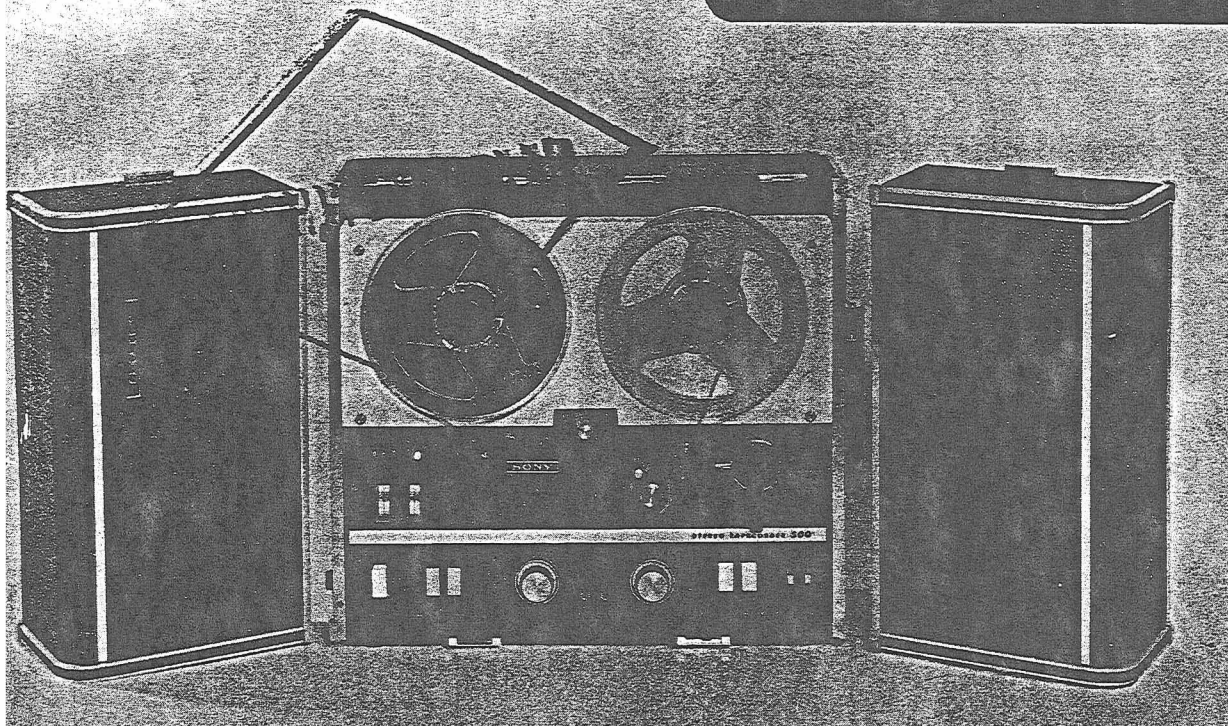


TC-500A



Specifications

- Power Requirement :** 110 Watts
100V, 110V, 117V, 125V, 220V or 240V (Voltage selector provided in the set)
AC 50 c/s or 60 c/s (Convertible by changing Capstan, Pinch Roller and Frequency Switch)
- Tape Speeds :** Instantaneous selection, 7-1/2 ips or 3-3/4 ips (19 or 9.5 cm/s)
- Track System :** 4-Track
- Reel Size :** Up to 7" (18 cm)
- Frequency Response :** 30~18,000 cps at 7-1/2 ips (19 cm/sec)
30~13,000 cps at 3-3/4 ips (9.5 cm/sec)
- Signal-to-Noise Ratio :** 50 dB (Measured by NAB standards)
(Per Channel)
- Flutter and Wow :** Less than 0.15% at 7-1/2 ips
Less than 0.20% at 3-3/4 ips
- Bias Frequency :** Approx. 80 Kc
- Level Indication :** Two VU Meters (calibrated to 0 dB at 12dB below saturation)
- Input Circuit :** 2-Microphone Jack (high impedance)
2-Auxiliary Input Jack (high impedance)
- Output Circuit :** 2-Monitor Speaker Jack (low impedance)
2-Line Output Jack (1.5 K Ω -0 dB)
1-Binaural Monitor Jack (low impedance)
- Output Level :** Monitor Speaker (3 watts per channel)
- Tube Complement :** 2-12AD7 (or 12AX7), 2-6AU6, 2-6AQ5, 1-12BH7A, 1-6CA4
- Weight :** Approx. 55 lbs. (25 Kg)
- Dimensions :** 18-1/2 W x 16-3/16 D x 12-1/4 H"
(470 W x 410 D x 310 H mm)

SONY®
SERVICING GUIDE

Removal of Reel Panel

- 1) Remove 5 phillips head screws and chrome cup washers, being careful not to loosen plastic washers from decorative metal washers.
- 2) Lift panel from recorder.

Removal of Control Panel

- 1) Remove speakers.
- 2) Remove fuse and cap.
- 3) Place recorder face down on padded surface.
- 4) Remove 2 machine screws and washers under handle.
- 5) Remove 4 screws and washers from back of case.
- 6) The chassis can be removed from case.

Removal of Chassis from Cabinet

- 1) Remove head cover.
- 2) Remove speed selector knob.
- 3) Remove plastic cap from instant stop lever.
- 4) Remove function selector knob.
- 5) Remove MIC/play knobs—by pulling off.
- 6) Remove auxiliary knobs—by loosening set screw.
- 7) Remove phillips screw and washer under head cover and both tape guides.
- 8) Remove electronics bottom cover ; loosen 3 oval head phillips screws on rear of chassis ; cover will then slip out.
- 9) Remove 3 phillips head screws and washers—located just under lip of electronics chassis.
- 10) Lift control panel from recorder.

Alignment Procedure

The alignment is to be performed at a tape speed of 7-1/2 ips unless otherwise specified. Connect an 8 ohm load resistor in parallel with the VTVM terminals and connect the VTVM to the Speaker Output Jack (J₁₀₄) and/or J₂₀₄). Set the Speaker ON/OFF Switch on.

1. Azimuth Alignment of the Playback Head

- 1) Align the upper edges of the Erase Head Core and Rec/PB Head Core and upper edge of Tape by turning the two Tape Guides located near the Heads. (H10 in Fig. 6)
- 2) Play back a 10 kc signal recorded on the first section of the SONY alignment tape "N-19-F1".
- 3) Adjust the azimuth alignment screw located on the right side of the Playback Head to obtain the maximum reading on the VTVM.
- 4) Perform the procedure 1) again.
- 5) Turn the Tape Guide (H10 L) clockwise by 30 degrees and the Tape Guide (H10 R) counter-clockwise by 30 degrees.
- 6) Perform the procedure 3) again.

2. Adjustment of Maximum Output

- 1) Turn the MIC/Playback Level Control R_{114} (R_{214}) (shown in Fig. 4) clockwise to the full.
- 2) Set the Bass Boost Switch off.
- 3) Play back the 700 c/s signal recorded on the third section of the Alignment Tape "N-19-F1".
- 4) Adjust the Potentiometer R_{126} (R_{226}) (shown in Fig. 2) so that the VTVM indicates 4.47 V (2.5 W).

