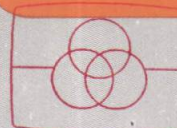


TC-120

Except for USA

 Set using ISO screw



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SPECIFICATIONS

Power Requirements: AC 100, 110 - 120, 220 - 240V
(Voltage selector provided in the set)
50/60 Hz, 3W
DC Four flashlight batteries "C" × 4
Rechargeable battery (BP-16)
is available as optional accessory
(Built in rechargeable facility)

Track System: Two-track mono

Tape: SONY tape cassette or equivalent

Recording Time: 1.0 hr at 1 7/8 ips (4.8 cm/s)
with SONY tape cassette C-60
1.5 hrs at 1 7/8 ips (4.8 cm/s)
with SONY tape cassette C-90

Frequency Response: 50 - 10,000 Hz

Signal-to-Noise Ratio: Better than 46 dB

Power Output: 1.5W maximum across 8Ω load

Recording Bias Frequency: Approx. 85 kHz

Inputs: MIC input
Impedance, low impedance
Maximum Sensitivity, -72 dB (0.2 mV)

AUX input
Impedance, 100 kΩ
Maximum Sensitivity, -22 dB (0.06 V)

REMOTE control jack

Output: MONITOR output
Impedance, 8Ω load or more
Output Level, 0.775V (0 dB)
with 10 kΩ load

Speaker: 2 3/4 × 4" (7 × 10 cm) PM dynamic, 8Ω

Semiconductors: 9 transistors and 7 diodes

Dimensions: 9 15/16 (W) × 2 1/2 (H) × 5 13/16" (D)
(252 × 63 × 147 mm)

Weight: 4 lb 13 oz (2.2 kg)
(including batteries)

SONY®
SERVICE MANUAL

TABLE OF CONTENTS

	<i>Page</i>		<i>Page</i>
SPECIFICATIONS	1	10. ELECTRICAL PARTS LIST	11
1. GENERAL DESCRIPTION	2	11. LEVEL DIAGRAM	12
2. TECHNICAL FEATURES	2~3	12. ELECTRICAL ADJUSTMENT	13
3. BLOCK DIAGRAM	3	HARDWARE NOMENCLATURE	13
4. CABINET -TOP VIEW-	3	13. MECHANICAL ADJUSTMENT	14
5. CHASSIS -TOP VIEW-	4	14. EXPLODED VIEW	
6. CHASSIS -BOTTOM VIEW-	4	14-1. Cabinet -top view-	15
7. DISASSEMBLY	5	14-2. Chassis -top view-	16
8. SCHEMATIC DIAGRAM	6	14-3. Chassis -bottom view-	17
9. MOUNTING DIAGRAM		14-4. Packing	18
- Conductor Side -	7~8		
- Component Side -	9~10		

1. GENERAL DESCRIPTION

The SONY Model TC-120 is a compact cassette-type tape recorder which operates on either household AC or on four "C" size flashlight batteries or the optional accessory rechargeable battery pack, BP-16. Record volume is adjusted to the optimum level by the built-in automatic gain control (AGC) circuit to assure proper recording level without touching the controls. All functions are operated with finger-tip ease by the piano-key mode switches. Portable convenience is provided with the built-in speaker and built-in electret condenser microphone. The TC-120 also features the ANTI-WOW MECHANISM and the End-of-Tape Alarm which provides audible warning when the end of the cassette tape is reached to prevent the possibility of inadvertently missing important material while recording. It operates in any carrying position, providing two-track monophonic high fidelity cassette performance.

2. TECHNICAL FEATURES

2-1. End-of-Tape Alarm

The TC-120 is provided with a special sensing circuit which produces an audible alarm through the speaker when the end of the cassette tape is reached during recording. The alarm sounds when the sensing poles are short-circuited by foil strips at the end of the tape producing positive feedback. (The sensing pole is grounded during playback and there is no alarm)

Note: The End-of-Tape Alarm operates only when foil equipped cassettes are used, such as the SONY AUTO-SENSE TAPE CASSETTE.

2-2. Electret Condenser Microphone

The condenser microphone has long been known for its several desirable characteristics: flat frequency

response, high sensitivity, wide dynamic range, and good transient response along with physical durability and ruggedness.

The need for an external power supply has been one drawback to the condenser microphone. The SONY Electret Condenser microphone retains the desirable qualities of the regular condenser types while eliminating the external power requirement, representing a significant advancement in the production of a simple, low-cost, high performance microphone. The SONY "electret-treated" high-polymer film diaphragm reduces physical size requirements, needs no additional power supply and provides outstanding performance.

Note: The "electret-treatment" is based on the fact that certain materials, when placed in a high potential electric field, retain an electric polarization when removed from the field. Extensive research by SONY engineers has developed the electret principle to an advanced state of stability unattainable until now.

Another milestone is the built-in impedance-translator amplifier which uses a Field Effect Transistor (EFT) type of monolithic integrated circuit. The combination of the electret-condenser with the IC FET amplifier results in a microphone product representing the most advanced state-of-the-art development. Following is a summary of engineering features made possible by these advances in microphone manufacture:

- (1) High sensitivity for small size (minimum diameter available is as small as 7 mm).
- (2) The light weight of the diaphragm assures higher fidelity.
- (3) Noise from any possible vibration is minimized.
- (4) Use of the IC further minimizes noise (3 microvolts at 20 - 10,000 Hz) and insures greater reliability.
- (5) The dynamic range is very wide (92dB or more).

