the Spring Hook part is bent to both sides and the spring pressure is adjusted.

B. TAKEUP TENSION OF FAST WIND (or)



1. It is conducted in the same way as in case of FORWARD But the set has to be placed in FAST WIND (or).
2. If the value thus measured is more than 3.52 ozs (100 g), the set is in the normal condition.
3. In case that this takeup tension in insufficient replace the Right Plunger Rod Spring (or Left Plunger Rod Spring).



C. MEASUREMENT OF BACK TENSION

1. If the Back Tension in PLAY or FAST FORWARD mode is 0.46~0.78 ozs. (13~22g), the set is in the normal condition.
2. In case that this Back Tension is beyond the specified limits adjust it with the Back Tension Spring.

a) In case of a low back tension, adjust the Back Tension Metal or the Counter Pulley moving the Back Tension Spring toward compression.

b) In case of a too high back tension, the contrary procedure applies.

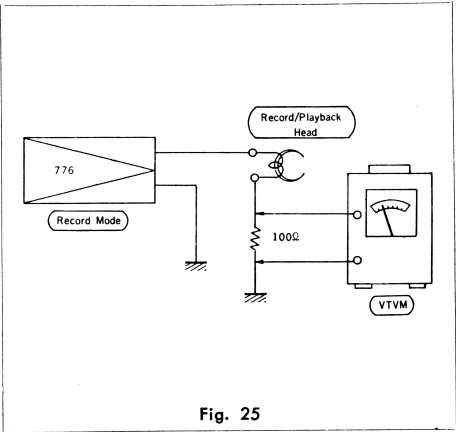
RELATION BETWEEN NUMBER OF REVOLUTIONS OF MOTOR AND CAPSTAN SLEEVE

Such a Capstan Sleeve as will accord with the number of revolutions of Motor must be used, because of the unevenness in the number of revolutions of revolutions of motor.

CAPSTAN SLEEVE					MOTOR			
Ref. No.	Parts No.	Parts Name	Outside Dia. of Shaft	Color	Ref. No.	Parts No.	Stock NO.	Number of Revolutions (r.p.m.)
181	M1034	60 c/s Capstan Sleeve-A	8φ ± 0.03	Color-less	177	M1030	4KC-20AA	1755 and over
181	M1048	60 c/s Capstan Sleeve-B	8.09φ ± 0.03	Black	177	M1050	4KC-20AB	1735~1759
181	M1409	60 c/s Capstan Sleeve-C	8.16φ ± 0.03	Red	177	M1051	4KC-20AC	1734 and less

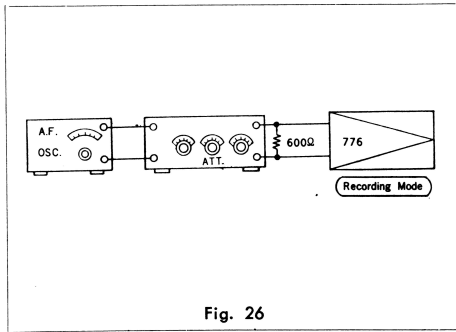
RECORD BIAS CURRENT
ADJUSTMENT

- Instruments Required: VTVM, 100Ω Resistor.
- Measuring Circuit: Refer to Fig. 25.
1. Insert a 100Ω resistor in series with ground lead wire of record/playback head and connect VTVM across resistor.
 2. When recorder is set to RECORD mode with volume control at minimum, BIAS (to be fed to record/playback head) will be indicated at VTVM.
 3. As standard bias current is set at 0.5 mA VTVM reading uldb shoe 50 mV (100Ω × 0.5 mA).
 4. If out of range, adjust:
Channel 1- VC1 (When in nofmal operation)
VC2 (When in reverse operation)
Channel 2- VC3 (When in normal operation)
VC4 (When in reverse operation)



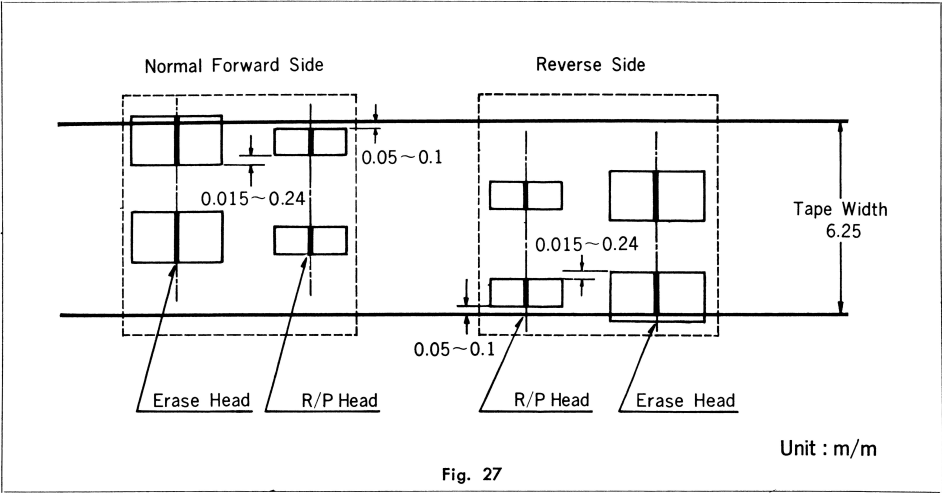
OVERALL FREQUENCY RESPONSE
CHECK

- Instruments Required: AF Generator, Attenuator, 600Ω Resistor, VTVM.
- Measuring Circuit: Refer to Fig 26.
1. As shown in Fig. 26, connect output of AF Generator to AUX input of the recorder through Attenuator (termi nate with 600Ω if impedance of attenuator is 600Ω).
 2. Set recorder to RECORD mode with volume control at maximum position.
 3. Set AF Generator for 1Kc and adjust Attehuator until VU meter indicates 0-VU, continue turning Attenuator to attenuate 10 db This level will be "Standard" level for Overall Frequency Response check.
 4. With above setting, record signals from 100 to 10,000 cps on the recorder.
 5. Change connections as shown in Fig. 21. (connect input of VTVM to Line Output).
 6. Playback recording (see 4 above) set volume control so that -1.5dbm reading is obtained at on 1Kc reference tone. Without changing setting, conduct frequency response checks. Tone control should be set at "nearly maximum" position.



7. Frequency response curve to be within ±5 db of 1,000 cps reference for 100 to 10,000 cps; ±5 db for 100 to 5,000 cps for 3-3/4 ips.
8. If the frequency response is not within the above range, adjust "Record bias current" after conducting "head azimuth adjustment" and "playback response check".

RECORD/PLAYBACK HEAD AZIMUTH ADJUSTMENT



- Instruments Required: VTVM, Standard Alignment Tape.
- Measuring Circuit: Refer to Fig. 21.
1. Connect VTVM to Line Output.
 2. Thread Standard Alignment Tape (azimuth adjustment) and set recorder to PLAYBACK mode. Set tone control to maximum and volume control to appropriate position provided it will not cause "saturation".
 3. Turn head adjustment screw for maximum reading at VTVM.
 4. After completion of above adjustment, lock screw with paint.
 5. Adjust levels of heads (in relation to Erase Head) as in diagram below. For quick check, lift pressure pad assemblies with fingers and note position of tape in relation to heads. (Fig. 27)

LUBRICATION AND CLEANING

- All rotating parts are factory lubricated. However, after every 500 hours of use, the following lubrication procedure should be followed:
- Quality machine oil should be used; ESSO's spindle oil #34 is recommended. These parts are all marked as "OIL". Excessive oiling must be avoided to avoid slippage.
- 2 drops to the Capstan bearing
 - 1 drop to the pinch roller bearing
 - 1 drop to the tension roller bearing
 - 2 drops to the reel Table bearing
 - 1 drop to the rewind idler bearing
- Record/playback/erase heads, tape guides, capstan and pinch roller are subject to an accumulation of tape coating residue. Use a soft cloth dampened with carbon tetrachloride to clean above mentioned parts.
- Rubber, drive belt and pinch roller must be kept free from oil or grease. Use soft cloth and cleaning fluid (carbon tetrachloride) to clean oil and grease from rubber parts. When cleaning these parts, do not forget to clean other rollers which are in contact with these parts. Always clean the unit after service is completed.

Ref. No.	Description	Parts No.
C54	Capacitor, Elec. Tubular, 50 μ F	ECE-A25V50
C55	Capacitor, Elec. Tubular, 2000 μ F	ECE-M35R2000Y
C56	Capacitor, Elec. Tubular, 60 μ F	ECE-C200V60
C57	Capacitor, Paper, 0.1 μ F	ECN-R4104X
C58	Capacitor, Motor Starter, 1.5 μ F	AF-350V1R5 μ
C59, C60	Capacitor, Mylar, 0.01 μ F	ECQ-MO5103MZ

VARIABLE CAPACITORS

VC1, VC2, VC3, VC4	Capacitor, Trimmer, 30 PF ~ 130 PF	QCV-2013
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TRANSISTORS

Tr1, Tr2	Transistor,	2SB 345
Tr3, Tr4, Tr5, Tr6 Tr7, Tr8	Transistor,	2SB 175 (A)
Tr9, Tr10, Tr11, Tr12	Transistor,	2SB 324 (M, N)
Tr13, Tr14	Transistor,	2SB 178 (A)

DIODES

D1, D2	Diode,	OA-70
D3	Diode, Silicon,	FR-1M
D4, D5, D6, D7	Diode, Silicon,	SD-1U

THERMISTORS

SM1, SM2, SM3, SM4	Thermistor,	QVM-300A
SM5	Thermistor, (MT-25T)	QVM-251A

TRANSFORMERS

T1, T2	Transformer, Input	QLA-0116
T3	Transformer, Output	QLA-0338
T4	Transformer, Output	QLA-0339
T5	Transformer, Oscillator	QLB-115-1
T6	Transformer, Power	QLP-0381

COIL

L1	Coil, Erasing Head Dummy	QLH-9004
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SWITCHES

S1, S2	Switch, Record/Playback Selector	ESD-1219-1
S3	Switch, Head Change	QSS-1008
S4	Switch, Speed Selector	ESR-E262F50AE
S5	Switch, F/R Gain	QSS-1007
S6	Switch, Stop	QSS-1006
S7	Switch, Mixing	ESD-105
S8, S9, S10	Switch, Leaf	QSB-0140

Ref. No.	Description	Parts No.
S11	Switch, Part of VR10, Power	—
S12	Switch, Slide, Motor Rotation	QSS-1009
S13-1	Switch, Part of VR15, Monitor	—
S13-2	Switch, Part of VR16, Monitor	—
S14	Switch, Part of R2, Reverse	—
S15	Switch, Part of R1, Shut Off	—
S16	Switch, Micro, Motor ON/OFF	QSS-1009
S17	Switch, Discharge Protection	—
S18	Switch, AC, Voltage	ESR-E126S20BE

ELECTRICAL PARTS

VU1, VU2	VU Meter	QSL-17-1
31	Head, Record-Play-Erase	WY-418Z
32	Head, Record-Play-Erase	WY-419Z
33	Speaker	EAS-16P49SM
34	Relay, Power	QSK-0103
35	Plunger	QME-104
36	Connector, Multi, 21-P	QJS-0106
37	Connector, Multi, 17-P	QJS-0107
38	Connector, Multi, 11-P	QJS-0108
39	Jack, Pin, Assy.	QJA-0902
40	Jack, Miniature (M3A)	QJA-102
41	Jack, Phone (TMS)	QJA-0203
42	Jack, Stereo-phone	QJA-205-1
43	Jack Plate	QGJ-1047
44	Cord, AC Power	QFC-1022
45	Lamp, Pilot	QVL-101
46	Socket, Pilot Lamp	QJS-101
47	—	—
48	Lug Board	QJT-4002
49	Bushing, Cord	QTD-1126
50	Lug Board, 2-P	QET-1051
51	Plate, Terminal, Plug-in	QJS-0306
52	Printed Circuit Board-A, Assy.	QEI-0107
53	Printed Circuit Board-B, Assy.	QEI-0108
54	Plug, Multi 21-P	QJI-0055
55	Plug, 4-P	QJP-0925
56	Socket, 4-P	QJS-0504
57	Pipe, Insulation, Capacitor Lead	QBK-1043
58	Jack Board-A, Microphone	QGJ-1045-2
59	Jack Board-B, Microphone	QGJ-1046-2
60	Button, Record	QTW-1004
61	Spring, Ganging Rod	QDT-1200
62	Spring, Record Lever	QDT-1179
63	Plate, Switch, Assy.	QJI-0090-1
64	Cord, with Plug	QFC-2010
65	Spring, Slide Switch	—
	Holder-D, 2-P Fuse	QTF-1002
	Fuse 1.2A	QJF-1002
	Angle, AC, Voltage	QTT-1068