3. Adjustment of Frequency Response

- 1) Play back the 700 c/s signal recorded on the third section of the Alignment Tape "N-19-F1".
- 2) Turn the MIC/Playback Level Control R_{114} (R_{214}) (shown in Fig. 4) until the VTVM indicates 0 dBs (0.775 V).
- 3) Play back the 10 kc signal recorded on the 4th section of the Alignment Tape and adjust the Playback Equalizer R_{107} (R_{207}) (shown in Fig. 2) so that the VTVM reading is within ± 2 dB.

4. Adjustment of Hum Balancer

- 1) Play back the 700 c/s signal recorded at the standard recording level on the second section of the alignment tape "N-19-F1".
- 2) Adjust the MIC/Playback Level Control R_{114} (R_{214}) (shown in Fig. 4) so that the VTVM indicates 2.83 V (1 W).
- 3) Remove the Alignment Tape.
- 4) Press the Record Button and adjust the Hum Balancer R_7 (R_8) (shown in Fig. 3) for the minimum reading on the VTVM.
- 5) Set the machine in "PLAY" mode.
- 6) Adjust the Hum Bucking Coil L_{102} (L_{202}) (shown in Fig. 3) for the minimum reading on the VTVM.

5. Playback Level Adjustment

- 1) Set the Speaker ON/OFF Switch off. Connect a VTVM to the LINE OUT Jack.
- 2) Play back a 700 c/s signal recorded on the third section of the alignment tape "N-19-F1" and turn the MIC/Playback Level Control R_{114} (R_{214}) (shown in Fig. 4) until the VTVM reads 0 dBs (0.775 V).
- 3) Turn the Playback Level Control R_{135} (R_{235}) (shown in Fig. 2) until the VU Meter reads 0 VU.

6. Recording Bias Adjustment

- 1) Set the machine in record mode.
- 2) Connect a VTVM across winding of the Rec/PB Head of Channel 1 (Channel 2).
- 3) Adjust the Trimmer Capacitor C_2 (C_3) shown in Fig. 2 so that the VTVM indicates between 90 V and 100 V.

7. Recording Level Adjustment

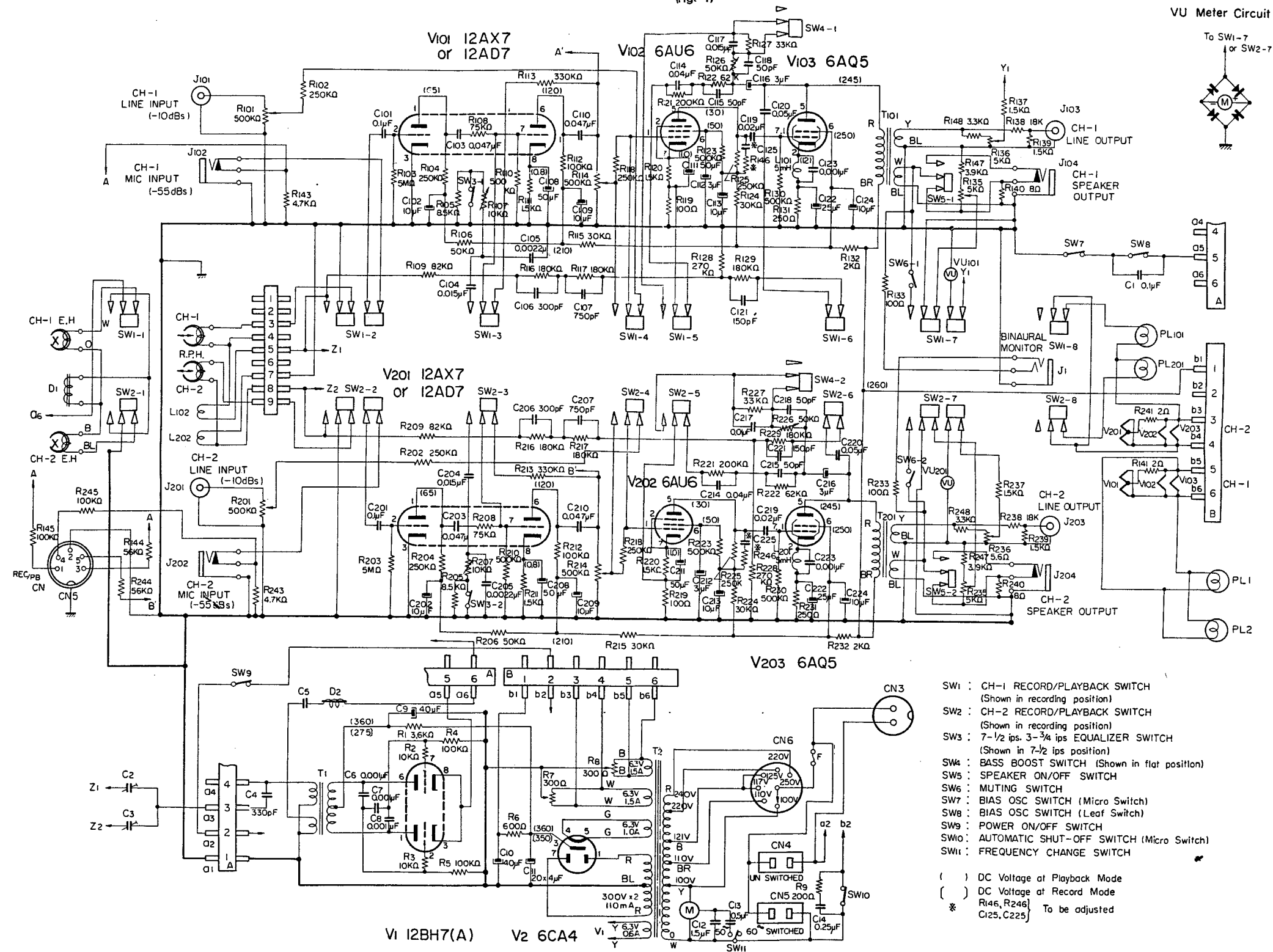
- 1) Set the Speaker ON/OFF Switch off.
- 2) Thread the SONY Alignment Tape "N-19-F1" on the machine.
- 3) Play back the 700 c/s tone which is recorded on the second section of the Alignment Tape.
- 4) Turn the MIC/Playback Level Control R_{114} (R_{214}) (shown in Fig. 4) so that the VU Meter indicates 0 VU.
- 5) Replace the Alignment Tape with a new Tape.
- 6) Set the machine in record mode.
- 7) Feed a 1 kc signal of -10 dBs from "LINE INPUT" Jack and turn the Aux. Recording Level Control R_{101} (R_{201}) (shown in Fig. 4) so that the VU Meter indicates 0 VU when the recorded signal is played back.
- 8) Set the machine in record mode. Turn the Recording Level Control R_{136} (R_{236}) (shown in Fig. 2) until the VU Meter indicates 0 VU.