Complete Spare Parts List for TC-120 (UL & E)

(UL: for USA)
(E: Standard Model)

I. MECHANICAL PARTS

SEPT. 1969

<u>Part No.</u>	<u>Description</u>	<u>Unit Price</u>
X-34620-01	Cabinet Ass'y, upper part (for E) -----	
X-34620-02	Cabinet Ass'y, lower part -----	
X-34620-03	Knob Ass'y, vol. control -----	
X-34620-06	Base Plate Ass'y -----	
X-34620-09	Pinch Roller Ass'y -----	
X-34620-11	Base Plate Ass'y, head -----	
X-34620-12	Pushbutton (D) Ass'y -----	
X-34620-13	Pushbutton (C) Ass'y -----	
X-34620-14	Pushbutton (B) Ass'y -----	
X-34620-15	Pushbutton (A) Ass'y -----	
X-34620-16	Holder (B) Ass'y, pushbutton -----	
X-34620-17	Holder (A) Ass'y, pushbutton -----	
X-34620-18	Pushbutton (E) Ass'y -----	
X-34620-19	Pulley Ass'y, fast forward -----	
X-34620-20	Flywheel (A) Ass'y -----	
X-34620-21	Lever Ass'y, cassette-up -----	
X-34620-22	Brake Ass'y -----	
X-34620-23	Tension Pulley Ass'y -----	
X-34620-24	Tension Boss Ass'y -----	
X-34620-25	Boss (B) Ass'y, bearing -----	
X-34620-26	Boss (A) Ass'y, bearing -----	
X-34620-27	Flywheel (B) Ass'y -----	
X-34620-28	Reel Table Ass'y -----	
X-34620-29	Lever Ass'y, record switch -----	
X-34620-30	Plate Ass'y, eject lever holding -----	
X-34620-31	Bracket Ass'y, thrust -----	
X-34620-32	Lever Ass'y, record preventing -----	
X-34620-34	Holder Ass'y, pushbutton -----	
X-34620-36	Lever Ass'y, cassette lid lock -----	
X-34620-38	Balancer Ass'y -----	
X-34623-01	Cabinet Ass'y, upper part (for UL) -----	
X-34623-02	Panel Ass'y, front -----	
3-462-091	Lid, battery -----	
3-462-125	Lever, cassette lid opening -----	
3-462-126	Lever (B), eject -----	
3-462-127	Lever (A), cassette-up -----	
3-462-128	Lever, fast forward -----	

<u>Part No.</u>	<u>Description</u>	<u>Unit Price</u>
3-462-129	Pulley, motor -----	
3-462-130	Holder, motor -----	
3-462-131	Belt, tape index counter -----	
3-462-132	Belt (A), rubber -----	
3-462-133	Belt, tension -----	
3-462-134	Plate, tape index counter -----	
3-462-136	Collar -----	
3-462-137	Plate (C), shield -----	
3-462-138	Plate (B), shield -----	
3-462-139	Plate (A), shield -----	
3-462-140	Spacer -----	
3-462-141	Plate, jack shield -----	
3-462-142	Spring, tension arm -----	
3-462-143	Spring -----	
3-462-144	Spring -----	
3-462-145	Cushion, meter -----	
3-462-146	Plate, shield -----	
3-462-147	Spacer -----	
3-462-149	Holder, printed circuit board -----	
3-462-150	Lever, recording -----	
3-462-151	Holder (C), cassette -----	
3-462-152	Plate, slide; fast forward -----	
3-462-154	Plate, slide; handle -----	
3-462-092	Plate, button, eject -----	
3-462-093	Cloth, lower cabinet -----	
3-462-094	Spacer, rec./p.b. head -----	
3-462-095	Spring, pinch roller -----	
3-462-096	Holder (A), cassette -----	
3-462-097	Spring -----	
3-462-098	Spring -----	
3-462-100	Shaft, pushbutton -----	
3-462-101	Plate, pushbutton lock -----	
3-462-102	Spring, button (A) -----	
3-462-103	Spring, button (B) -----	
3-462-104	Limiter, pushbutton -----	
3-462-105	Button, eject -----	
3-462-106	Spring, button, eject -----	
3-462-107	Spring -----	
3-462-108	Spring -----	
3-462-198	Spring -----	
3-462-110	Felt, friction -----	
3-462-111	Clutch, fast forward -----	

2/10 (TC-120UL & E)

(C1-38)

<u>Part No.</u>	<u>Description</u>	<u>Unit Price</u>
3-462-112	Holder, spring -----	
3-462-113	Spring -----	
3-462-114	Spring, cassette holder -----	
3-462-115	Spring, brake -----	
3-462-116	Arm, tension -----	
3-462-117	Heat Sink -----	
3-462-118	Plate, adjusting; head base plate -----	
3-462-119	Spacer -----	
3-462-120	Cap, reel -----	
3-462-121	Holder (B), cassette -----	
3-462-122	Guide (B) -----	
3-462-123	Post, lower cabinet holding screw -----	
3-462-124	Holder, variable resistor -----	
3-462-158	Handle, carrying -----	
3-462-160	Spacer -----	
3-462-161	Holder, speaker -----	
3-462-162	Spring -----	
3-462-173	Cushion (A), motor -----	
3-462-174	Cushion (B), motor -----	
3-462-178	Spacer, volume & tone control knob -----	
3-462-179	Post, cabinet holding screw -----	
3-462-180	Plate, leaf switch -----	
3-462-183	Holder (B), carrying handle -----	
3-462-184	Holder (C), carrying handle -----	
3-462-185	Spacer, nylon; carrying handle -----	
3-462-190	Spring, balancer; cassette button -----	
3-462-191	Holder, microphone -----	
3-462-192	Washer, carrying handle -----	
3-462-193	Plate (D), shield -----	
3-462-194	Screw, thrust -----	
3-462-195	Retainer, thrust -----	
3-462-197	Spring, plate -----	
3-462-198	Spring, tension -----	
3-462-199	Spring -----	
3-462-301	Label, battery caution (for UL) -----	
3-462-302	Label, specification (for UL) -----	
3-462-601	Label, specification (for E) -----	
3-423-147	Washer -----	
3-423-132	Absorber, vibration -----	
3-423-136	Absorber, vibration -----	
3-434-021	Washer, nylon -----	
3-434-047	Washer, nylon -----	