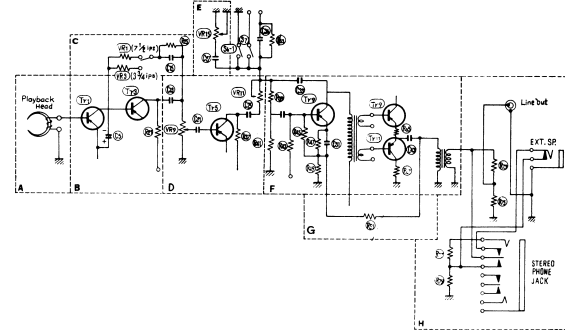
Ref. No.	Description	Parts No.
212	Washer, Spring SW3φ	QWS-302U3
213	Screw, —M2φ×5	QHM-120×4U3
214	Washer, Spring SW2φ	QWS-202U3
215	Pad Assy., Left	—
216	Pad Assy., Right	—
217	Spacer, Head	QMZ-1017
218	Shield Plate, Head	QTS-1070
219	Nut, Hex., N4φ	QNN-4022U3
220	Washer, Spring SW 4φ	QWS-402U3
221	Plate Assy., (Upper)	—
222	Lever, Head Selector	QML-1145
223	Stop Ring, E5φ	QNS-504T3
224	Lever Shaft, Pinch Roller	QMS-1131
225	Lever Assy., Pinch	—
226	Rubber, Insulating	QBF-1006
227	Stop Ring, E3φ	QNS-304T3
228	Washer, Fiber 4.2×8×0.5	QBK-7006
229	Roller-C	QDP-1101
230	Screw —M3φ×5	QHM-230×5U3
231	Washer, Lock L3φ	QWG-302K3
232	Stop Ring, E5φ	QNS-504T3
233	Arm Assy., Speed Select Clicker	QXA-0035-1
234	Plate, Speed Select Adjustment	QMF-1161
235	Cam, Speed Select	QMF-1158
236	Screw —M3φ×8	QHM-230×8U3
237	Washer, Fiber 6.2×11×0.5	QBK-7003
238	Screw, —M3φ×6	QHM-230×6U3
239	Plate, Brake Shoe Holding	QMF-1111
240	Arm Assy., Brake	—
241	Screw, —M3φ×6	QHM-230×6U3
242	Retainer, Brake Arm	QMS-1170
243	Washer, Lock L3φ	QWG-302K3
244	Washer, Spring SW3φ	QWS-302U3
245	Brake Holder	QMH-1028
246	Screw —M3φ×5	QHM-230×5U3
247	Washer, Spring SW3φ	QWS-302U3
248	Stop Ring, E5φ	QNS-504T3
249	Washer, Fiber 6.2×11×0.5	QBK-7003
250	Brake Arm Assy., Left Reverse	QXA-0040
251	Brake Arm Assy., Right Reverse	QXA-0041
252	Stop Ring E5φ	QNS-504T3
253	Tension Arm Assy., Left	QXL-0097
254	Screw —M3φ×5	QHM-230×5U3
255	Washer, Lock L3φ	QWG-302K3
256	Plate, Tension Pin Adjustment	QMF-1114
257	Stop Ring E5φ	QNS-504T3
258	Tension Rod Guide Assy., Left	QXL-0097
259	Washer, Fiber 6.2×11×0.5	QBK-7003
260	Stop Ring E3φ	QNS-304U3
261	Tension Arm Assy., Right	QXA-0036
262	Tension Rod Guide Assy., Right	QXL-0096
263	Stop Ring E5φ	QNS-504T3

Ref. No.	Description	Parts No.
264	Washer, Fiber 6.2×11×0.25	QBK-7056
265	Tension Rod Assy., Left	QXM-0016
266	FF. Lever, Left	QML-0093
267	Washer, Fiber 6.2×11×0.25	QBK-7056
268	Stop Ring E5φ	QNS-504T3
269	Stop Ring E3φ	QNS-304T3
270	Tension Rod Assy., Right	QXM-0015
271	FF. Lever, Right	QML-0094
272	Slide Cam Assy., Upper	QXH-0015
273	Slide Cam Assy., Middle	QXH-0014
274	Slide Cam Assy., Lower	QMF-1072
275	Stop Ring E3φ	QNS-304T3
276	Rod, Instant Stop	QMF-1117
277	Stop Ring E3φ	QNS-304T3
278	Brake Shifter, Left	QXL-0098
279	Brake Shifter, Right	QXL-0099
280	Shaft, Tension Arm	QMS-1190
281	Shaft, Tension Roller Guide	QMS-1189
282	Lever, Instant Stop	QXL-0092
283	Screw, —M3φ×5	QHN-230×5U3
284	Washer, Spring SW3φ	QWS-302U3
285	Plate, Micro Switch Holding	QMA-1100-1
286	Screw, —3φ×5	QHM-230×5U3
287	Washer, Lock L3φ	QWG-302K3
288	Metal, Instant Stop Lever	QMF-1151
289	Stop Ring E5φ	QNS-504T3
290	Washer, Fiber 6.2×11×0.5	QBK-7003
291	Felt, Panel Supporter	—
292	Panel Supporter	QMA-1140
293	Screw, —M3φ×5	—
294	Screw, —M3φ×6	QHM-230×6U3
295	Washer, Lock L3φ	QWG-302K3
296	Screw, —	—
297	Stop Ring, E5φ	QNS-504T3
298	Washer, Fiber 6.2×11×0.5	QBK-7003
299	Reverse Rod	QMR-1034
300	Base Plate, Lower	QXK-1051
301	Washer, Spring SW4φ	QWS-402U3
302	Nut, Hex., N4φ	QNS-404T3
303	Screw, —M3φ×5	QHM-230×5U3
304	Washer, Spring SW3φ	QWS-302U3
305	Angle, Trimmer	QTT-1184-1
306	Screw, —M3φ×5	QHM-230×5U3
307	Washer, Spring SW3φ	QWS-302U3
308	Retainer, Operating Shaft	QMA-1068
309	Washer, Spring SW4φ	QWS-402U3
310	Screw, —M4φ×5	QHN-240×5U3
311	Lever Assy., Control	QXL-0095
312	Washer, Fiber 6.2×11×0.5	QBK-7003
313	Stop Ring E5φ	QNS-504T3
314	Washer, Fiber 6.2×12×1	QBK-7040
315	Rod Assy., F/R	QXM-0017

Ref. No.	Description	Parts No.
1-11	Lid Ornament	QGK-1069
2	Lid Assy., Right (w/o Speaker)	QYJ-0021-1
3	Case, Main Body, Assy.	QYJ-0022
3-1	Handle, Assy.	QYH-16
3-2	Base, Handle Holding	QKT-1162
3-3	Screw, +M5 ϕ ×20	QHM-250×20CL1
3-4	Lid, Assy., Storage Pocket	QKD-1016B
3-5	Hinge, Left-1	QKC-1020
3-6	Hinge, Left-2	QKC-1008
3-7	Hinge, Right-1	QKC-1021
3-8	Hinge, Right-2	QKC-1009
3-9	Retainer, Boss	QMQ-1036-1
3-10	Trim Strip	QGB-1109
3-11	Cover, Motor	QGC-1014
4	Knob Assy., Volume Control	QYT-0045
5	Panel Assy., Amplifier	QYP-0068
6	Screw, +M3 ϕ ×23	QHV-230×25C1
7	Screw, +M3 ϕ ×12	QHV-230×12C1
8	Panel Assy., Mechanism	QYP-0069
9	Knob, Lever	QGT-2023
10	Head Cover, Assy.	—
11	Screw, +M3 ϕ ×12	QHM-230×12N1
12	Knob, Speed Selector	QYT-0046
13	Knob, Instant Stop	QGT-2009B
14	Screw	QHQ-1004
15	—	—
16	Washer, Flat	QWP-3012N1
17	Screw, Tapping +M3 ϕ ×16	QHB-530×16U3

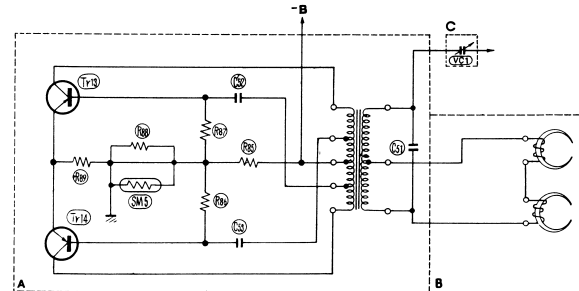
EXPLANATION ON CIRCUITS

1. PLAYBACK AMPLIFICATION CIRCUIT



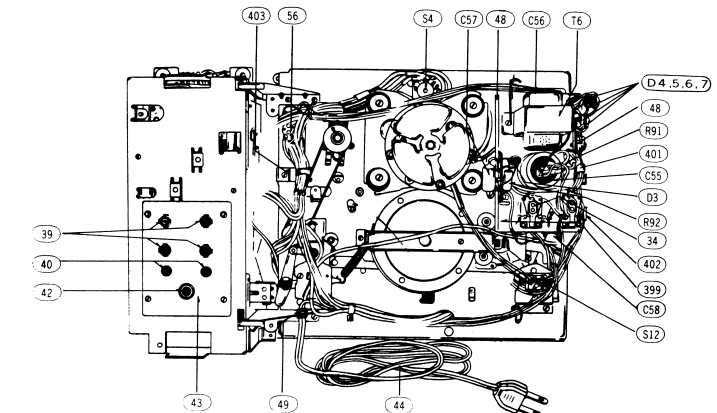
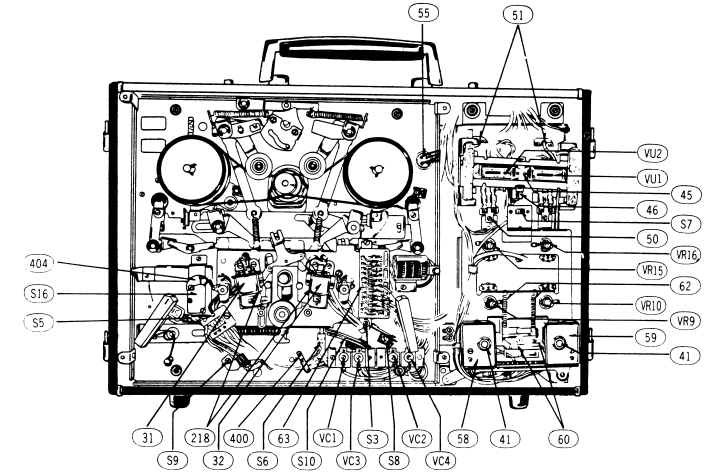
- A Playback Head
B Front Amplification Circuit
C Playback Equalizing Circuit
D Volume Control Circuit
E Tone Control Circuit
F Main Amplification Circuit
G Negative Feedback Amplification Circuit
H Output Circuit
VR9 for volume control
VR11 for adjustment of volume level between normal forward and reverse
S6-1 Stop Switch ("ON" when stopping)
S7 Stereo/Monaural Changeover Switch
C36, R53: Circuit for Transfer Track