Quick Guide to Simple Servicing

Trouble	Possible Cause	Service
Pilot lights out, motor inoperative	Open AC circuit	Check AC line connection to wall or chassis, check fuse, check On/Off switch. Check automatic shut-off switch.
No sound in playback when meters indicate signal	Defective speaker cords	Check speaker, cords and plugs for short or open circuits. Check SPEAKER SWITCH.
No sound in playback and meters do not indicate signal	Defective tubes in pre-amplifiers, head leads disconnected, defective rectifier 6AC4 tube, or defective power amplifier tube 6AQ5	Check pre-amplifier tubes 12AD7 and check lead connections of heads and at plugs in chassis. Check 6CA4 rectifier tube and check 6AQ5 amplifier tube.
Poor volume or dull sound in playback, poor frequency response	Dirt on head tracks	Clean heads.
Excessive tape hiss	Magnetized heads	Demagnetize heads.
Flutter and wow	Dirt and grease on capstan or pinch roller, slipping tape	Clean capstan and roller, lubricate motor, tighten capstan screw.
Crackling noise during volume adjustments	Dirty or defective volume controls	Contact competent technician or service station.
Pre or post echoes on recorded tapes	Print-through effect due to exposure of tapes to heat or magnetic fields	NOTE: To prevent print through, store tapes in cool place. Remove from storage space when operating the recorder.
Operates in playback but not in record, no meter indication	Defective microphones or microphone leads or input	Check if the recorder is in record position, check movement of record/playback switch, check microphone jacks or aux. input jacks.
Previously recorded sounds in background of newly recorded tapes	Poor erasure, dirt on heads	Clean erase head, check oscillator tube (1 28H7A).

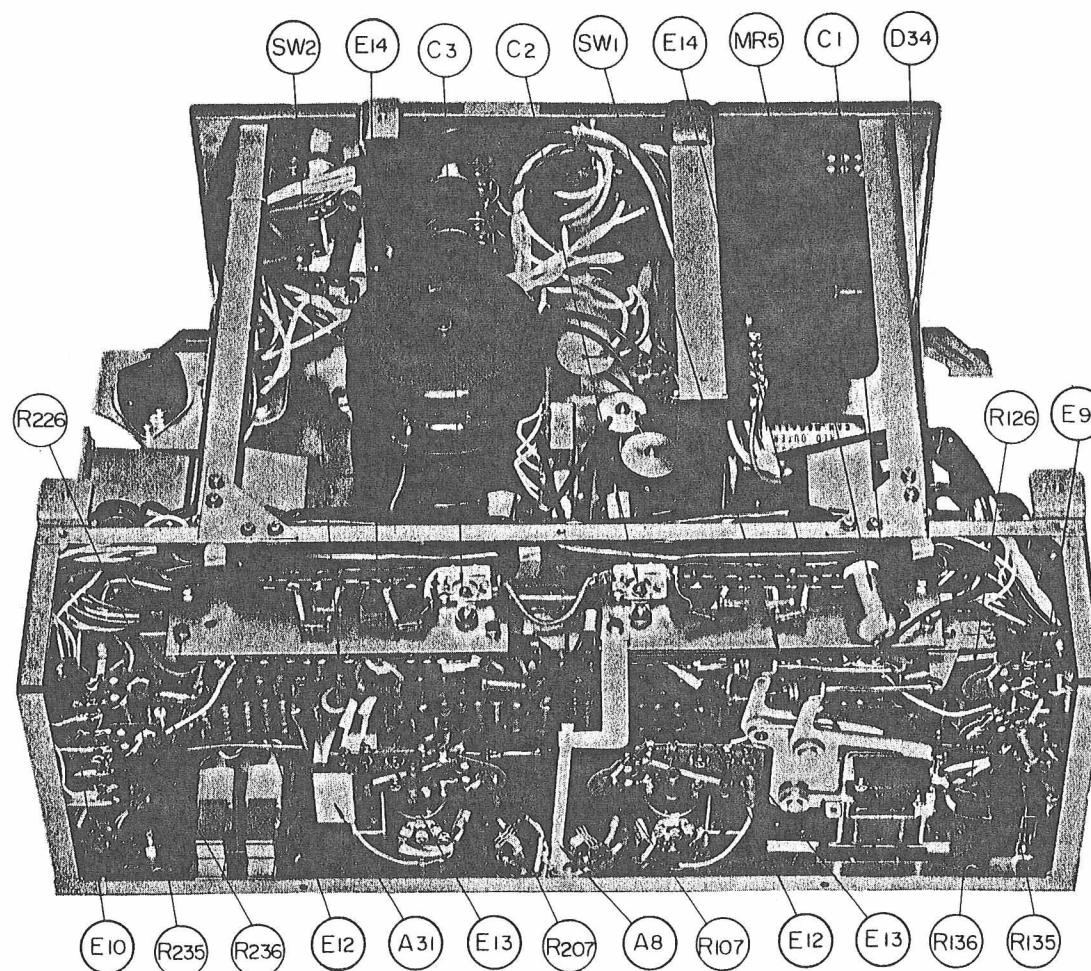
Schematic Diagram

(Fig. 1)