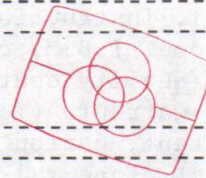
<u>Part No.</u>	<u>Description</u>	<u>Unit Price</u>
3-434-101	Drum, friction -----	
3-434-104	Holder, flywheel boss -----	
3-434-119	Felt, tension -----	
3-440-288	Washer, friction drum -----	
3-434-141	Spring, rec./p.b. head adjusting -----	
3-434-147	Spring -----	
3-434-158	Insulator Fiber -----	
3-434-159	Protector, fiber -----	
3-434-162	Terminal Strip -----	
3-443-054	Absorber, vibration -----	
3-432-191	Absorber, vibration -----	
3-446-154	Spring -----	
3-446-155	Spring -----	
3-440-288	Washer, tension -----	
3-455-059	Cushion -----	
3-405-458	Washer, flywheel -----	
3-450-048	Heat Sink -----	
3-450-602	Cover, fuse -----	
3-453-132	Cover, head -----	
Y-20410-41-1	Counter, tape index; mini-tape -----	
3-467-018	Label, eyecatcher (for UL) -----	
3-701-030	Self Label, serial.No. stamped -----	
3-434-188	Felt -----	
3-434-189	Absorber, vibration -----	
3-434-205	Absorber, vibration -----	
3-434-219	Cushion B -----	
3-434-401	Spacer -----	
3-434-218	Cushion A -----	

Screw, Washer & Nut

Screw

7-621-255-25	(+) P 2 x 4 -----
7-621-255-32	(+) P 2 x 5 -----
7-621-255-35	(+) P 2 x 5 -----
7-621-255-52	(+) P 2 x 8 -----
7-621-255-72	(+) P 2 x 12 -----
7-621-259-25	(+) P 2.6 x 4 -----
7-621-259-35	(+) P 2.6 x 5 -----
7-621-259-39	(+) P 2.6 x 5 -----

<u>Part No.</u>	<u>Description</u>	<u>Unit Price</u>
7-621-259-55	(+) P 2.6 x 8 -----	
7-621-281-05	(+) P 2.6 x 9 -----	
7-621-555-45	(+) K 2 x 6 -----	
7-621-561-48	(+) K 3 x 6 -----	
7-621-770-71	(+) B 2.6 x 6 -----	
7-628-154-15	(+) P 2.6 x 6 with Spring Washer -----	
7-682-145-01	(+) P 3 x 4 -----	
7-682-147-01	(+) P 3 x 6 -----	
7-682-148-01	(+) P 3 x 8 -----	
	<u>Set Screw</u>	
7-621-710-36	2 x 4 -----	
7-621-714-26	1.7 x 4 -----	
	<u>Steel Ball</u>	
7-671-112-01	2 ϕ -----	
	<u>Spring Washer</u>	
7-623-205-21	2 ϕ -----	
7-623-207-21	2.6 ϕ -----	
7-623-208-27	3 ϕ -----	
	<u>Washer</u>	
7-623-105-15	2 ϕ (Middle) -----	
7-623-107-15	2.6 ϕ (Middle) -----	
7-623-107-25	2.6 ϕ (Large) -----	
7-623-108-15	3 ϕ (Middle) -----	
	<u>Retaining Ring</u>	
7-624-102-01	E-1.5 -----	
7-624-104-01	E-2 -----	
7-624-105-01	E-3 -----	
7-624-109-01	E-5 -----	
	<u>Eyelet</u>	
7-623-660-01	2 ϕ x 3.2 with Terminal Strip -----	



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<u>Part No.</u>	<u>Description</u>	<u>Unit</u> <u>Price</u>
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Lug

7-623-507-01	2.6 ϕ -----	
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Accessories

	Manual, instruction (for UL) -----	
	Manual, instruction (for E) -----	
3-701-031	Envelope, I.B.M. card (for UL) -----	
3-701-034	Card, quality control (for UL) -----	
3-701-035	Card, warranty (for UL) -----	
3-793-044	Important, carton (for UL) -----	
3-793-010	Booklet, tape talk -----	
3-701-020	Bag, check sheet; SS -----	
8-893-106	Tape, demonstration CDE-31 (for E) -----	
8-854-911	Tape, cassette C-60 (for UL) -----	
8-811-950	Microphone, F-95 (for UL) -----	
3-462-177	Case, carrying -----	
3-462-176	Case, accessory -----	
X-37010-18-2	Pen Ass'y, head cleaning (for E) -----	
1-504-034	Earphone, ME-20 -----	
Y-20664-01-1	Control, remote RM-15 -----	
1-528-026	Battery, super UM-2 -----	
1-534-519	Cord, power supply (for UL) -----	
1-534-033	Cord, connection RK-69 -----	
1-534-518	Cord, power supply (for E) -----	
X-34620-35	Band Ass'y, shoulder -----	

Carton

X-34620-33-2	Carton Ass'y (for E) -----	
3-462-168-11	Master Carton, 4 sets (for E) -----	
3-462-169	Cylinder, battery -----	
3-462-170	Cushion, left -----	
3-462-171	Cushion, right -----	
3-827-228	Bag, polyethylene -----	
3-462-603	Bag, polyethylene (for E) -----	
7-633-110	Tape, vinyl -----	