2. OSCILLATION CIRCUIT



- A Oscillation Circuit
B Erase Head
C Circuit for Adjustment of Record Current

ELECTRICAL PARTS LOCATION

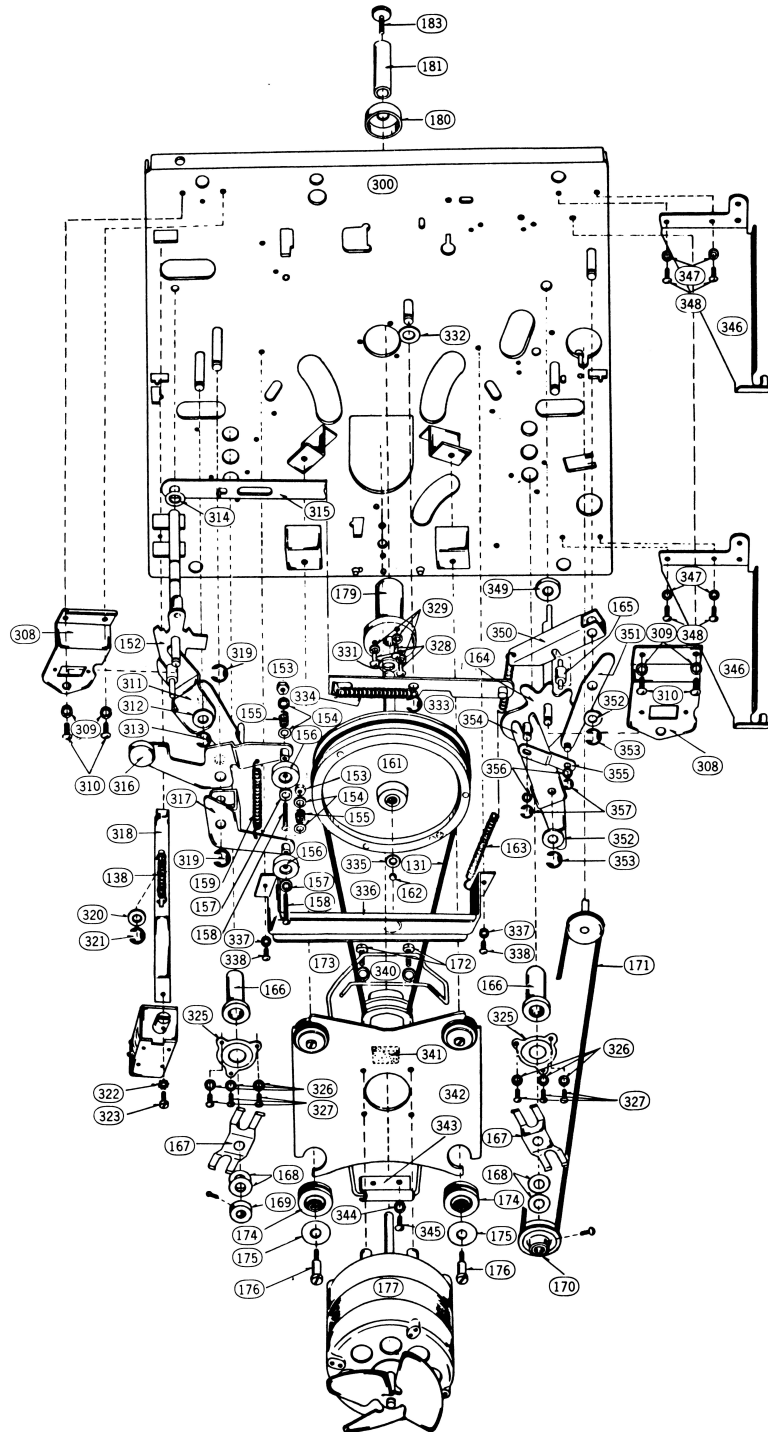


ACCESSORIES

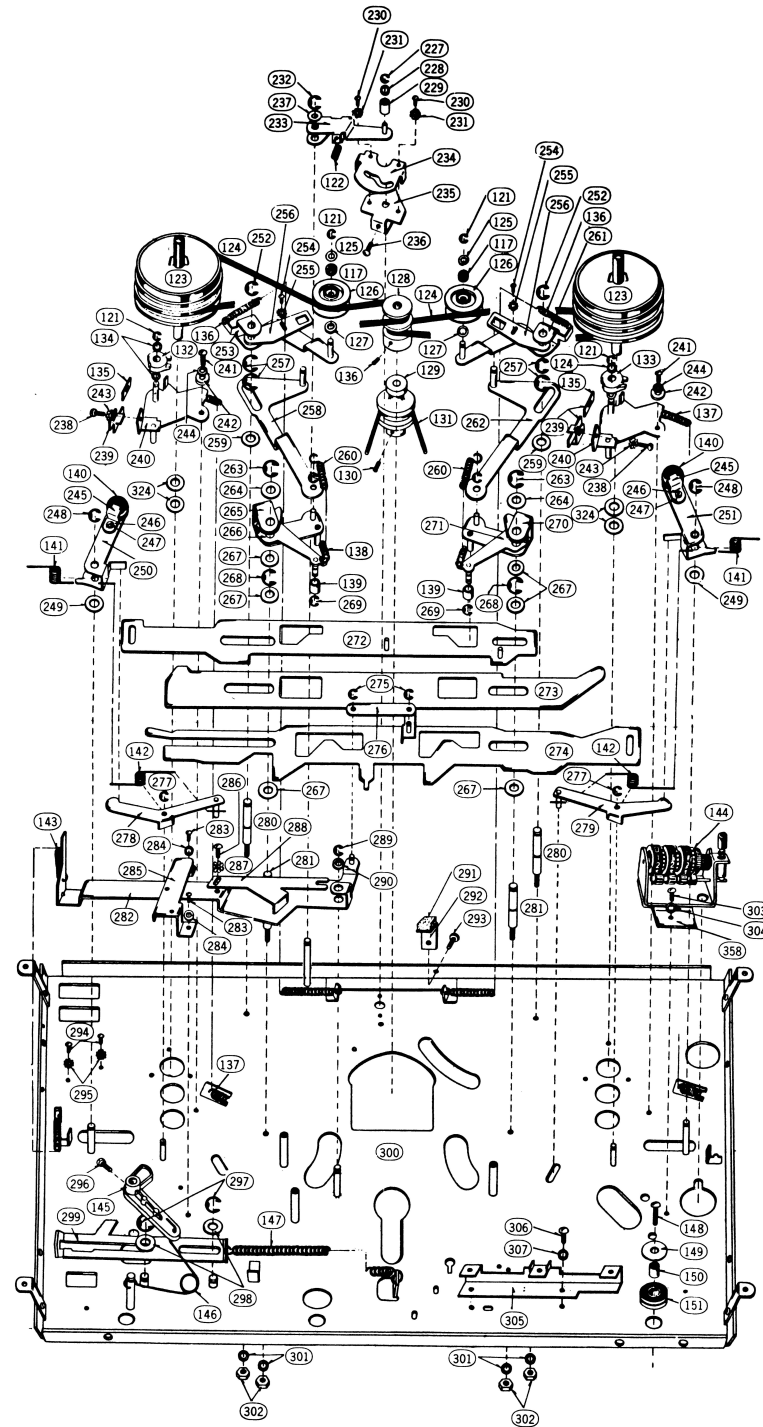
411	Reel, Empty, 7"	QFR-71NZ
412	Microphone, Dynamic	WM-2052N
413	Stand, Microphone	WN-105N
414	Cord-C, Connection	QEB-14P-1
415	Reel Holder	QBG-1030-1
416	Sensing Foil	QFS-0004
417	Cover, Dust	QFD-0069
418	Book, Instruction	QQT-1016
419	Cord-D, Connection	QEB-29P
420	Tape, Recording, 7"	QFT-71NR62Z
421	Tape, Splicing	QFS-2-1
422	Plug, Stereophone	QJP-203-1
423	Plug-B	QJP-0601
424	Plug-C	QJP-0602

PACKING

431	Case, Packing	QPN-1414
432	Cushion-A	QPN-1382-A
433	Polysheet	QPQ-1013
434	Cushion	QPN-1417

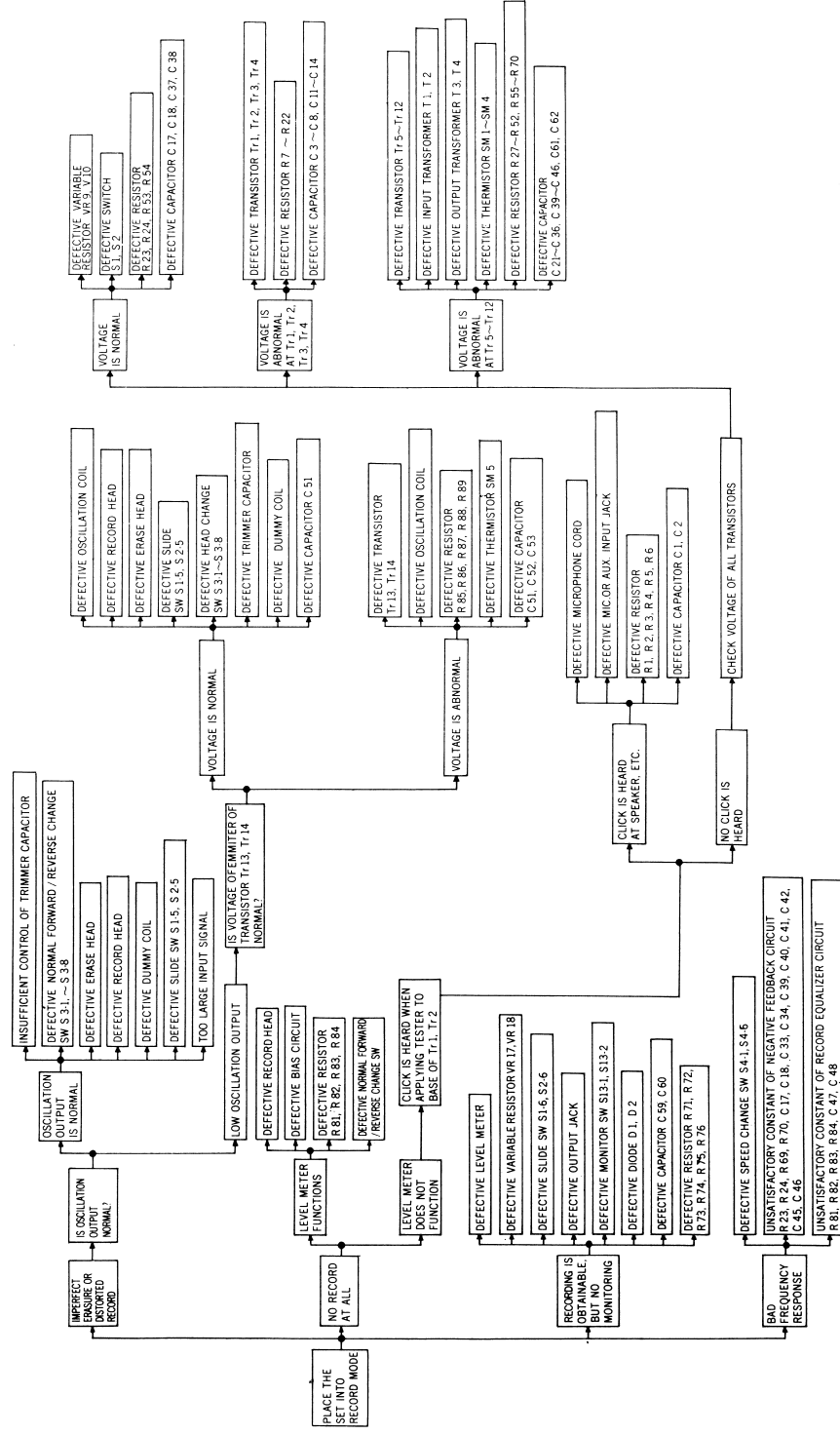


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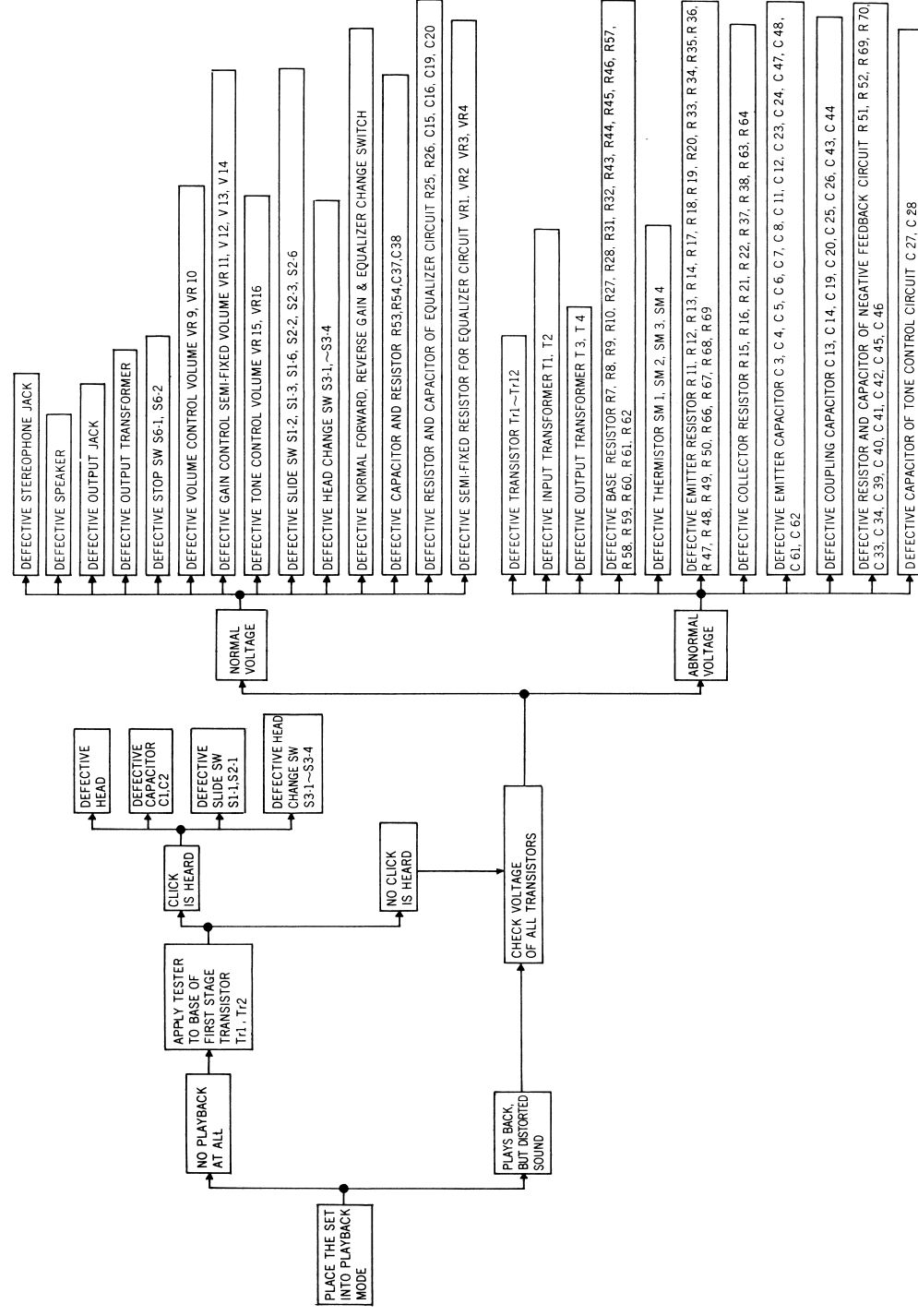


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TRUBLE SHOOTING GUIDE 1



TROUBLE SHOOTING GUIDE 2

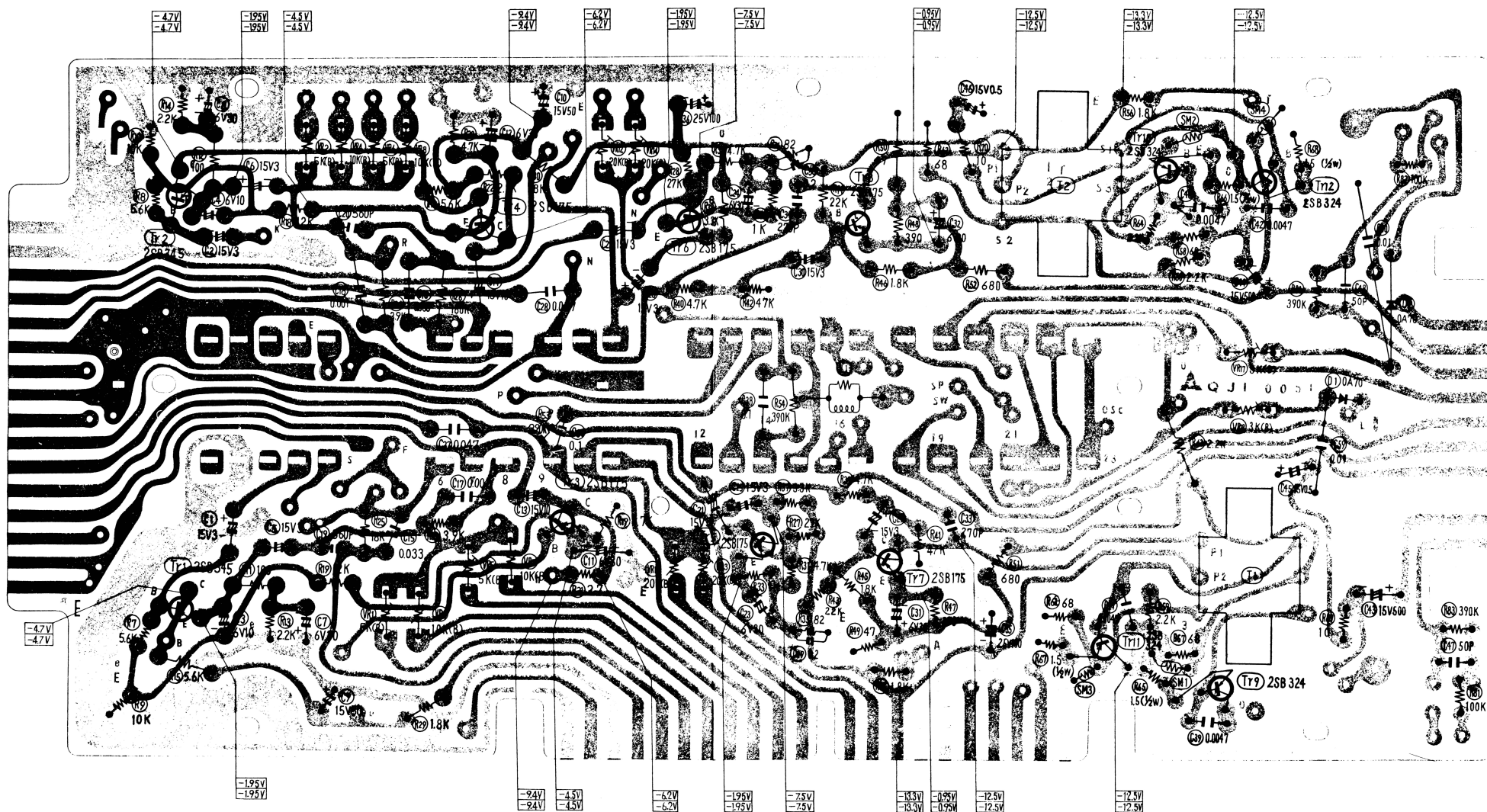


N31-18.