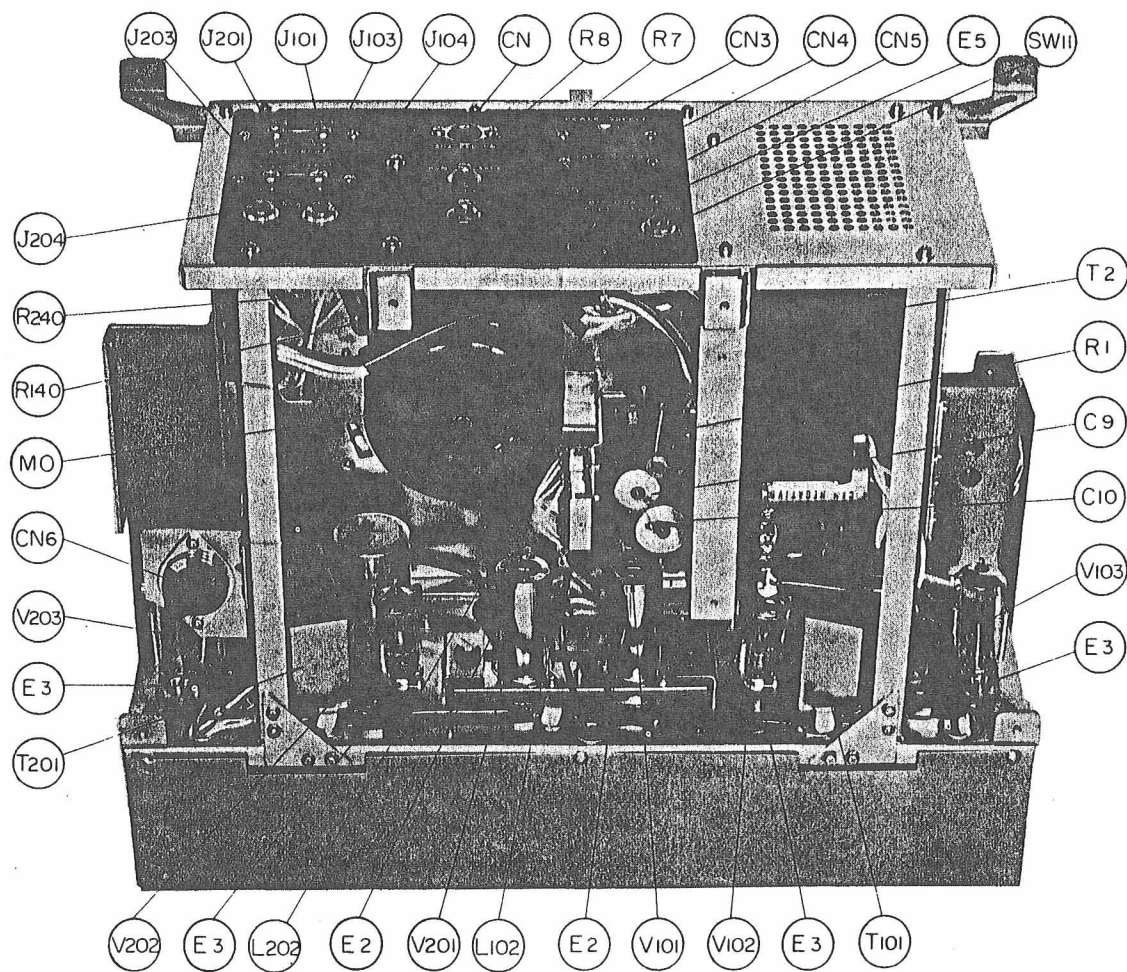
Bottom View of Amplifier

(Fig. 2)



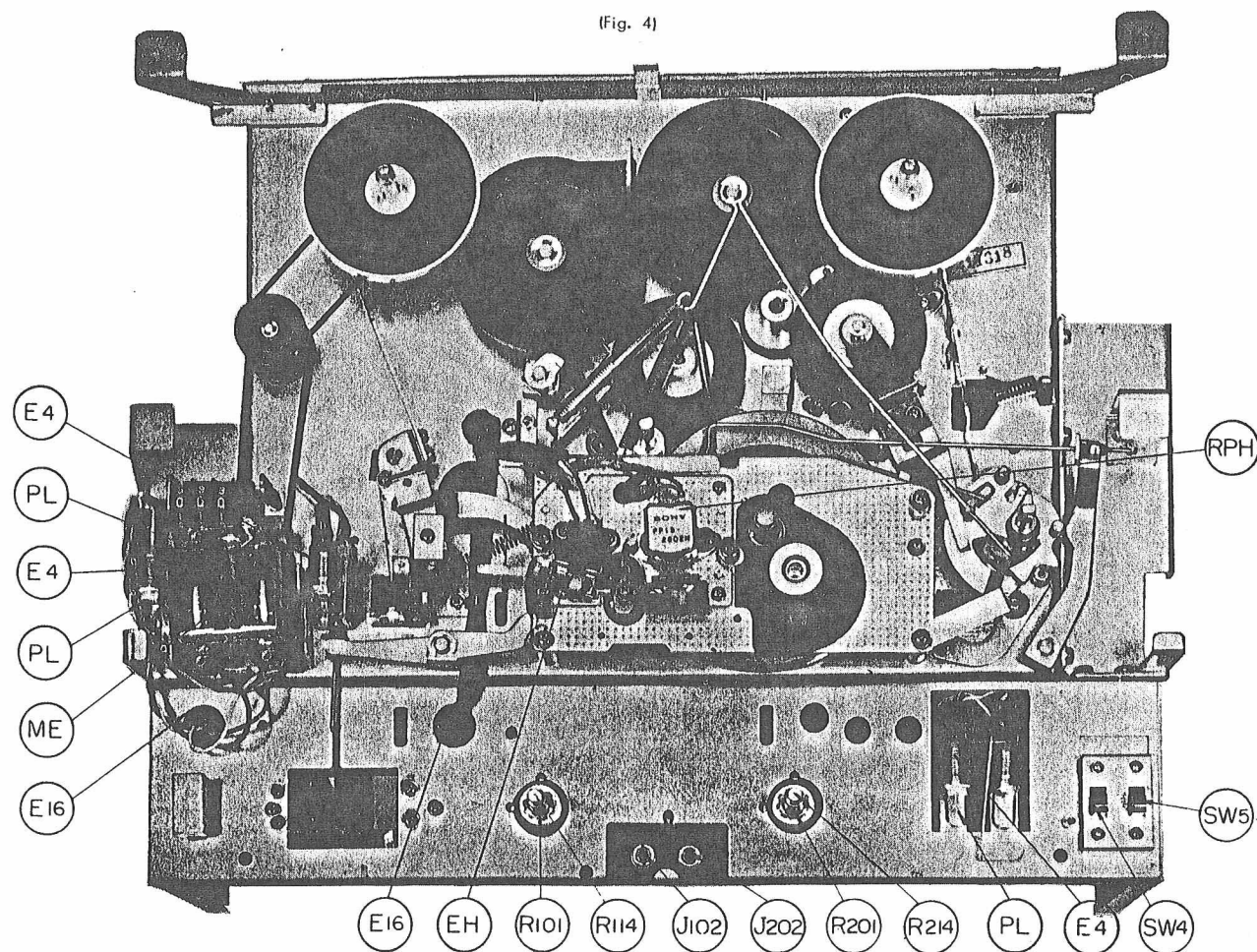
Location of Major Electrical Parts

(Fig. 3)



Tape Transport Mechanism

(Fig. 4)