II. ELECTRICAL PARTS

<u>Part No.</u>	<u>Description</u>	<u>Unit Price</u>
<u>Circuit Board (A) Section</u>		
1-539-137-13	Printed Circuit Board (A) -----	
	Transistor 2SC631 Q2 -----	
	" 2SC631 Q1 -----	
	" 2SC633 Q3,4,5,8,9 -----	
	" 2SB495 Q6,7 -----	
	Diode 10D-05 D1,3 -----	
	" 10D-2 D4,5,6,7 -----	
	" 1T-22 D2 -----	
1-423-049	Transformer, driver T1 -----	
1-427-252	Transformer, output T2 -----	
1-433-132	Transformer, bias osc. T3 -----	
1-507-283	Jack, four gang JPM-470 -----	
1-514-254	Switch, rec./p.b. S1 -----	
<u>Adjustable Resistor</u>		
1-221-315	100 k Ω -(B) R37 -----	
<u>Variable Resistor</u>		
1-221-540	10 k Ω -(A) R16,17 -----	
<u>Ceramic Capacitor</u>		
1-101-918	0.001 μ F 25 V +80 -20 % C4,8,40 -----	
<u>Mylar Capacitor</u>		
1-105-821-12	0.001 μ F 50 V MFL $\pm$ 20 % C39 -----	
1-105-669-12	0.0047 μ F " " $\pm$ 10 % C6 -----	
1-105-672-12	0.0082 μ F " " " C31 -----	
1-105-673-12	0.01 μ F " " " C2 -----	
1-105-677-12	0.022 μ F " " " C33 -----	
1-105-677-12	0.022 μ F " " " C15 -----	
1-105-680-12	0.039 μ F " " " C32 -----	
1-105-672-12	0.0082 μ F " " $\pm$ 20 % C27,28 -----	
1-105-679-12	0.033 μ F " " $\pm$ 10 % C22 -----	
1-105-827-12	0.0033 μ F " " $\pm$ 20 % C47 -----	

<u>Part No.</u>	<u>Description</u>	<u>Unit Price</u>
<u>Silvered Mica Capacitor</u>		
1-107-107	10 pF ± 10 %	C7 -----
1-107-123	47 pF "	C4,10,14,41,42,43,44, 45 -----
1-107-141	270 pF "	C23 -----
<u>Electrolytic Capacitor</u>		
1-121-344	3.3 μ F 25 V ± 150 -10 %	C30 -----
1-121-281	4.7 μ F " ± 100 -10 %	C9 -----
1-121-347	10 μ F 16 V "	C25 -----
1-121-347	10 μ F " "	C12,17,37,38 -----
1-121-510	22 μ F 6.3 V "	C3 -----
1-121-284	33 μ F " "	C1,21 -----
1-121-350	33 μ F " "	C26 -----
1-121-287	47 μ F 3.15 V "	C11,13 -----
1-121-353	47 μ F 16 V "	C34 -----
1-121-291	100 μ F 6.3 V "	C20 -----
1-121-295	220 μ F " "	C18 -----
1-121-294	220 μ F " "	C19 -----
1-121-553	470 μ F 4 V ± 150 -10 %	C24 -----
<u>Polyethylene Capacitor</u>		
1-129-276	0.0039 μ F 250 V ± 10 %	C16 -----
<u>Electrolytic Capacitor</u>		
1-121-530	1000 μ F 12 V	C46 -----
<u>Carbon Resistor</u>		
1-242-625	10 Ω 1/4 W ± 10 %	R40 -----
1-242-625	10 Ω " "	R48 -----
1-242-629	15 Ω " ± 5 %	R26 -----
1-242-640	43 Ω " "	R31 -----
1-242-637	33 Ω " ± 10 %	R41 -----
1-242-651	120 Ω " "	R42 -----
1-242-653	150 Ω " "	R6,39 -----
1-242-659	270 Ω " ± 5 %	R27 -----

8/10 (TC-120UL & E)

(C1-38)

<u>Part No.</u>	<u>Description</u>	<u>Unit Price</u>
1-242-661	330 Ω 1/4 W ± 10 %	R34 -----
1-242-665	470 Ω " ± 5 %	R23 -----
1-242-669	680 Ω " ± 10 %	R1 -----
1-242-673	1 k Ω " "	R29 -----
1-242-677	1.5 k Ω " "	R35 -----
1-242-679	1.8 k Ω " ± 5 %	R32 -----
1-242-681	2.2 k Ω " ± 10 %	R30 -----
1-242-683	2.7 k Ω " "	R8,12 -----
1-242-687	3.9 k Ω " ± 5 %	R11 -----
1-242-679	1.8 k Ω " ± 10 %	R46,50 -----
1-242-689	4.7 k Ω " "	R10 -----
1-242-691	5.6 k Ω " "	R15 -----
1-242-695	8.2 k Ω " ± 5 %	R36 -----
1-242-697	10 k Ω " "	R22,38 -----
1-242-703	18 k Ω " "	R5 -----
1-242-707	27 k Ω " "	R20,25 -----
1-242-711	39 k Ω " "	R4 -----
1-242-713	47 k Ω " ± 10 %	R13 -----
1-242-715	56 k Ω " ± 5 %	R3 -----
1-242-715	56 k Ω " ± 10 %	R9 -----
1-242-717	68 k Ω " ± 5 %	R18 -----
1-242-721	100 k Ω " ± 10 %	R2,45 -----
1-242-723	120 k Ω " "	R47 -----
1-244-601	1 Ω " "	R33 -----
1-244-637	33 Ω " "	R14 -----
1-244-647	82 Ω " ± 5 %	R21 -----
1-244-679	1.8 k Ω " ± 10 %	R49 -----
1-244-689	4.7 k Ω " ± 5 %	R24 -----
1-244-691	5.6 k Ω " ± 10 %	R7 -----
1-244-711	39 k Ω " ± 5 %	R19 -----
1-244-641	47 k Ω " ± 10 %	R28 -----