- | | | | | | |
|-----------------------------|---|-----------------------|---|---|-----------------------------|
| 1. S1-1~S1-7, S2-1~S2-7 ... | Record/Playback Selector Switch
(Shown in Stereo Playback Position) | 8. S10 | Relay Switch (Stop, Rewind, FF ON) | 15. S17 | Discharge Protection Switch |
| 2. S3-1~S3-8 | Head Change Switch | 9. S11 | Power ON/OFF Switch (Coupled with VR10) | 16. S18-1~S18-2 | Voltage Selector Switch |
| 3. S4-1~S4-6 | Speed Selector Switch | 10. S12-1~S12-2 | Motor Rotation Selector Switch | 17. Values indicated in <input type="checkbox"/> are DC to chassis ground with no signal applied. | |
| 4. S5-1~S5-4 | F/R Gain Change Switch | 11. S13-1~S13-2 | Monitor Switch (Coupled with VR15, VR16) | 18. The upper values should be measured during playback and the lower values during recording. | |
| 5. S6-1~S6-2 | Stop Switch | 12. S14 | Reverse Switch (Coupled with Relay-2) | 19. All Resistance in Ω . K=1,000 Ω , M=1,000,000 Ω . | |
| 6. S7 | Stereo/Monaural Selector Mixing Switch | 13. S15 | Shut Off Switch (Coupled with Relay-1) | 20. All Capacitance in Micro Farads. P=Micro-microfarads. | |
| 7. S8~S9 | Plunger Switch
(S8 Stop, Rewind, FF OFF)
(S9 Reverse OFF) | 14. S16 | Motor ON/OFF Switch (Controlled with Pinch Roller action) | | |

N31-20.



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

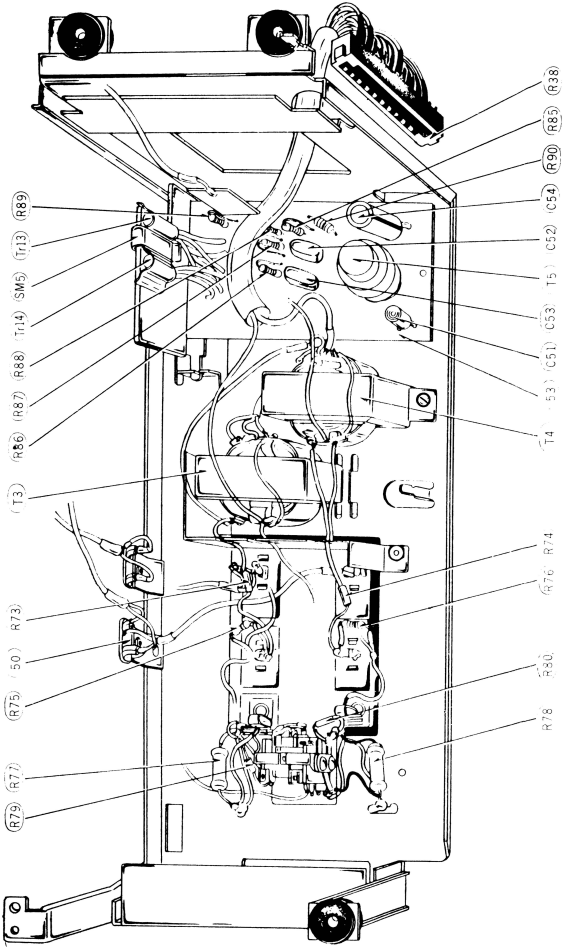
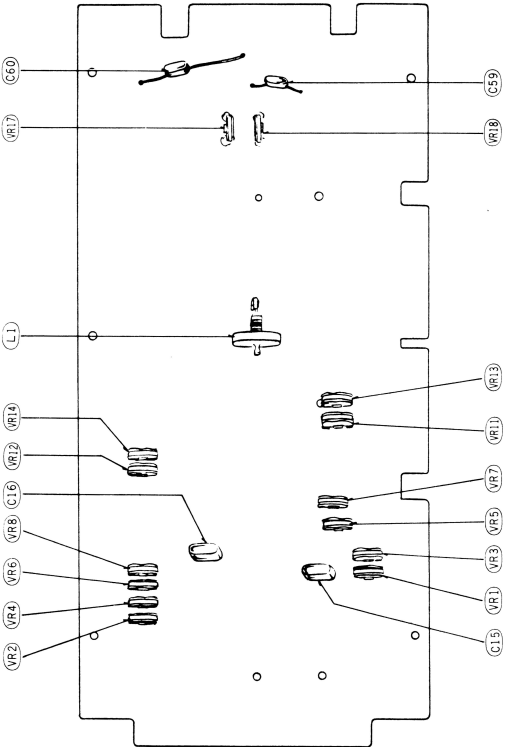
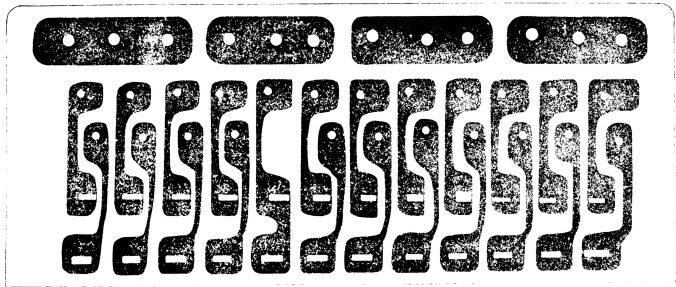
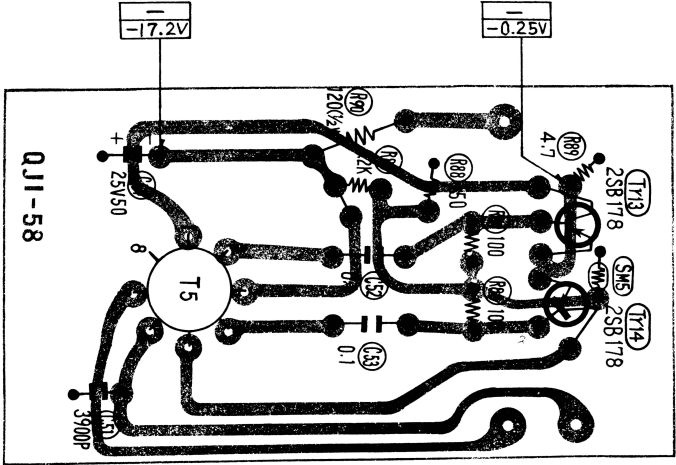
CIRCUIT BOARD

ELECTRICAL PARTS LOCATION

CIRCUIT BOARD

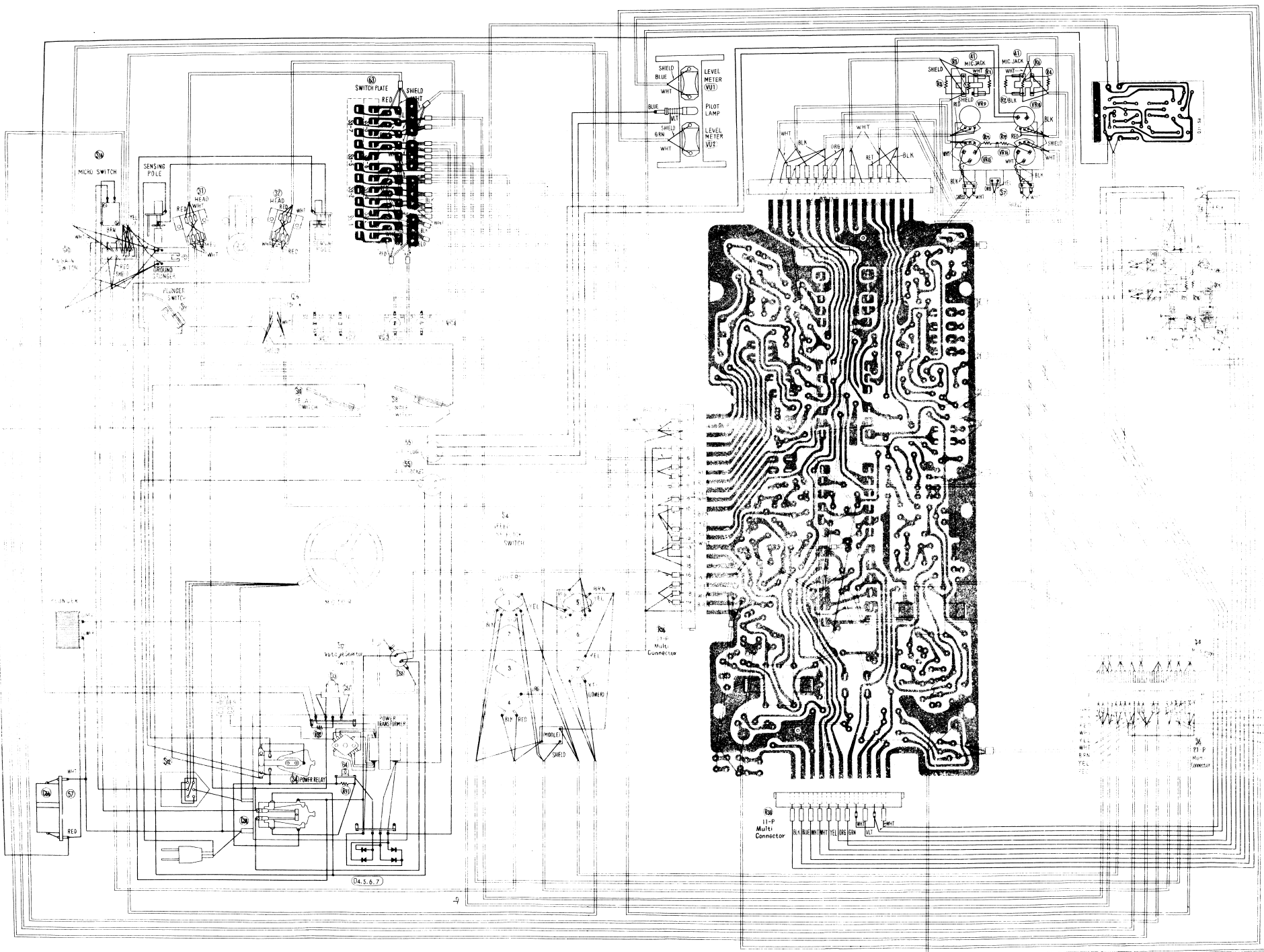
ELECTRICAL PARTS LOCATION

CONDUCTOR SIDE



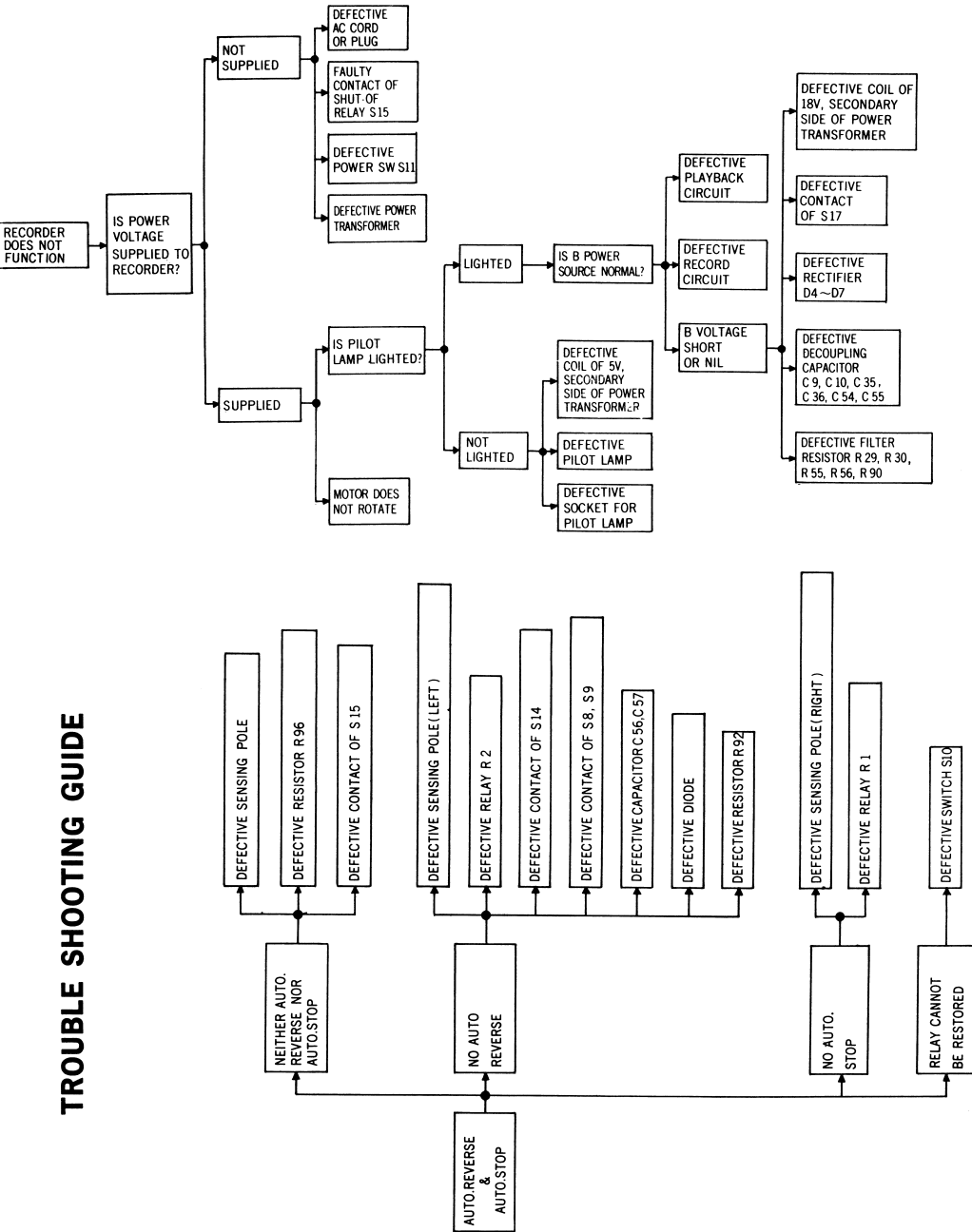
NOTE:
Values indicated in are DC to chassis ground with no signal applied.
The upper values should be measured during playback and the lower values during recording.