Cabinet & Appearance Section

Parts List

Symbol No.	Description	Q'ty	Symbol No.	Description	Q'ty
1	Cabinet Ass'y, including	1	13	Record Button Ass'y, including	2
1-1	Cabinet	(1)	13-1	Setting Screw	(2)
1-2	Cabinet Sash (A)	(2)	13-2	Nut for Setting Screw	(2)
1-3	" " (D)	(2)	14	Function Selector Knob Ass'y, including	1
1-4	Plastic Sash Cover (A)	(2)	14-1	Setting Screw	(1)
1-5	" " " (B)	(2)	15	Volume Control Knob (Upper) Ass'y, including	2
1-6	Grip Handle Ass'y	(1)	15-1	Setting Screw	(2)
1-7	Grip Handle Cover (Clear)	(1)	16	Volume Control Knob (Lower) Ass'y, including	2
1-8	Grip Handle Mounting Bracket	(2)	16-1	Face Plate	(2)
1-9	Screw Bolt for Grip Handle	(2)	16-2	Setting Screw	(2)
1-10	Rubber Handle Washer	(2)	17	Fast Forward Knob	1
1-11	Holding Plate for Grip Handle Bracket	(1)	18	Instant Stop Lever Knob	1
1-12	Ventilator Funnel	(1)	19	Spring for Fast Forward	1
1-13	Ventilator Grille	(1)	20	Spacer for Reel Mounting Screw	5
1-14	Lid for Connector Plate	(1)	21	Nylon Washer for Reel Panel Mount	5
1-15	Lock Metal for Connector Lid	(2)	22	Tension Lever Guide	2
1-16	Rubber Foot Stopper	(8)	23	Washer for Cabinet	6
1-17	Rubber Foot (Large)	(8)	24	Speaker Box Right (Cabinet Lid) Ass'y,	
1-18	" (Small)	(4)		including	1
1-19	Lid for AC Voltage Selector	(1)	24-1	Sash (B)	(1)
1-20	Reinforcing Plate for Cabinet	(4)	24-2	" (C)	(1)
1-21	Lock (Right)	(1)	24-3	" (D)	(2)
1-22	" (Left)	(1)	24-4	Plastic Sash Cover (A)	(2)
1-23	Speaker Box (Right)	(1)	24-5	" (B)	(2)
1-24	" (Left)	(1)	24-6	Baffle Board Holding Screw	(4)
2	Specification Label	1	24-7	Speaker Back Board	(1)
3	Escutcheon (Binaural Monitor)	1	24-8	Speaker Grille Metal	(1)
4	Escutcheon Holding Plate	1	24-9	Speaker Metallic Cover	(1)
5	Defeat Chain	1	24-10	Microphone Bag	(1)
6	Control Panel Ass'y, including	1	24-11	Stopper Washer for Rubber Foot	(2)
6-1	Control Panel	(1)	24-12	Cabinet Hinge	(2)
6-2	Lamp Cap	(2)	24-13	Speaker Holding Screw	(4)
6-3	Indicating Plate for Tape Speed	(1)	24-14	Rubber Foot	(2)
6-4	Ornamental Strip Holding Screw Post	(3)	24-15	Name Plate	(1)
6-5	Washer Ornamental Strip Holding Screw Post	(3)	25	Speaker Box Left (Cabinet Lid) Ass'y,	
6-6	Washer for Ornamental Strip	(3)		including	1
6-7	Spacer for Lamp Cap	(2)	25-1	Sash (B)	(1)
6-8	Ornamental Strip	(1)	25-2	" (C)	(1)
7	Panel Spacer (Metal) for Control Panel	1	25-3	" (D)	(2)
8	Washer for Panel Spacer (Control Panel)	1	25-4	Plastic Sash Cover (A)	(2)
9	Reel Panel	1	25-5	" (B)	(2)
10	Head Cover Ass'y, including	1	25-6	Baffle Board Holding Screw	(4)
10-1	Name Plate "SONY"	(1)	25-7	Speaker Back Board	(1)
10-2	Head Cover Cushion	(1)	25-8	Speaker Grille Metal	(1)
10-3	Setting Screw	(2)	25-9	Speaker Metallic Cover	(1)
11	Speed Selector Knob Ass'y, including	1	25-10	Microphone Bag	(1)
11-1	Face Plate	(1)	25-11	Stopper Washer for Rubber Foot	(2)
11-2	Setting Screw	(1)	25-12	Cabinet Hinge	(2)
12	CN-OFF Push Button Ass'y, including	1	25-13	Speaker Holding Screw	(4)
12-1	Setting Screw	(1)	25-14	Rubber Foot	(2)
12-2	Nut for Setting Screw	(1)	26	Sash (E) for Speaker Box	2
			27	Speaker Cord Packing for Speaker Box	2

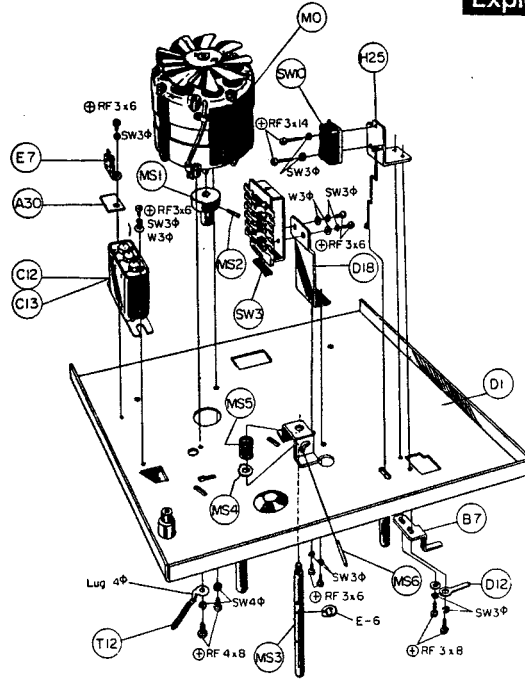
Head Deck and Capstan Fly Wheel Section

Symbol No.	Description	Q'ty	Symbol No.	Description	Q'ty
H1	Head Shield Plate for Erase Head	1	H6	Head Pad for Rec./P. B. Head. P-820-724	1
H2	Head Shield Plate for Rec./P. B. Head	1	H7	Head Deck Ass'y, including	1
H3	Head Pad for Erase Head	1	H7-1	Head Deck	(1)
H4	" "	1	H7-2	Felt Cushion	(1)
H5	Head Pad for Rec./P. B. Head	1	H7-3	Pinch Lever Shaft	(1)