Circuit Board, (B) Section

1-539-138-11	Printed Circuit Board -----	0.07
	<u>Mylar Capacitor</u>	
1-105-845-12	0.1 μ F 50 V C35 -----	0.05

<u>Part No.</u>	<u>Description</u>	<u>Unit Price</u>
	<u>Electrolytic Capacitor</u>	
1-121-529	2000 μ F 12 V C29,36	-----
	<u>Carbon Resistor</u>	
1-244-609	2.2 Ω 1/4W R43,44	-----
1-502-224	Speaker	SP -----
8-828-136-00	Head, erase	EF65-36 -----
8-822-436-00	Head, rec./p.b.	PP68-36 -----
8-834-010-01	Motor	D-010G -----
8-814-190-11)	Electret Condenser Mic C-1002A	-11; Red -----
8-814-190-12)		-12; Black -----
1-441-487	Transformer, power	T4 (for E) -----
1-441-538	Transformer, power	T4 (for UL) -----
1-509-324	Connector, 4P with S.W., power	CNJ -----
1-514-266	Switch, leaf	S2 -----
1-514-334	Switch, slide	S3 (for E) -----
1-514-544	Pole, end sensing	-----
1-514-583	Switch, leaf	S4 -----
1-532-129	Fuse 0.2A (for E)	-----
1-533-007	Holder fuse (for E)	-----
1-524-049	Meter, level	-----

2-3. Anti-Wow Mechanism

Many portable tape recorders suffer from a sensitivity to physical movements during use. When these recorders are rotated in certain directions, the gyroscopic effects on the flywheel produce changes in the tape speed causing severe "wow".

In the SONY Model TC-120, the ingenious use of TWO flywheel (Fig. 2-1) provides superior stability against such rotational sensitivity. The two flywheels are driven by opposite sides of the same belt and thus turn in opposite directions. Rotation of the

recorder causes *equal but opposite* gyroscopic effects on each flywheel and these equal-but-opposite forces neutralize one another. The motor lies in a different plane from that of the flywheels. The entire recorder is therefore amazingly free from "wow" effects of normal handling and movement.

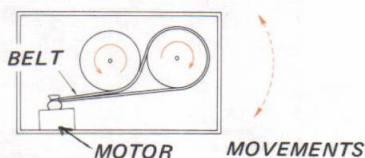
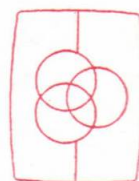
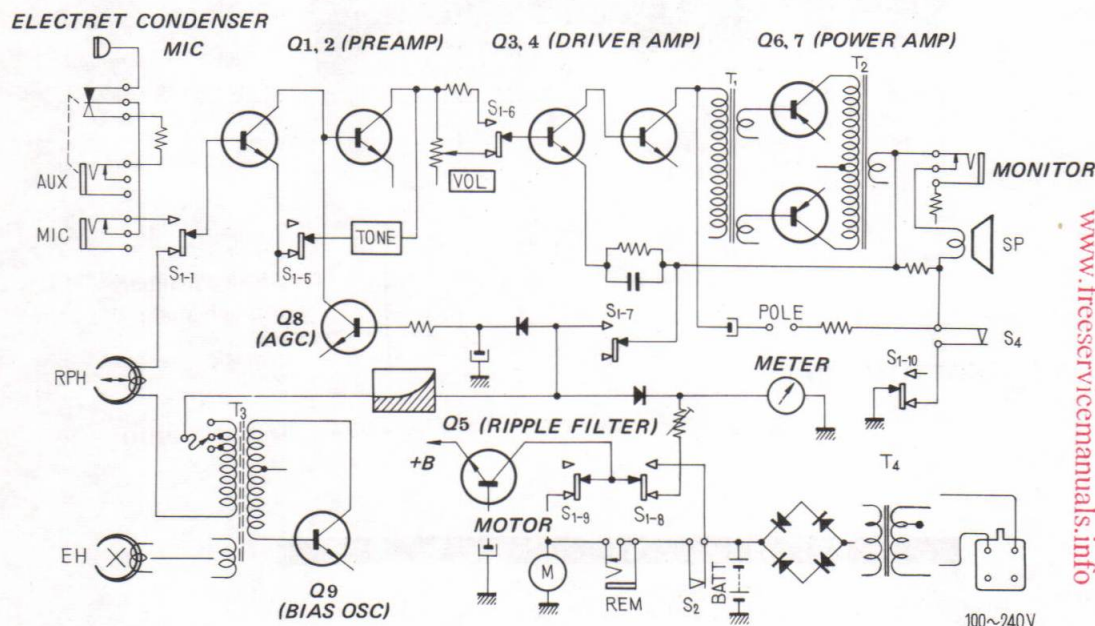