NATIONAL MODEL RS-776S

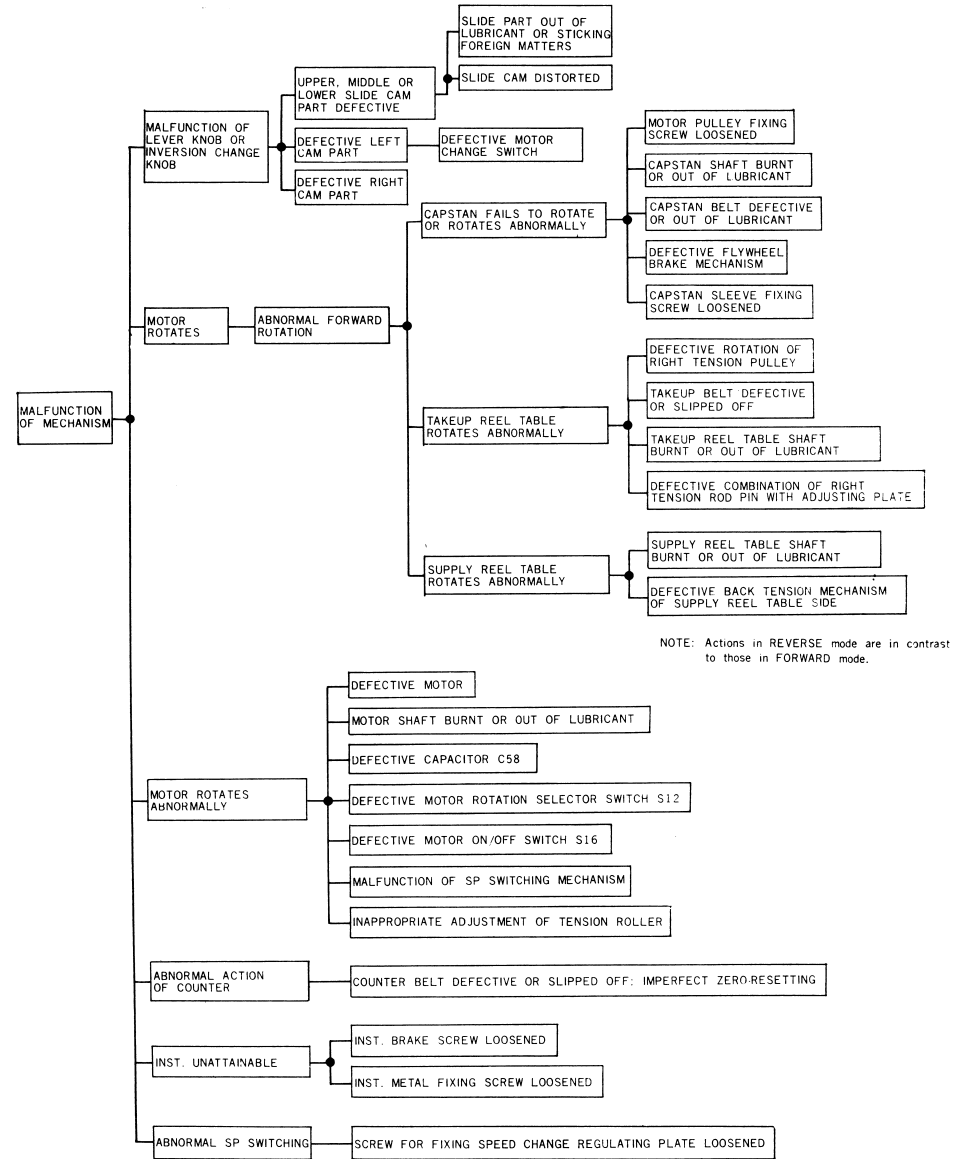


N31-17. NATIONAL MODEL RS-776S

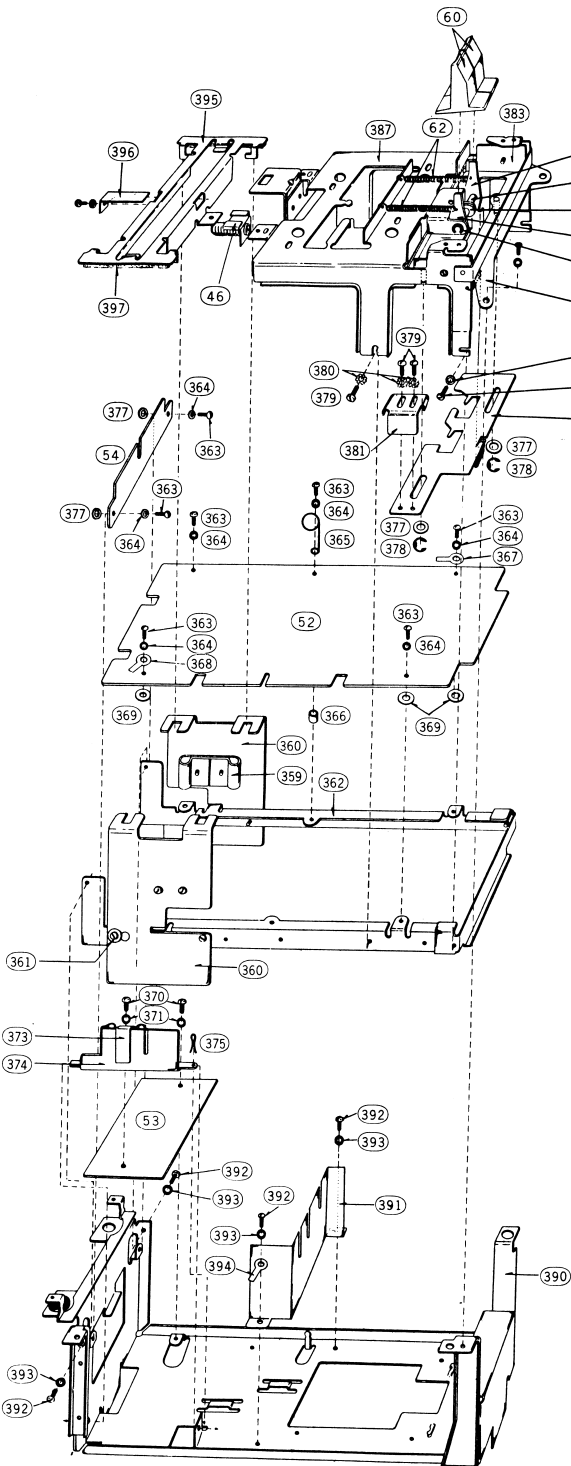
TRUBLE SHOOTING GUIDE



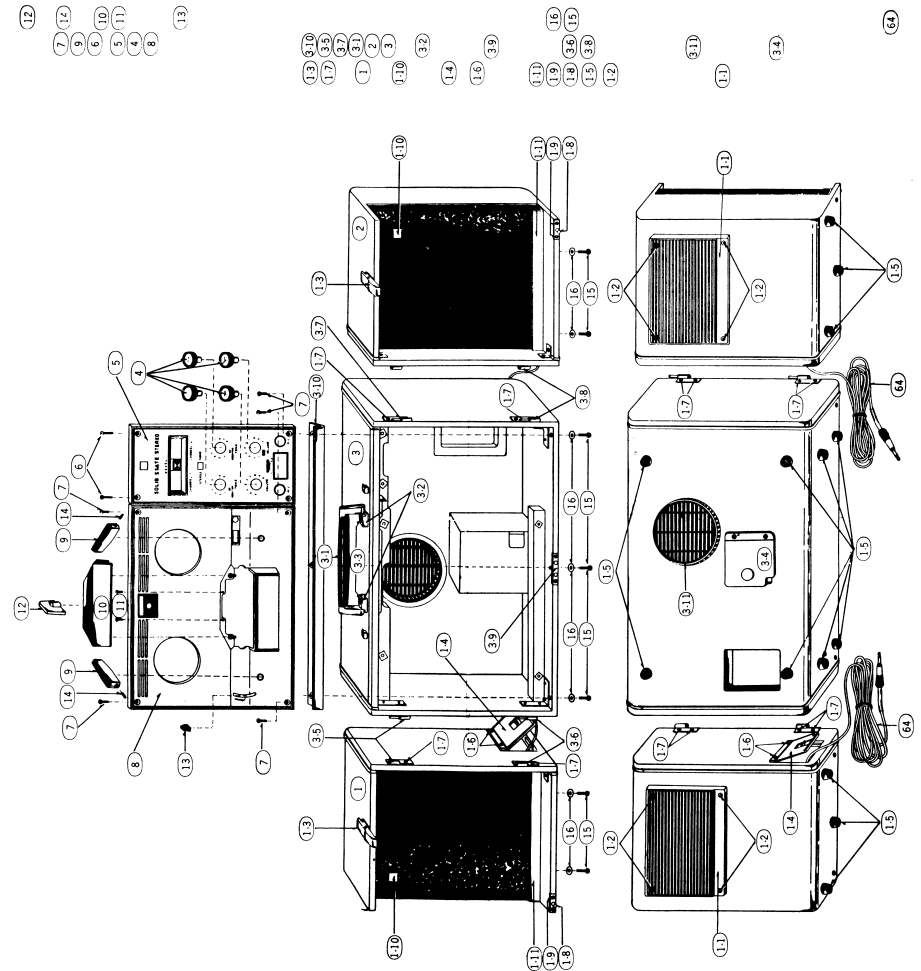
TRUBLE SHOOTING GUIDE



CABINET PARTS

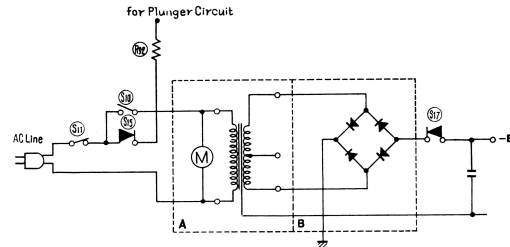


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N31-13. NATIONAL MODEL RS-776S

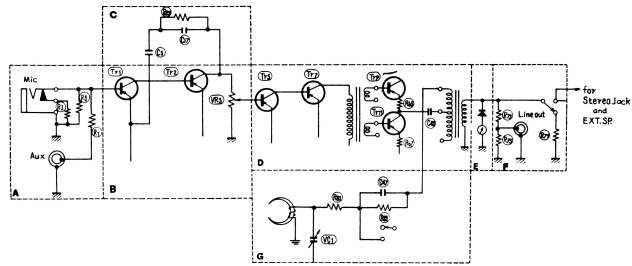
3. AC POWER CIRCUIT



A Power Transformer
B Rectification Circuit

S11 Power Switch (Interlocking with Tone Control Volume)
S10, S15, S17 ... Switch for Sensing Operation (Refer to 5. Sensing Circuit)

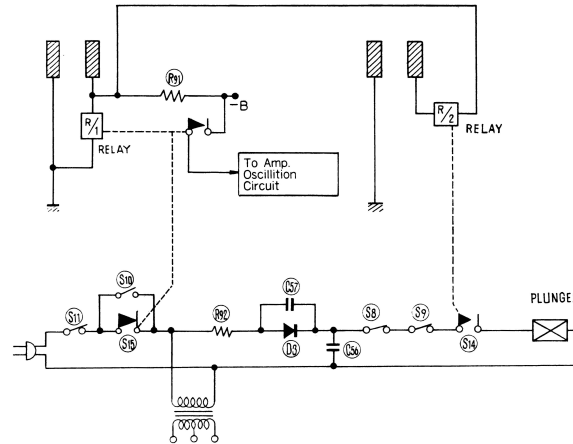
4. RECORD CIRCUIT



A Input Circuit
B Front Amplification Circuit
C Negative Feedback Circuit
D Main Amplification Circuit

E Level Meter Circuit
F Monitor Circuit
G Record Equalization Circuit & Record Head

5. CIRCUIT FOR AUTOMATIC REVERSE & AUTOMATIC STOP



S8, S9 Switch for Retention of Plunger
S8 "OFF" when the set is in STOP, FF. & REW. modes.
S9 "OFF" when the set is in REVERSE mode.
S10 Switch for Restoration of Relay. ("ON" when the set is in STOP, FF., & REW. modes)
S11 Power Switch (Interlocking with Tone Control Volume)
S14 Relay for reversing (R2)
S15 Relay for shutting off (R1)
S17 Relay for prevention from electric discharge (R1)

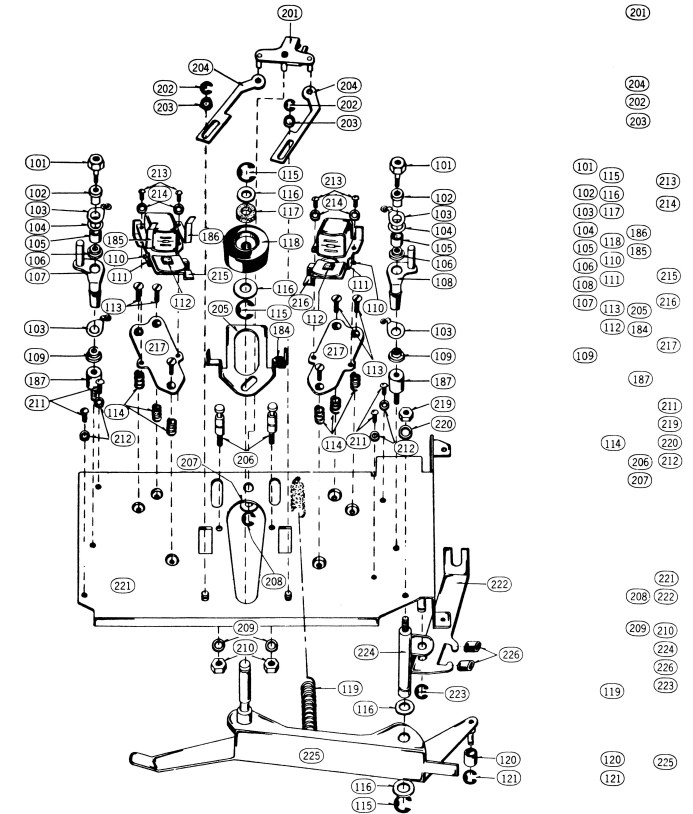
* Operation of Relay for reversing.