Parts List

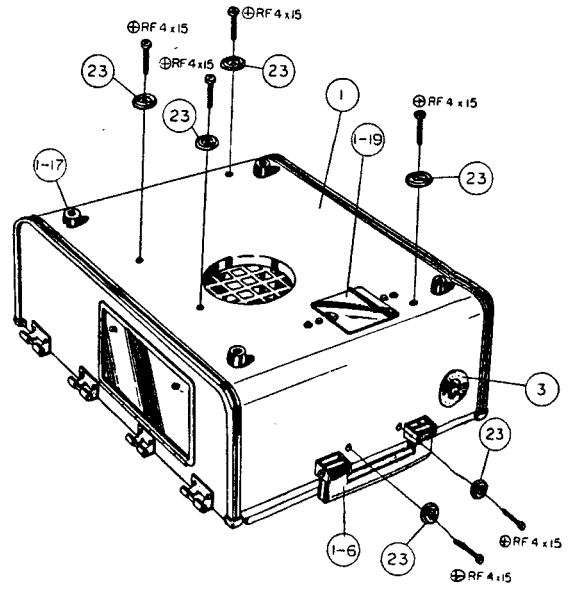
Symbol No.	Description	Q'ty	Symbol No.	Description	Q'ty
R106, 206	50 K Ω $\frac{1}{2}$ W Carbon	2	R147, 247	3.9 K Ω $\frac{1}{4}$ W Carbon	2
R107, 207	10 K Ω Semi-Fixed	2	R148, 248	3.3 K Ω " "	2
R108, 208	75 K Ω $\frac{1}{2}$ W Carbon	2	Capacitors		
R109, 209	82 K Ω $\frac{1}{4}$ W "	2	C1	0.1 μ F 400VV Oil Paper	1
R110, 210	500 K Ω $\frac{1}{2}$ W "	2	C2	30~200PF Trimmer Capacitor	1
R111, 211	1.5 K Ω " "	2	C3	30~200PF "	1
R112, 212	100 K Ω " "	2	C4	330PF 1,000VV Mica	1
R113, 213	330 K Ω $\frac{1}{4}$ W "	2	C5	0.5 μ F 250VV MP (Tubular)	1
R114, 214	500 K Ω Aux. Input Level Control (Combined with R101(201))	2	C6	0.001 μ F 400VV Mica	1
R115, 215	30 K Ω $\frac{1}{2}$ W Carbon	2	C7	0.001 μ F " "	1
R116, 216	180 K Ω $\frac{1}{4}$ W "	2	C8	0.001 μ F " "	1
R117, 217	180 K Ω " "	2	C9	40 μ F " Electrolytic (Tubular)	1
R118, 218	250 K Ω $\frac{1}{2}$ W "	2	C10	40 μ F 350VV " (")	1
R119, 219	100 Ω " "	2	C11	20 μ F $\times$ 4 450VV "	1
R120, 220	1.5 K Ω " "	2	C12, 13	1.5 μ F + 0.5 μ F MP	1
R121, 221	200 K Ω " "	2	C14	0.25 μ F 600VV Oil Paper	1
R122, 222	62 K Ω " "	2	C101, 201	0.1 μ F 100VV Mylar	2
R123, 223	500 K Ω " "	2	C102, 202	10 μ F 350VV Electrolytic	2
R124, 224	30 K Ω " "	2	C103, 203	0.047 μ F 200VV Mylar	2
R125, 225	250 K Ω " "	2	C104, 204	0.015 μ F 50VV "	2
R126, 226	50 K Ω Semi-Fixed	2	C105, 205	0.0022 μ F " "	2
R127, 227	33 K Ω $\frac{1}{4}$ W Carbon	2	C106, 206	300PF 250VV Polyethylene	2
R128, 228	270 K Ω " "	2	C107, 207	750PF " "	2
R129, 229	180 K Ω " "	2	C108, 208	50 μ F 6VV Electrolytic (Tubular)	2
R130, 230	500 K Ω $\frac{1}{2}$ W "	2	C109, 209	10 μ F 350VV "	2
R131, 231	250 Ω 2W "	2	C110, 210	0.047 μ F 200VV Mylar	2
R132, 232	2 K Ω $\frac{1}{4}$ W "	2	C111, 211	50 μ F 6VV Electrolytic (Tubular)	2
R133, 233	100 Ω $\frac{1}{4}$ W "	2	C112, 212	3 μ F 350VV "	2
R134, 234	—deleted—		C113, 213	10 μ F " "	2
R135, 235	5 K Ω Semi-Fixed	2	C114, 214	0.04 μ F 100VV Mylar	2
R136, 236	5 K Ω " "	2	C115, 215	50PF 250VV Polyethylene	2
R137, 237	1.5 K Ω $\frac{1}{2}$ W Carbon	2	C116, 216	3 μ F 350VV Electrolytic (Tubular)	2
R138, 238	18 K Ω " "	2	C117, 217	0.015 μ F 50VV Mylar	2
R139, 239	1.5 K " "	2	C118, 218	50PF 250VV Polyethylene	2
R140, 240	8 Ω 2W "	2	C119, 219	0.02 μ F 100VV Mylar	2
R141, 241	2 Ω $\frac{1}{2}$ W Wire Wound	2	C120, 220	0.05 μ F 400VV Oil Paper	2
R142, 242	—deleted—		C121, 221	150PF 250VV Polyethylene	2
R143, 243	4.7 K Ω $\frac{1}{4}$ W Carbon	2	C122, 222	25 μ F 15VV Electrolytic	2
R144, 244	56 K Ω " "	2	C123, 223	0.001 μ F 100VV Mylar	2
R145, 245	100 K Ω " "	2	C124, 224	10 μ F 350VV Electrolytic	2
R146, 246	10 K Ω " "	2	C125, 225	200PF 250VV Polyethylene	2

[Fig. 5]

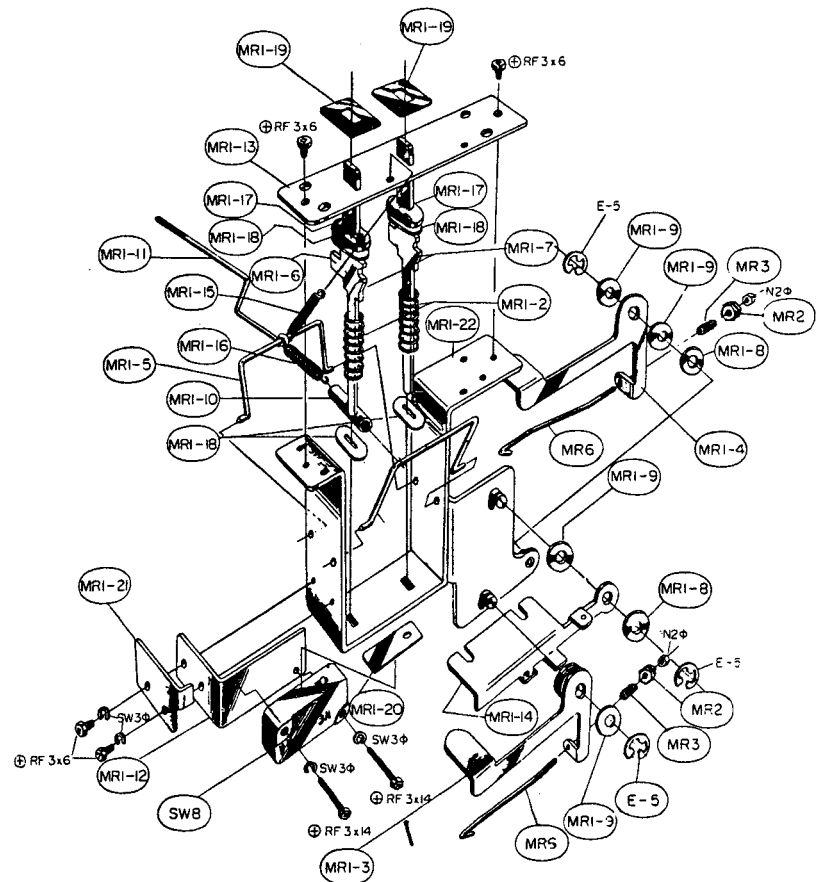


Exploded Diagram

[Fig. 6]