Fig. 2-1

3. BLOCK DIAGRAM



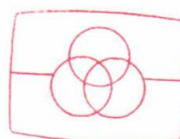
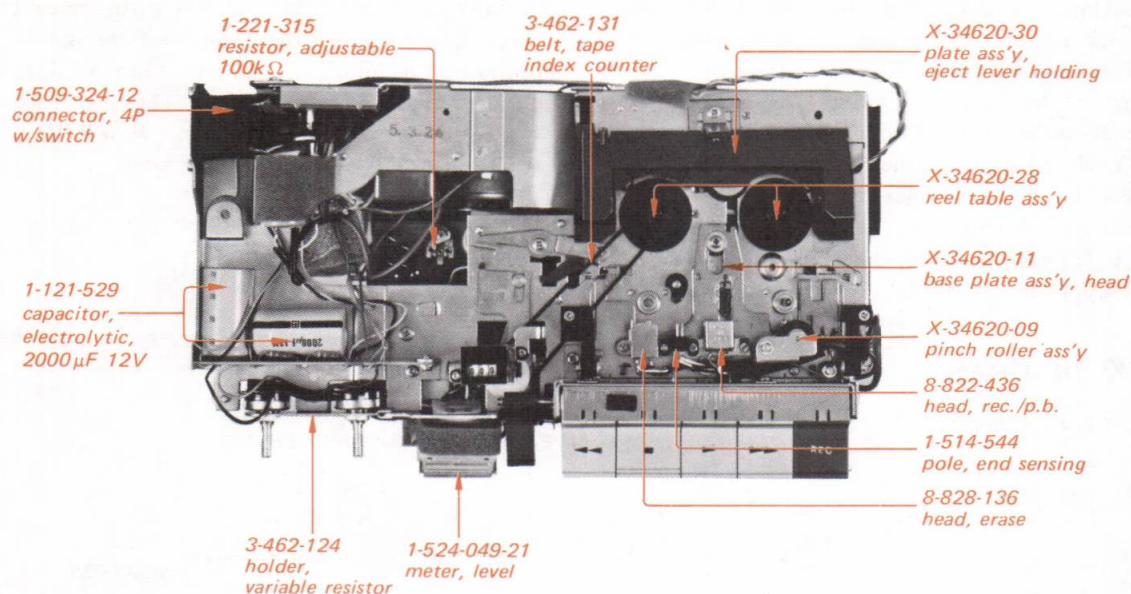
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4. CABINET -TOP VIEW-



5. CHASSIS –TOP VIEW–

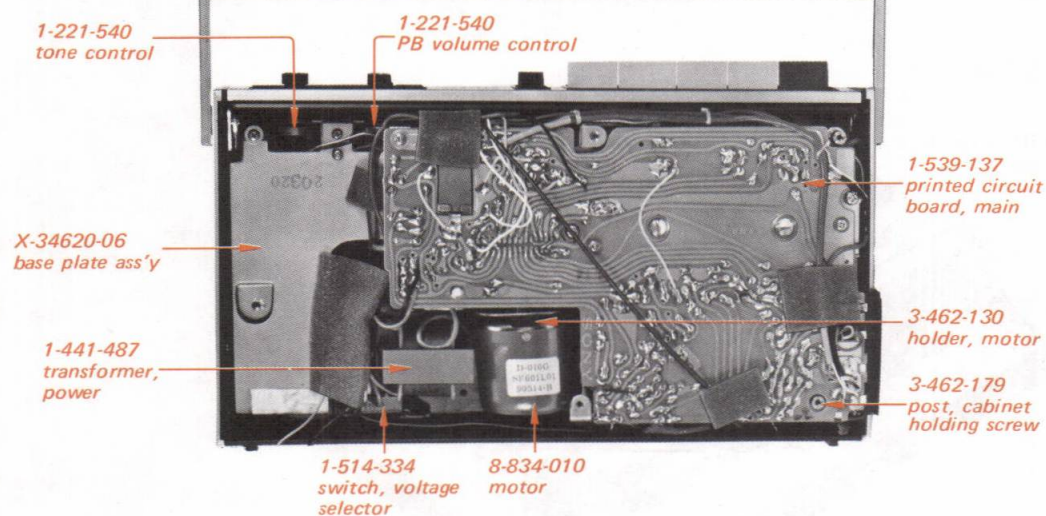


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6. CHASSIS –BOTTOM VIEW–

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7. DISASSEMBLY

7-1. Lower Cabinet Removal

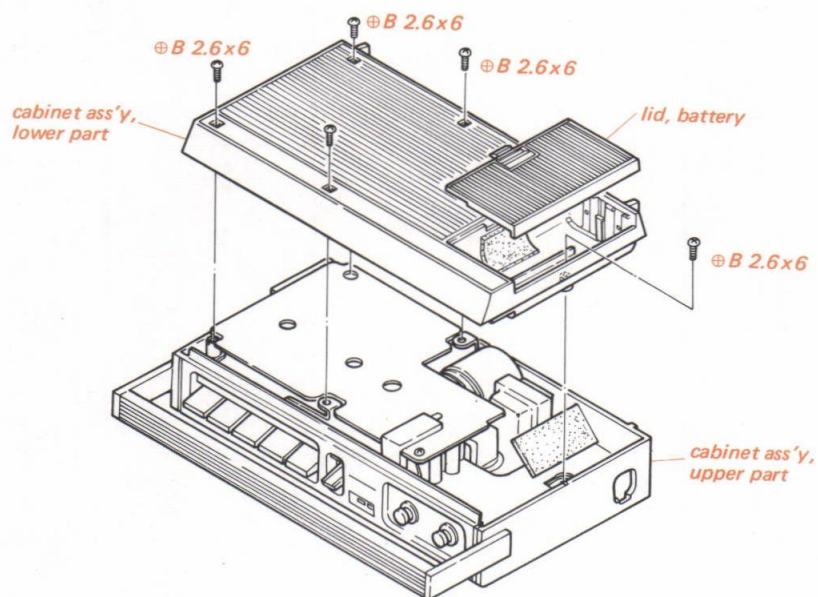


Fig. 7-1 Lower cabinet removal

7-2. Upper Cabinet Removal

Before removing upper cabinet, unsolder following lead wires on the main circuit board.

(1) shielded wire coming from speaker terminals.

(2) lead wire (black) coming from electret condenser microphone.