When the Left Sensing Pole short-circuits, -B flows on the Relay, making the S14 and the plunger function for reversing.

* Shut-off Operation

When the Right Sensing Pole short-circuits, the current at the Relay R1 becomes nil, and makes the S15 open, switching the Power Source off.
When the lever is placed into the position of "OFF", the S10 is shut off, switching the Power Source on.

EXPLODED VIEWS



N31-11.

NATIONAL MODEL RS-776S

Ref. No.	Description	Parts No.	Ref. No.	Description	Parts No.
316 Brake Arm-A Assy., Flywheel	QXA-0038-2	368 Lug, Wire Holding	QTD-1001
317 Brake Arm-B Assy., Flywheel	QXA-0039-2	369 Washer, Fiber	QBK-7078
318 Rod, Plunger	QMR-1033	370 Screw, —M3φ×6	QHM-130×6U3
319 Stop Ring E5φ	QNS-504T3	371 Washer, Spring SW3φ	QWS-302U3
320 Washer, Fiber 4.2×8×0.5	QBK-7006	372 —	—
321 Stop Ring E3φ	QNS-304T3	373 Cap, Heat Sink	QTH-1001
322 Washer, Lock L4φ	QWG-402K3	374 Heat Sink, Oscillator	QTH-1017-2
323 Screw, —M4φ×12	QHM-240×12U3	375 Pin, Stopper	QNP-116×8U3
324 Washer, Back Tension	QBJ-1132	376 Rod, Ganging	QMR-1036
325 Holder, Reel Table Metal	QMQ-1028	377 Washer, Fiber 3φ	QBK-7078
326 Washer, Spring SW3φ	QWS-302U3	378 Stop Ring, E3φ	QNS-304T3
327 Screw, —M3φ×5	QHM-230×5U3	379 Screw, —M3φ×6	QHM-130×6U3
328 Screw, —M4φ×8	QHM-240×8U3	380 Washer, Lock L3φ	QWG-302K3
329 Washer, Spring SW4φ	QWS-402U3	381 Rod-B, Gang	QMR-1047
330 —	—	382 Washer, Spring SW3φ	QWS-302U3
331 Washer, Thrust	QBJ-3011	383 Angle, Ganging Rod	QMA-1073
332 Washer, Fiber 6.2×11×0.5	QBK-7003	384 Lever-A Gang	QML-1168
333 Stop Ring E5φ	QNS-504T3	385 Lever-B Gang	QML-1169
334 Spring, F/R Rod	QBT-1155	386 Stop Ring E3φ	QNS-304T3
335 Retainer Thrust	QMQ-1004-2	387 Angle Assy., Upper	QEL-1014
336 Plate, Flywheel Cushion	QMF-1113	388 Washer, Fiber	QBK-7004
337 Washer, Spring SW3φ	QWS-302U3	389 Shaft, Recording Lever	QMS-1148
338 Screw, —M3φ×5	QHM-230×5U3	390 Base Plate, Main	QTC-1026-2
339 —	—	391 Plate, Cross Talk Shield	QTS-1071
340 Washer, Spring SW4φ	QWS-402U3	392 Screw, —M3φ×6	QHM-130×6U3
341 Felt-B, Belt Shifter	QBF-1076	393 Washer, Spring SW3φ	QWQ-302U3
342 Base, Motor	QXK-1049	394 Lug-A, Wire Holding	QTD-1002
343 Retainer, Belt Shifter	QAS-1032	395 Angle, VU Meter	QTT-1183
344 Washer, Spring SW3φ	QWS-302U3	396 Pusher, VU Meter	QBJ-1120
345 Screw, —M3φ×5	QHM-230×5U3	397 Spacer, VU Meter Angle	QBJ-1120
346 Angle, Amp. Holding	QMA-1098	398 Plate, Shield	QTS-1049
347 Washer, Spring SW3φ	QWS-302U3	399 Base Plate, Power	—
348 Screw, —M3φ×5	QHM-230×5U3	400 Clamper-B, Wiring	—
349 Washer, Main Cam	QWQ-1015-1	401 Clamper, Wiring	QTD-1111
350 Clicker	QML-1040	402 Clamper-A, Capacitor	QTD-1144
351 Lever Assy., Recording Gang	QXL-0091	403 Plate Assy., Cord Holding	QTD-1206-1
352 Washer, Fiber 4.2×8×0.5	QBK-7006	404 Washer, Micro Switch	QBK-1056
353 Stop Ring E5φ	QNS-504T3			
354 Lever Assy., Control	QXL-0095			
355 Rod-A, Recording	QMR-1035			
356 Washer, Fiber 6.2×11×0.5	QBK-7003			
357 Stop Ring E3φ	QNS-304T3			
358 Base Plate, Counter	QMA-1067-1			
359 Band, Heat Sink	QTT-1119			
360 Plate, Heat Sink	QTH-1016-1			
361 Washer, Flat W3φ	QWP-3012U3			
362 Angle Assy., Base Plate	QEL-1013			
363 Screw, —M3φ×6	QHM-130×6U3			
364 Washer, Spring SW3φ	QWS-302U3			
365 Spring, Wiring	QTD-1121			
366 Spacer-B	QTW-1004			
367 Lug-A, Wire Holding	QTD-1002			

CABINET PARTS

1 Lid Assy., Left (w/o Speaker)	—
1-1 Grill	Q GK-1010
1-2 Wood Screw, +MS3.1×16	QHV-431×16V1
1-3 Lock Hinge	QKL-1009
1-4 Lid, Assy., Accessory Pocket	QYF-0019
1-5 Foot, Rubber	QKA-1036
1-6 Wood Screw, +M3.1×10	QHM-431×10V1
1-7 Wood Screw, +M3φ×10	QHV-230×10C1
1-8 Boss	QMB-1005
1-9 Wood Screw, +MS2.4φ×13	QHV-424×13V1
1-10 Mark, NATIONAL	—

MECHANICAL PARTS

Ref. No.	Description	Parts No.
101	Screw, Tape Guide	QAG-1035
102	Pipe, Insulation (Upper)	QBJ-1094
103	Terminal, Tape Guide	QJT-0014
104	Washer, Tape Guide	QAG-1048
105	Tape Guide-A	QAG-1049
106	Washer, Tape Guide-B	QRJ-1095
107	Plate, Assy., Tape Guide, Left	QAG-1101-1
108	Plate, Assy., Tape Guide, Right	QAG-1102-1
109	Pipe, Insulation (Large)	QBJ-1096
110	Spindle, R/P Pad	QAP-1014
111	Spring, R/P Pad	QAP-1123
112	Felt, Pad	QAP-1066
113	Screw, S3 ϕ ×10	QHS-130×10U3
114	Spring, Head Adjust	QBC-1066
115	Stop Ring, E5 ϕ	QNS-504T3
116	Washer, Fiber, 6.2×11×0.5	QBK-7003
117	Felt, Pinch Roller	QBF-1022
118	Pinch Roller	QDP-1015
119	Spring, Pinch Roller	QBT-1091
120	Roller	QDP-1015
121	Stop Ring, E3 ϕ	QNS-304T3
122	Spring, Speed Change	QBT-1157
123	Reel Table Assy.	QXP-0145-1
124	Belt, Takeup	QDB-0035
125	Washer, Fiber, 4.2×8×1.5	QBK-7052
126	Roller, Tension	QDP-1071
127	Washer, Fiber, 4.2×9×0.5	QBK-7005
128	Pulley-A, Motor	QXP-0146-1
129	Pulley-B, Motor	QXP-0150
130	Screw, -40 ϕ ×10	QHP-840×10U3
131	Belt, Capstan	QDB-0033
132	Brake Assy., Left	QUV-1016
133	Brake Assy., Right	QUV-1015
134	Washer, Fiber, 4.0×10×0.5	QBK-7009
135	Brake Shoe, Instant Stop	QBG-1016
136	Spring, Tension Arm	QBT-1123
137	Spring, Brake	QBC-1040
138	Spring, Plunger Rod	QBT-1163
139	Roller-B	QDP-1100
140	Brake Shoe	QBG-1060
141	Spring, Reverse Brake	QBN-1026-1
142	Spring, Brake Shifter	QBN-1027
143	Spring, Instant Stop Lever	QBT-1154
144	Tape Counter	QDC-0012
145	Lever, Instant Stop	QML-1253
146	Spring, Instant Stop	QBN-1028
147	Spring, Reverse Rod	QBT-1093
148	Screw, +M4 ϕ ×20	QHM-240×20U3
149	Washer Flat	QWQ-1003

Ref. No.	Description	Parts No.
150	Pipe	QKT-1028
151	Rubber Cushion	QBG-1019
152	Cam Assy., Left	QXH-0016-1
153	Nut, Hex., N3 ϕ	QNN-3022U3
154	Spring, Washer	QWQ-1070
155	Spring, Brake Rubber Roller	QBC-1050
156	Flywheel Rubber	QBG-1087
157	Washer, Brake Roller	QWQ-1078
158	Screw, Flywheel Brake	QHQ-1083
159	Spring, Flywheel Brake	QBT-1156
161	Flywheel, Assy.	QXF-0016-1
162	Thrust Ball	QDK-1003
163	Spring, Clicker	QBT-1158-1
164	Cam Assy., Right	QXH-0017-1
165	Roller, Click	QDP-1018-1
166	Bearing, Reel Table	QMM-1089
167	Spring, Back Tension	QBP-1075-1
168	Washer, Back Tension	QBJ-1132
169	Metal, Back Tension	QNQ-1045
170	Pulley, Tape Counter	QDP-1021
171	Belt, Tape Counter	QDB-0034
172	Screw, -M4 ϕ ×5	QHM-140×5U3
173	Shifter, Assy., Belt	QXL-0100
174	Rubber Cushion, Motor	QBG-1086
175	Retainer, Motor Rubber	QMF-1118
176	Screw, Motor Holding	QHG-1066
177	Motor	4KC-20AA
177	Motor	4KC-20AB
177	Motor	4KC-20AC
178	—	—
179	Retainer, Capstan Shaft	QYQ-0046
180	Oil-cap, Capstan	QBJ-1098-1
181	Capstan Sleeve-A, 60 cps.	QMS-1192-1
181	Capstan Sleeve-B, 60 cps.	QMS-1235-1
181	Capstan Sleeve-C, 60 cps.	QMS-1238-1
183	Screw, Capstan Sleeve Holding	QHQ-1006
184	Rubber, Pad Shifter	QBG-1102
187	Base, Tape Guide	QAG-1053
188	Tape Guide-B	QAG-1106
201	Shifter-C Assy., Pad	—
202	Stop Ring, E3 ϕ	QNS-304T3
203	Washer, Fiber 4.2×8×0.5	QBK-7006
204	Shifter-A Assy., Pad	QAS-1007
205	Shifter-B Assy., Pad	QAS-1013
206	Tape Limiter	QAG-1052
207	Washer, Fiber 4.2×9×0.25	QBK-7007
208	Stop Ring, E3 ϕ	QNS-304T3
209	Washer, Spring SW3 ϕ	QWS-302U3
210	Nut, Hex., N3 ϕ	QNN-3022U3
211	Screw, -M3 ϕ ×5	QHM-130×5U3

REPLACENT PARTS LIST

ATTENTION : Parts which are not listed are part of an assembly and are not stocked as a separate item.
To obtain parts not listed, order the entire assembly.