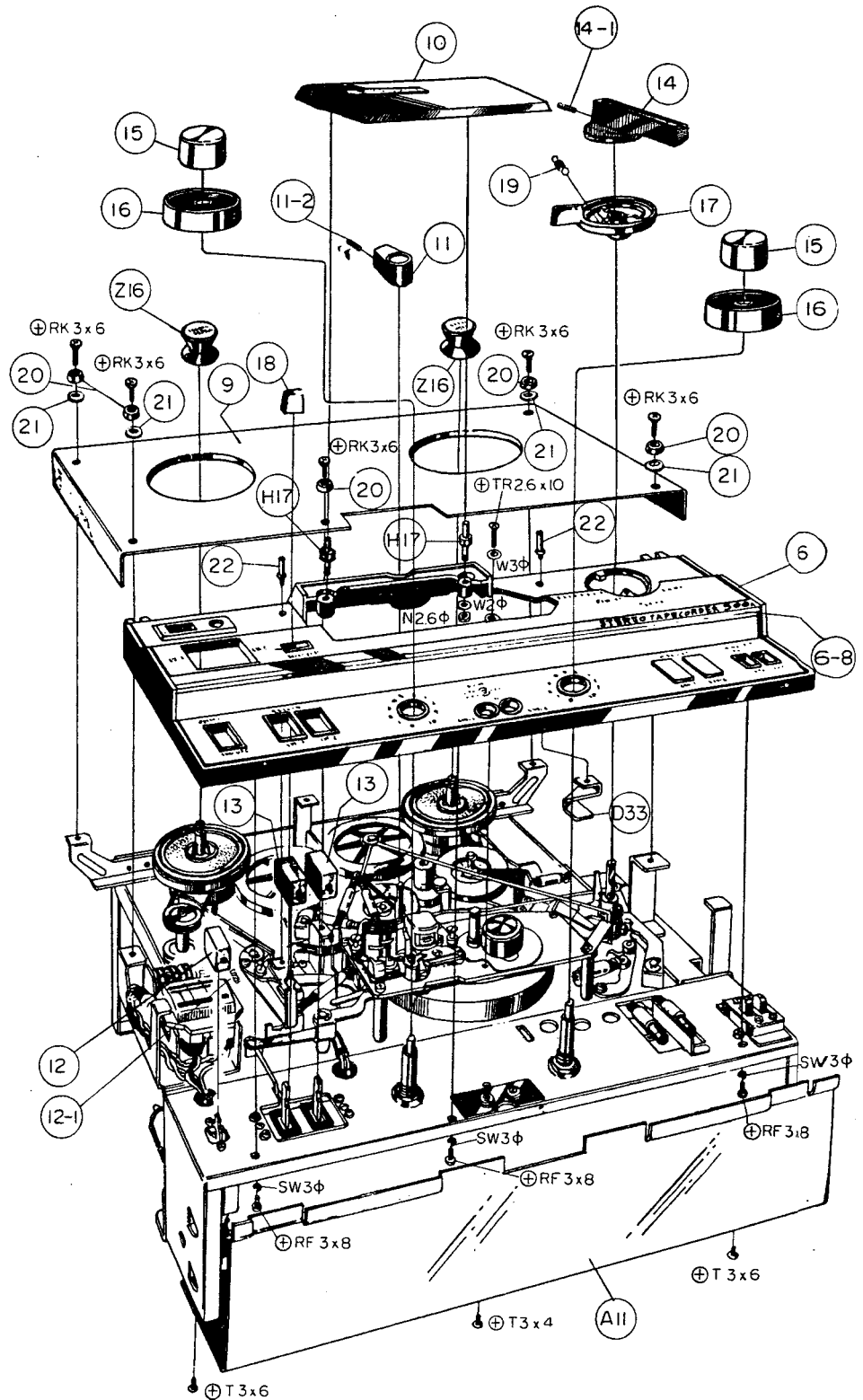


[Fig. 7]



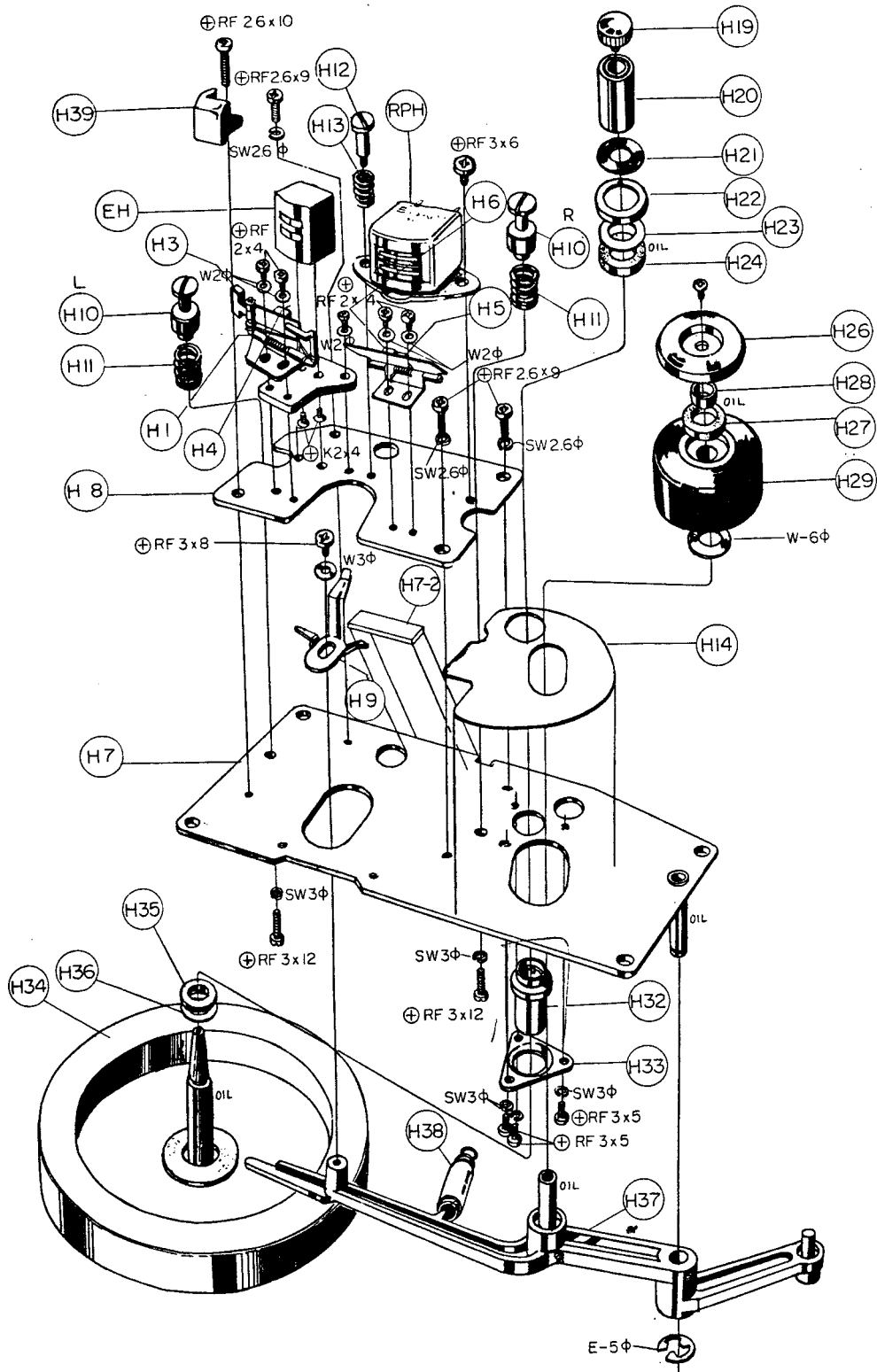
Exploded Diagram

(Fig. 8)