(3) shielded wire coming from electret condenser microphone.

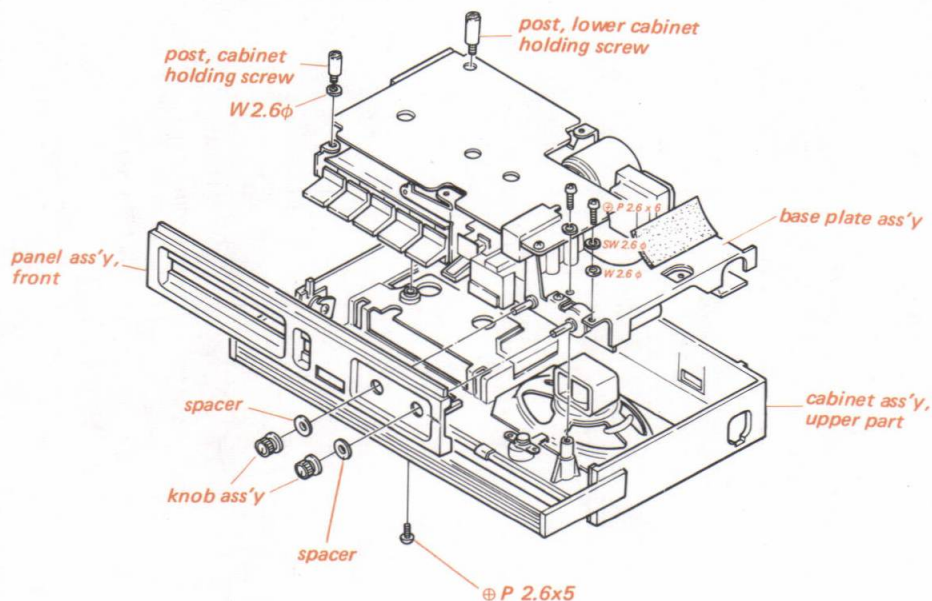
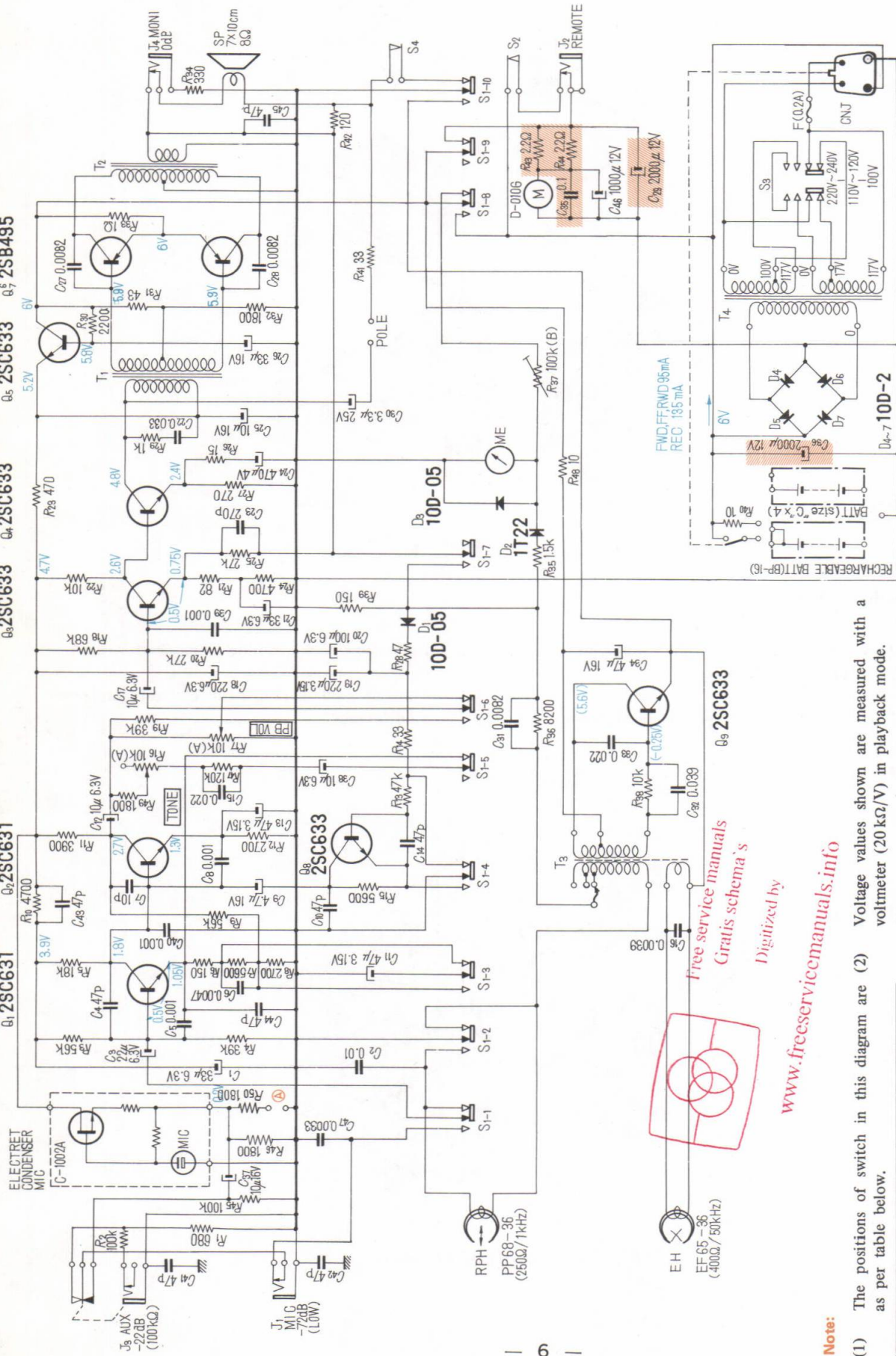


Fig. 7-2 Upper cabinet removal

Q_1 2SC631 Q_2 2SC631 Q_3 2SC633 Q_4 2SC633 Q_5 2SC633 Q_6 2SB495



In using electret condenser microphone marked in red paint on side of case, connect between marked with (A) Parts in oblique line are mounted on sub printed circuit board.