RESISTORS

Ref. No.	Description	Parts No.
R1, R2	Resistor, 1/4 W, 1.5 MΩ	ERD-14PZK155
R3, R4, R5, R6	Resistor, 1/4 W, 22 KΩ	ERD-14TK223
R7, R8	Resistor, 1/4 W, 5.6 KΩ	ERD-14VK562
R9, R10	Resistor, 1/4 W, 10 KΩ	ERD-14VK103
R11, R12	Resistor, 1/4 W, 100Ω	ERD-14VK101
R13, R14	Resistor, 1/4 W, 2.2 KΩ	ERD-14VK222
R15, R16	Resistor, 1/4 W, 5.6 KΩ	ERD-14VK562
R17, R18	Resistor, 1/4 W, 12 KΩ	ERD-14VK123
R19, R20	Resistor, 1/4 W, 4.7 KΩ	ERD-14VK472
R21, R22	Resistor, 1/4 W, 2.7 KΩ	ERD-14VK272
R23, R24	Resistor, 1/4 W, 3.9 KΩ	ERD-14VK392
R25, R26	Resistor, 1/4 W, 180 KΩ	ERD-14VK184
R27, R28	Resistor, 1/4 W, 27 KΩ	ERD-14VK273
R29, R30	Resistor, 1/4 W, 1.8 KΩ	ERD-14VK182
R31, R32	Resistor, 1/4 W, 4.7 KΩ	ERD-14VK472
R33, R34	Resistor, 1/4 W, 1 KΩ	ERD-14VK102
R35, R36	Resistor, 1/4 W, 82Ω	ERD-14VK820
R37, R38	Resistor, 1/4 W, 3.3 KΩ	ERD-14VK332
R39, R40	Resistor, 1/4 W, 4.7 KΩ	ERD-14VK472
R41, R42	Resistor, 1/4 W, 47 KΩ	ERD-14VK473
R43, R44	Resistor, 1/4 W, 22 KΩ	ERD-14VK223
R45, R46	Resistor, 1/4 W, 1.8 KΩ	ERD-14VK182
R47, R48	Resistor, 1/4 W, 390Ω	ERD-14VK391
R49, R50	Resistor, 1/4 W, 47Ω	ERD-14VK470
R51, R52	Resistor, 1/4 W, 680Ω	ERD-14VK681
R53, R54	Resistor, 1/4 W, 390 KΩ	ERD-14VK394
R55, R56	Resistor, 1/4 W, 1.8 KΩ	ERD-14VK182
R57, R58	Resistor, 1/4 W, 68Ω	ERD-14VK680
R59, R60	Resistor, 1/4 W, 2.2 KΩ	ERD-14VK470
R61, R62	Resistor, 1/4 W, 68Ω	ERD-14VK680
R63, R64	Resistor, 1/4 W, 2.2 KΩ	ERD-14VK222
R65, R66, R67, R68	Resistor, 1/2 W, 1.5Ω	ERW-12R1R5
R69, R70	Resistor, 1/4 W, 10Ω	ERD-14VK100
R71, R72	Resistor, Solid 1/2 W, 10Ω	ERC-12GK100
R73, R74	Resistor, Solid 1/2 W, 100Ω	ERC-12GM101
R75, R76	Resistor, 1/4 W, 47Ω	ERD-14TK470
R77, R78	Resistor, Solid 1/2 W, 10Ω	ERC-12GK100
R79, R80	Resistor, 1/4 W, 120Ω	ERD-14TK121

Ref. No.	Description	Parts No.
R81, R82	Resistor, 1/4 W, 100 KΩ	ERD-14VK104
R83, R84	Resistor, 1/4 W, 390 KΩ	ERD-14VK394
R85	Resistor, 1/4 W, 8.2 KΩ	ERD-14VK822
R86, R87	Resistor, 1/4 W, 100Ω	ERD-14VK101
R88	Resistor, 1/4 W, 150Ω	ERD-14VK151
R89	Resistor, 1/4 W, 4.7Ω	ERD-14VK4R7
R90	Resistor, Solid 1/2 W, 120Ω	ERC-12GFM121
R91	Resistor, Solid 2 W, 150Ω	ERC-2GK151
R92	Resistor, Fusible 2 W, 8Ω	ERU-2P8R0

VARIABLE RESISTORS

VR1, VR2	Resistor, Semi-fixed Variable, 5 KΩ-B	QVL-TOAA00B53
VR3, VR4	Resistor, Semi-fixed Variable, 10 KΩ-B	QVL-TOAA00B14
VR5, VR6	Resistor, Semi-fixed Variable, 5 KΩ-B	QVL-TOAA00B53
VR7, VR8	Resistor, Semi-fixed Variable, 10 KΩ-B	QVL-TOAA00B14
VR9	Resistor, Variable, 5 KΩ-A	EVC-BOAL25A53
VR10	Resistor, Variable, 5 KΩ-A	EVC-BOCL25A53
VR11, VR12, VR13, VR14	Resistor, Semi-fixed Variable, 20 KΩ-B	QVL-TOAA00B24
VR15, VR16	Resistor, Semi-fixed Variable, 20 KΩ-A	EVC-BOGL25A24
VR17, VR18	Resistor, semi-fixed Variable, 3 KΩ-B	QVL-TOAA00B33

CAPACITORS

C1, C2	Capacitor, Elec, Tubular, 3μF	ECE-A15V3
C3, C4	Capacitor, Elec, Tubular, 10μF	ECE-A6V10
C5, C6	Capacitor, Elec, Tubular, 3μF	ECE-A15V3
C7, C8	Capacitor, Elec, Tubular, 30μF	ECE-A6V30
C9, C10	Capacitor, Elec, Tubular, 50μF	ECE-A15V50
C11, C12	Capacitor, Elec, Tubular, 30μF	ECE-A6V30
C13, C14	Capacitor, Elec, Tubular, 10μF	ECE-A15V10
C15, C16	Capacitor, Mylar, 0.033μF	ECQ-M05333MZ
C17, C18	Capacitor, Mylar, 0.001μF	ECQ-M05102MZ
C19, C20	Capacitor, Polystyrene, 560PF	ECQ-S1561KZ
C21, C22	Capacitor, Elec, Tubular, 3μF	ECE-A15V3
C23, C24	Capacitor, Elec, Tubular, 30μF	ECE-A6V30
C25, C26	Capacitor, Elec, Tubular, 3μF	ECE-A15V3
C27, C28	Capacitor, Mylar, 0.047μF	ECQ-M05473MZ
C29, C30	Capacitor, Elec, Tubular, 3μF	ECE-A15V3
C31, C32	Capacitor, Elec, Tubular, 30μF	ECE-A6V30
C33, C34	Capacitor, Polystyrene, 270PF	ECQ-S1271KZ
C35, C36	Capacitor, Elec, Tubular, 100μF	ECE-A25V100
C37, C38	Capacitor, Mylar, 0.047μF	ECQ-M05473MZ
C39, C40, C41, C42	Capacitor, Mylar, 0.0047μF	ECQ-M05472MZ
C43, C44	Capacitor, Elec, Tubular, 500μF	ECE-A15V500
C45, C46	Capacitor, Elec, Tubular, 0.5μF	ECE-A15V0.5M
C47, C48	Capacitor, Ceramic, 50PF	ECC-D5500K
C49, C50	Capacitor, Mylar, 0.2μF	ECQ-M05204MZ
C51	Capacitor, Polystyrene, 3900PF	ECQ-S1392JZ
C52, C53	Capacitor, Mylar, 0.1μF	ECQ-M05104MZ

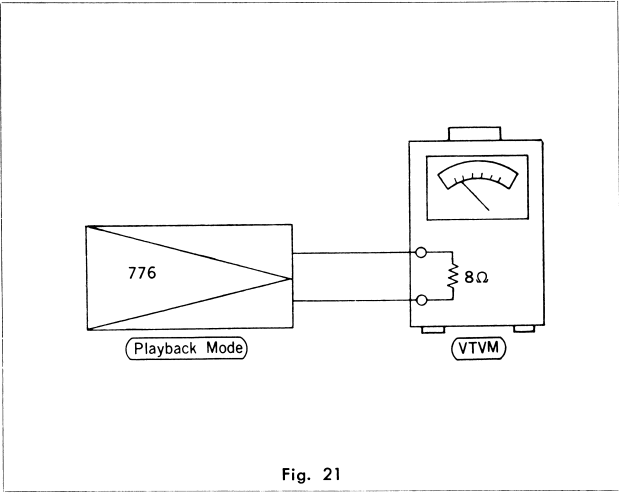
AMPLIFIER ADJUSTMENTS

PLAYBACK PERFORMANCE CHECKS AND ADJUSTMENTS

PLAYBACK FREQUENCY RESPONSE TEST

Instruments Required: VTVM, Standard Alignment Tape.
Measuring Circuit: Refer to Fig. 21.

1. Connect input of VTVM to Line Output Jack.
2. Put on Alignment Tape and play 700 cps reference tone (−10 db), adjust Volume Control for −5 dbm at VTVM.
3. Set Tone Control (VR15, VR16) at most appropriate position (nearly maximum position).
4. Using −5dbm on VTVM as a reference, play tape from 10 Kc to 100 cps (5 Kc to 100 cps for 3-3/4 ips speed) and note deviation from reference on VTVM. Tolerance ±6 db.



PLAYBACK LEVEL BALANCE CHECK

Instruments Required: VTVM, Standard Alignment Tape.
Measuring Circuit: Refer to Fig. 21.

1. Connect VTVM input to Line Output Jack.
2. Put on standard Alignment Tape and play 700 cps reference tone (−10 db), and set Level and Tone Controls at "maximum" positions. Difference of reading on the VTVM between channels should be within 3 db. Difference of reading on the VTVM between normal and reverse forward playback should be 3 db.

PLAYBACK FREQUENCY RESPONSE ADJUSTMENTS

1. Repeat steps (A) 1~4 as above and adjust the following controls for flat response

7-1/2 ips

Channel 1 VR5 (when in normal operation)
VR1 (when in reverse operation)

Channel 2 VR6 (when in normal operation)
VR2 (when in reverse operation)

3-3/4 ips

Channel 1 VR7 (when in normal operation)
VR3 (when in reverse operation)

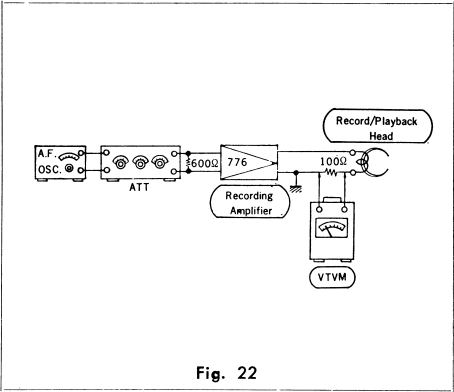
Channel 2 VR8 (when in normal operation)
VR4 (when in reverse operation)

PLAYBACK LEVEL BALANCE ADJUSTMENT

1. Repeat steps (C) 1 and 2.
2. Adjust following semi-fixed resistors to obtain 0.6~0.77 V reading on VTVM connected to the Line Output.

Channel 1 VR11 (when in normal operation)
VR13 (when in reverse operation)

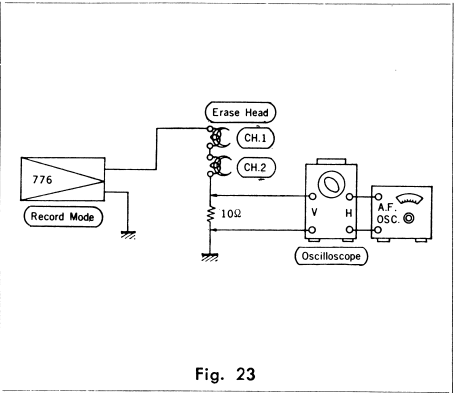
Channel 2 VR12 (when in normal operation)
VR14 (when in reverse operation)



RECORD LEVEL CALIBRATION

Instruments Required: AF Generator, Attenuator, VTVM, 600Ω and 100Ω Resistors.
Measuring Circuit: Refer to Fig. 22.

1. Connect AF Generator output to AUX input of recorder through Attenuator (terminate with 600Ω if impedance of attenuator is 600Ω).
2. Insert a 100Ω resistor in series with ground lead wire of record/playback head and connect VTVM across resistor.
3. In order to cut off bias current from oscillator circuit, disconnect power connector.
4. Set recorder to RECORD mode.
5. Set AF Generator output for 1 Kc, adjust attenuator to obtain 5 mV reading at VTVM (as standard bias current is set at 0.05 mA). Set volume control at about 12 o'clock position.
6. Adjust VR17 (VR18 for channel 2) for 0-db at VU Meter.
7. If the difference of VU Meter reading between "NORMAL" and "REVERSE" forward recording is more than 3 db, further adjust VR17 (or VR18) to balance out levels for both directions, as the difference mainly occurs by the difference of impedance of record/playback head.
8. After the measurement, remove the 2-P Plug-in Type Terminal on the Oscillation Base Plate.

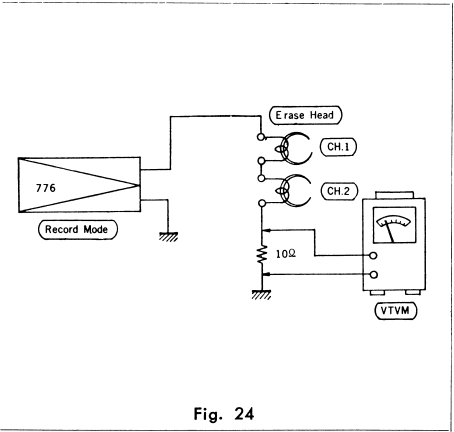


RECORD BIAS CURRENT AND FREQUENCY ADJUSTMENTS

BIAS FREQUENCY ADJUSTMENT

Instruments Required: Oscilloscope, AF Generator.
Measuring Circuit: Refer to Fig. 23.

1. Insert a 10Ω resistor in series with ground lead wire of Erase Head and connect VTVM across resistor.
2. Connect AF Generator output to Horizontal Input of Oscilloscope and compare the record bias frequency with the AF Generator. This comparison is made by reference to Lissajous, figures on oscilloscope connected to both unit. When the current between 35mA and 50 mA is applied to the Erase Head in the STEREO mode, the oscillation frequency should be 45~55 Kc.
3. If frequency is not within above, range, adjust capacitance value of C51.



ERASE CURRENT CONFIRMATION

Instruments Required: VTVM, 10Ω Resistor.
Measuring Circuit: Refer to Fig. 24.

1. Insert a 10Ω resistor in series with ground lead wire of erase head and connect VTVM across resistor.
2. Measure voltage across resistor with VTVM. Standard voltage is 400~550 mV (as standard erase current is set at 40~55 mA).