Exploded Diagram

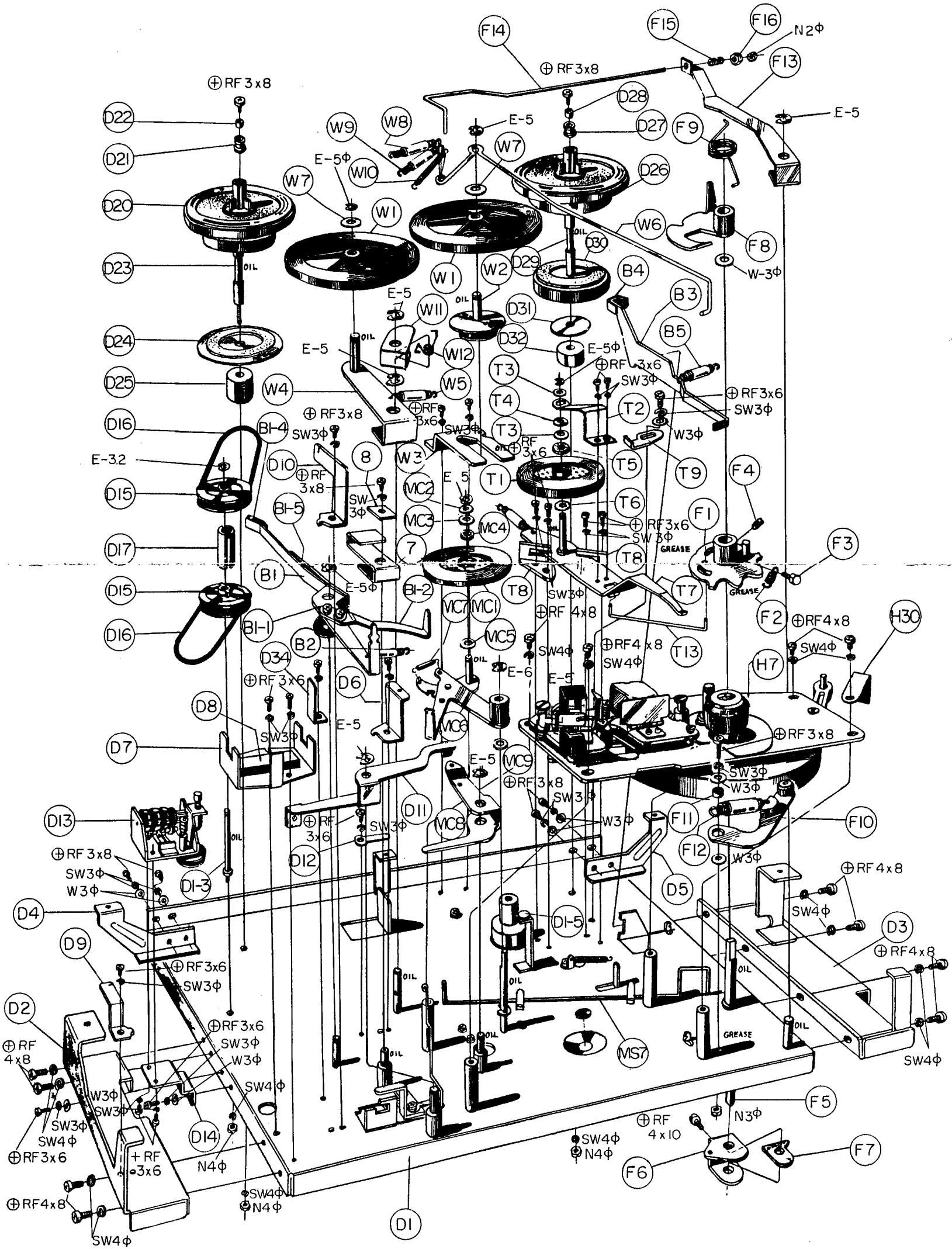
(Fig. 9)



Exploded Diagram

(Fig. 10)

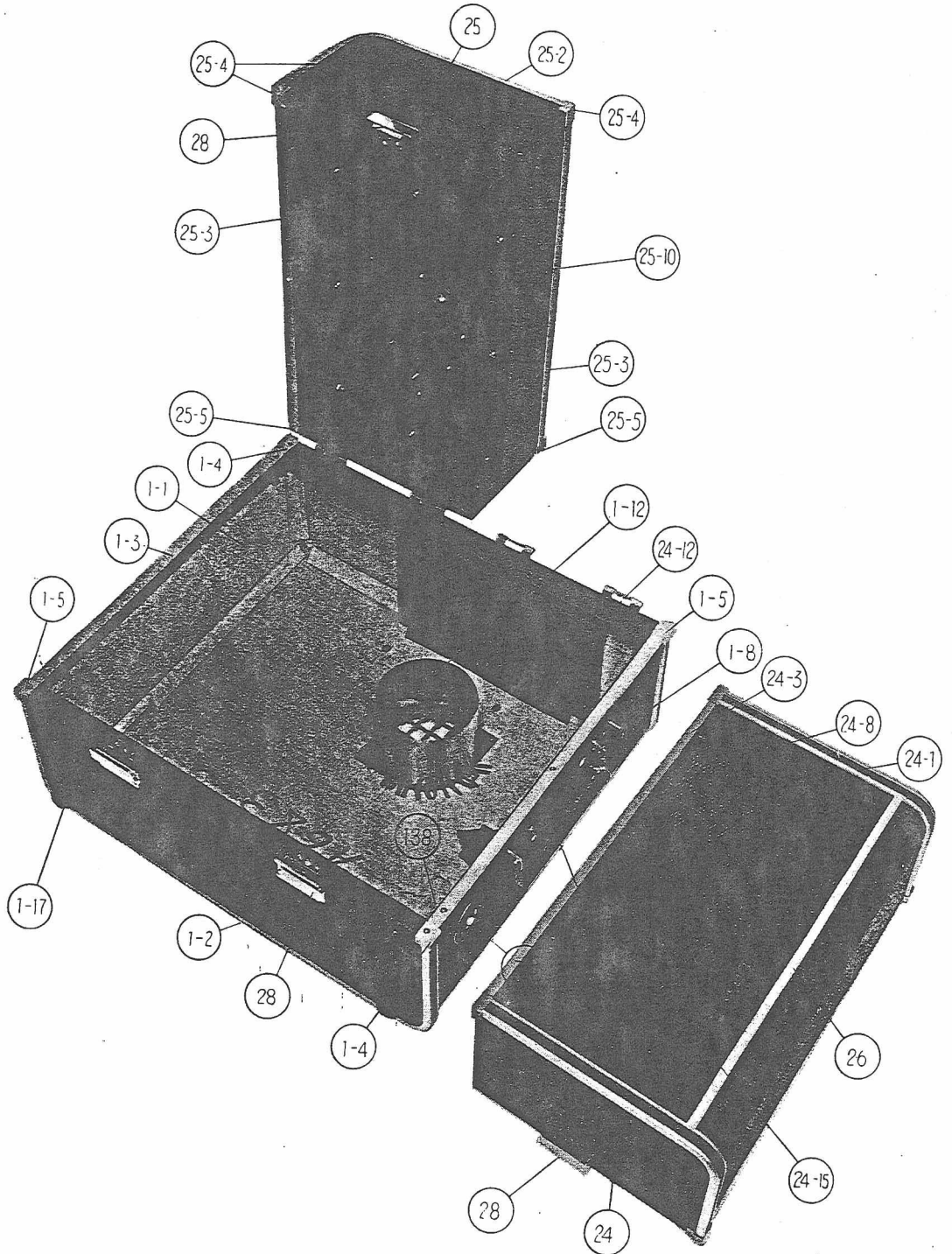
— 19 —



— 20 —

Cabinet Assembly

(Fig. 12)



SONY CORPORATION