N31-3. NATIONAL MODEL RS-776S

BRAKE

A. BRAKE MECHANISM

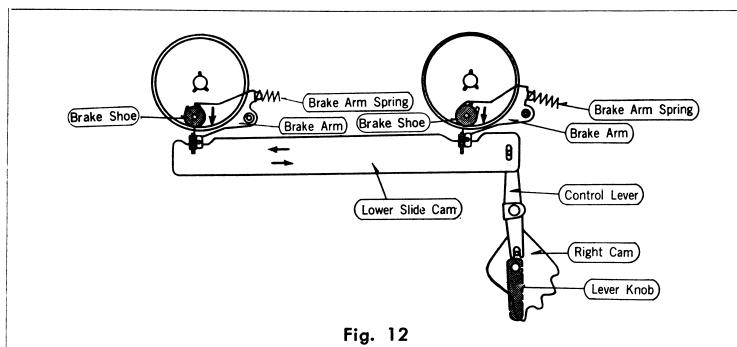


Fig. 12

When the Lever Knob is placed into the STOP position, the Brake is applied to the Mechanism.

1. The Control Lever slides the Lower Slide Cam, causing

the Cam Pin of Brake Arm to slip out of the Cam.

2. The Brake is pressed against the Reel Table by the Brake Arm Spring to stop the actions.

B. INVERSION BRAKE MECHANISM

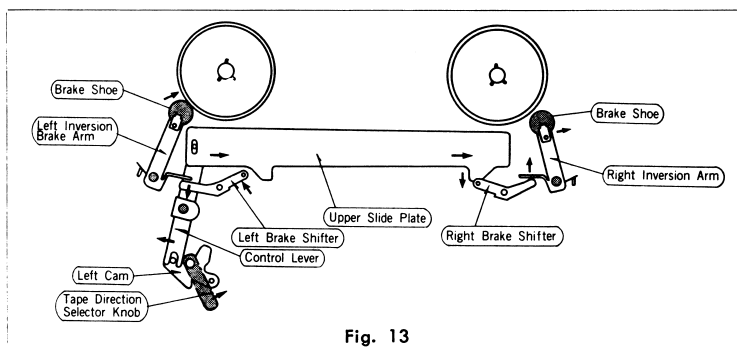


Fig. 13

1. Brake Mechanism for stopping the reverse revolution of Reel Table in case of REVERSE or FAST WIND ➡.
2. On the Left Reel Table side, the Cam Pin of the Left Brake Shifter is released, causing the Left Inversion Brake Arm to press the Brake Shoe against the Left Reel Table. It is therefore, possible for the Left Reel Table to turn to the left, but not to the right.

3. On the Takeup Reel Table side, the Cam catches the Cam Pin of the Right Brake Shifter, pushing up the Right Inversion Arm and disengages the Brake Shoe from the Right Reel Table.
4. In case of FORWARD or FAST WIND ➡, the Upper Slide Plate is moved to slide to the left, conversely to the above cases of (2) and (3).

C. BRAKE MACHANISM OF FLYWHEEL

1. Brake Mechanism for stopping the reverse revolution of the Flywheel in case of REVERSE or FAST WIND ➡.
2. The Flywheel Brake Arm-A is pressed by the Pin of Flywheel Brake Arm-B, causing the Upper Flywheel Brake Rubber to be pressed against the Flywheel. So the Flywheel can turn in one direction.
3. The Lower Flywheel Brake Rubber is disengaged from the Flywheel by means of the Flywheel Brake Arm-B.
4. In case of FORWARD or FAST WIND ➡, it is done by contraries to the above (2) and (3).

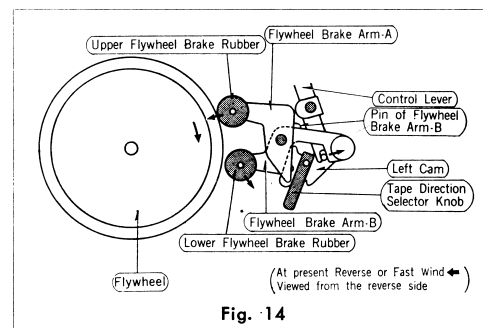


Fig. 14

RECORD

If the Lever Knob is put into the PLAY position while pushing the Record Button, the mechanism is placed into the RECORD mode.

The Revolving Mechanism is as in case of FORWARD or REVERSE.

1. The Recording Rod-A and the Record Interlock Lever are energized, and the Interlock Rod is slid to the right by the Spring.
2. When the Record Button is depressed, the Record Lever and in turn RECORD/PLAYBACK Selector Switch are brought upward and locked in RECORD mode by the action of Interlock Rod.

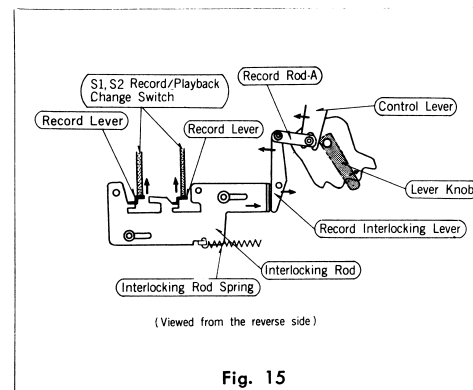


Fig. 15

INSTANT STOP

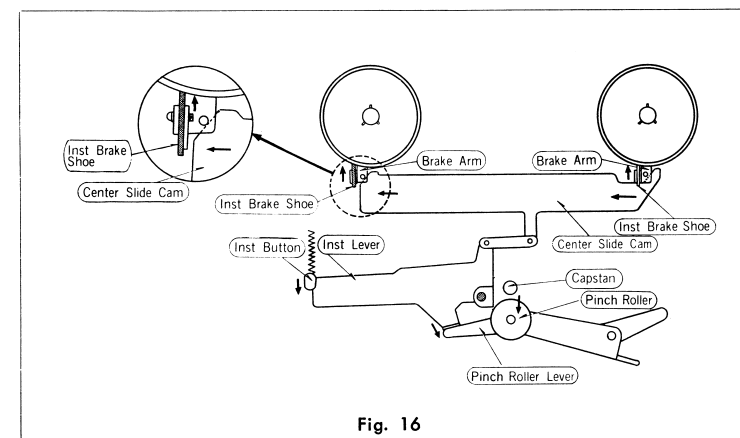


Fig. 16

During FORWARD or REVERSE, if the Inst. Button is depressed, the mechanism is placed into the INST. mode.

1. The Pinch Roller Lever is depressed by the Inst. Lever, and the Pinch Roller is disengaged from the Capstan.

2. The Center Slide Cam is moved to Slide to the left by the Inst. Lever, to push the Brake Arm upward, and in turn, to press the Inst. Brake Shoe against the Reel Table.

STOP

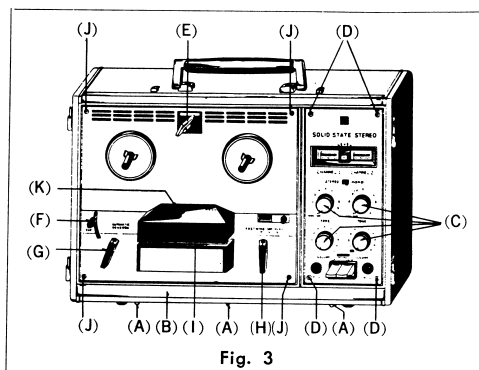
When the Lever Knob is placed from the RECORD, PLAYBACK or FAST FORWARD position into the STOP position, all the locked parts return to the original state and the Brake is applied to the Reel Table, stopping the actions.

N31-1. NATIONAL MODEL RS-776S

DISASSEMBLY INSTRUCTION

DISMOUNTING OF AMP. PANEL AND MECHA. PANEL

1. Remove 3 screws (A) on the bottom of Main Case, and then remove Front Ornament (B).
2. Draw out 4 Volume Control Knobs (C).
3. Remove 4 screws (D) at each corner of Amp. Panel, so as to detach Amp. Panel.
4. Draw out Speed Selector Knob (E), Cue Lever Knob (F), Tape Direction Selector Lever Knob (G), Operating Lever Knob (H) and Head Cover (I). As Tape Direction Selector Lever Knob (G) and Operating Lever Knob (H) are fastened with screws, take them out after loosening the screws.
5. Remove 4 screws (J) at each corner of Mecha. Panel and 1 screw (K) below Head Cover, so as to take out the Mecha. Panel.



DISMOUNTING OF MAIN CASE

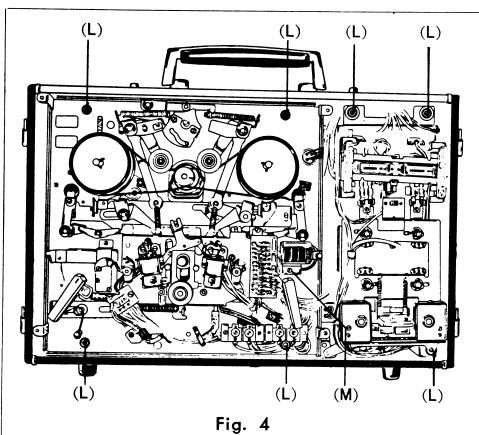
1. Remove 7 screws (L) which fasten Chassis.
2. Detach Case by lifting Chassis up. At this time, care must be taken that AC Power Cord is connected.

DISMOUNTING OF TAPE COUNTER

1. Remove Counter Belt.
2. Remove 1 screw (M) which fixes Counter.

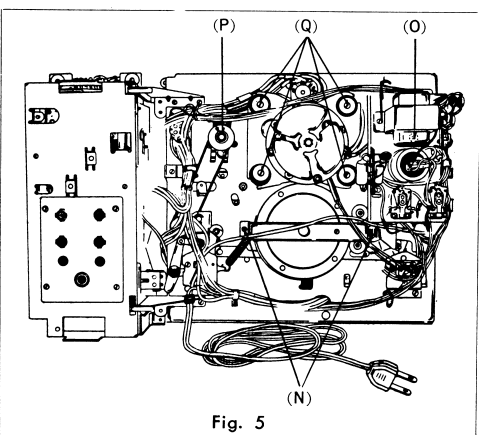
DISMOUNTING OF FLYWHEEL

1. In case that Capstan Sleeve for 50 c/s is fixed to Capstan Shaft, detach Capstan Sleeve.
2. Reverse Chassis, and remove 2 screws (N) on Flywheel Receiving Base.
3. Remove Capstan Belt, and quietly draw out Flywheel.



DISMOUNTING OF REEL TABLE

1. Detach Reel Holder from Left Reel Table and Right Reel Table.
2. Reverse Chassis.
3. Left Reel Table can be drawn out, if Backtension Metal (O) below Right Reel Table is removed.
4. Right Reel Table can be drawn out, if Counter Pulley (P) below Right Reel Table is removed.



DISMOUNTING OF MOTOR

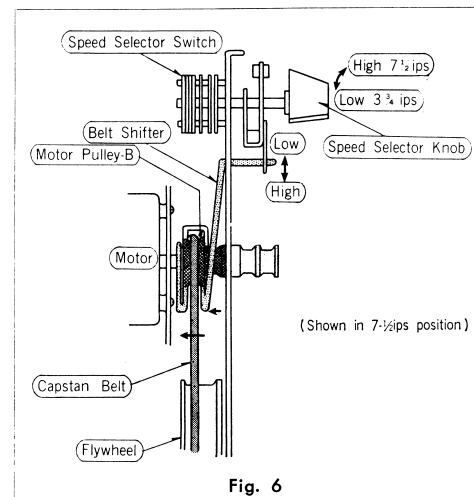
1. Remove Motor Lead Wire and Motor Oil Cup.
2. Remove 4 Motor Holding Screws (Q).
3. Hold Motor in one hand, and draw out Motor by removing Capstan Belt and 2 Takeup Belts.

TAPE TRANSPORT OPERATION

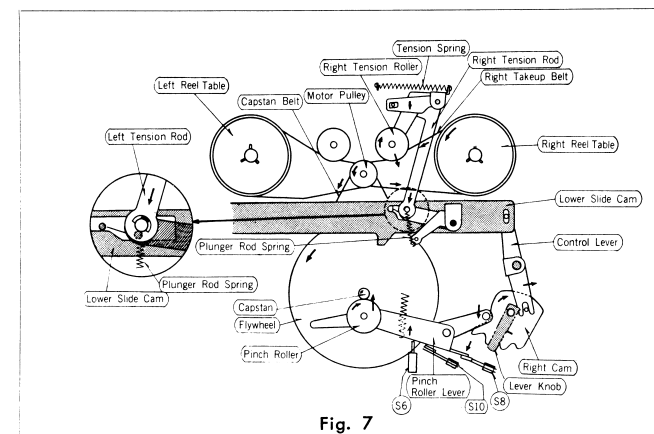
TAPE SPEED SELECTION

Tape speed can be changed by turning the speed Selector Knob. When the Speed Selector Knob is turned to the right (i.e. High Speed 7-1/2 ips), the Speed Selector Switch is changed over to the HIGH SPEED side, and the Belt Shifter is pushed downward. By means of the Belt Shifter, the Capstan Belt is transferred to the HIGH SPEED side of Motor Pulley-B.

When the Speed Selector Knob is turned to the left (i.e. Low Speed 3-3/4 ips), the contrary actions to the above follow and the set is placed into LOW SPEED mode.



FORWARD



When the Tape Direction Selector Knob is set at the FORWARD position and the Lever Knob at PLAY position, the following actions occur simultaneously, and the mechanism is placed into FORWARD mode.

1. The Right Cam is turned to the right, the Control Lever is actuated, and the Lower Slide Cam is moved to the left by the Control Lever.
2. As the Lower Slide Cam to the left, the Cam of the Right Tension Rod part is slipped off and the Right Tension Rod is pulled down.
3. The Right Tension Roller is depressed by the Right Tension Rod, and is pressed against the Right Takeup

Belt. The pressure of the Tension Roller against the Right Takeup Belt is made by the Tension Spring.

4. Consequently the rotation of Motor Pulley is transmitted to the Right Takeup Belt, and the Takeup Reel Table is rotated by the Right Takeup Belt.
5. On the other hand, the Pinch Roller Lever is moved by the Right Cam, and the Pinch Roller is pressed against the Capstan.
6. The rotation of Motor Pulley turns Flywheel through the medium of the Capstan Belt.
7. Back Tension is acquired through the Back Tension Spring under the Left Reel Table.