Voltage values shown are measured with a voltmeter ($20\text{ k}\Omega/\text{V}$) in playback mode.

Voltage values in parentheses are for record mode. Variations may be noted because of normal production tolerances.

(3) All resistors and capacitors are rated in Ω and μF respectively unless otherwise specified.

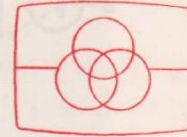
Note:

- (1) The positions of switch in this diagram are (2) as per table below.

Switch No.	Description	Position
S1	REC/PB Switch	playback
S2	Power Switch	ON
S3	Voltage Selector Switch	100V
S4	Muting Switch	ON only in record mode

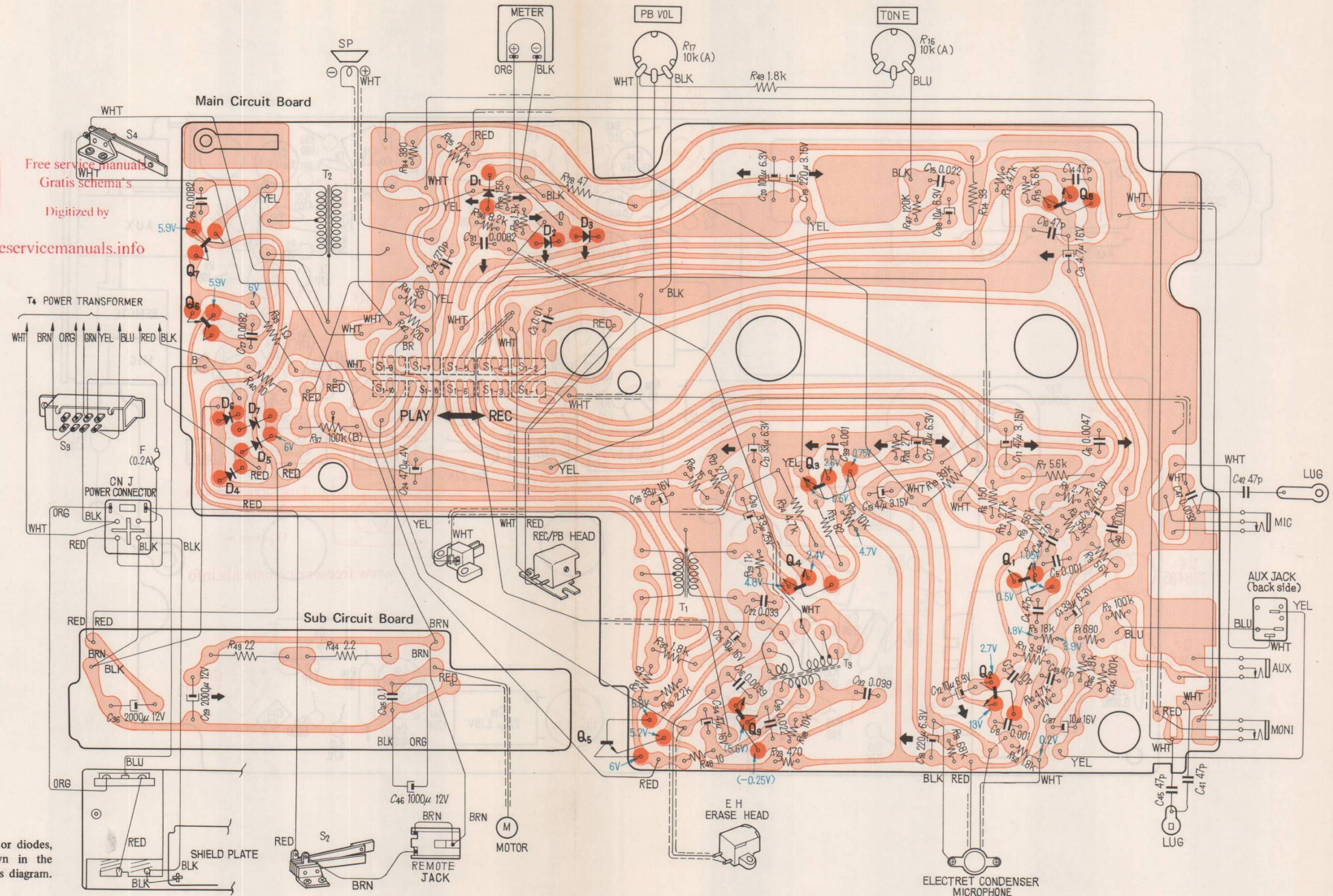
9. MOUNTING DIAGRAM

- Conductor side -

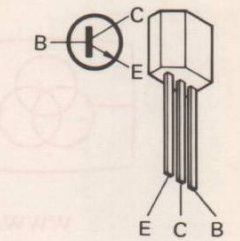
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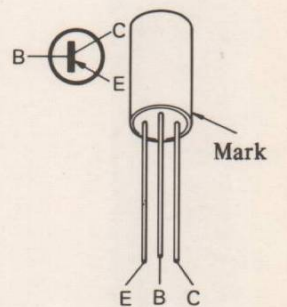
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Q1, 2 2SC631
Q3, 4, 5, 8, 9 2SC633



Q6, 7 2SB495



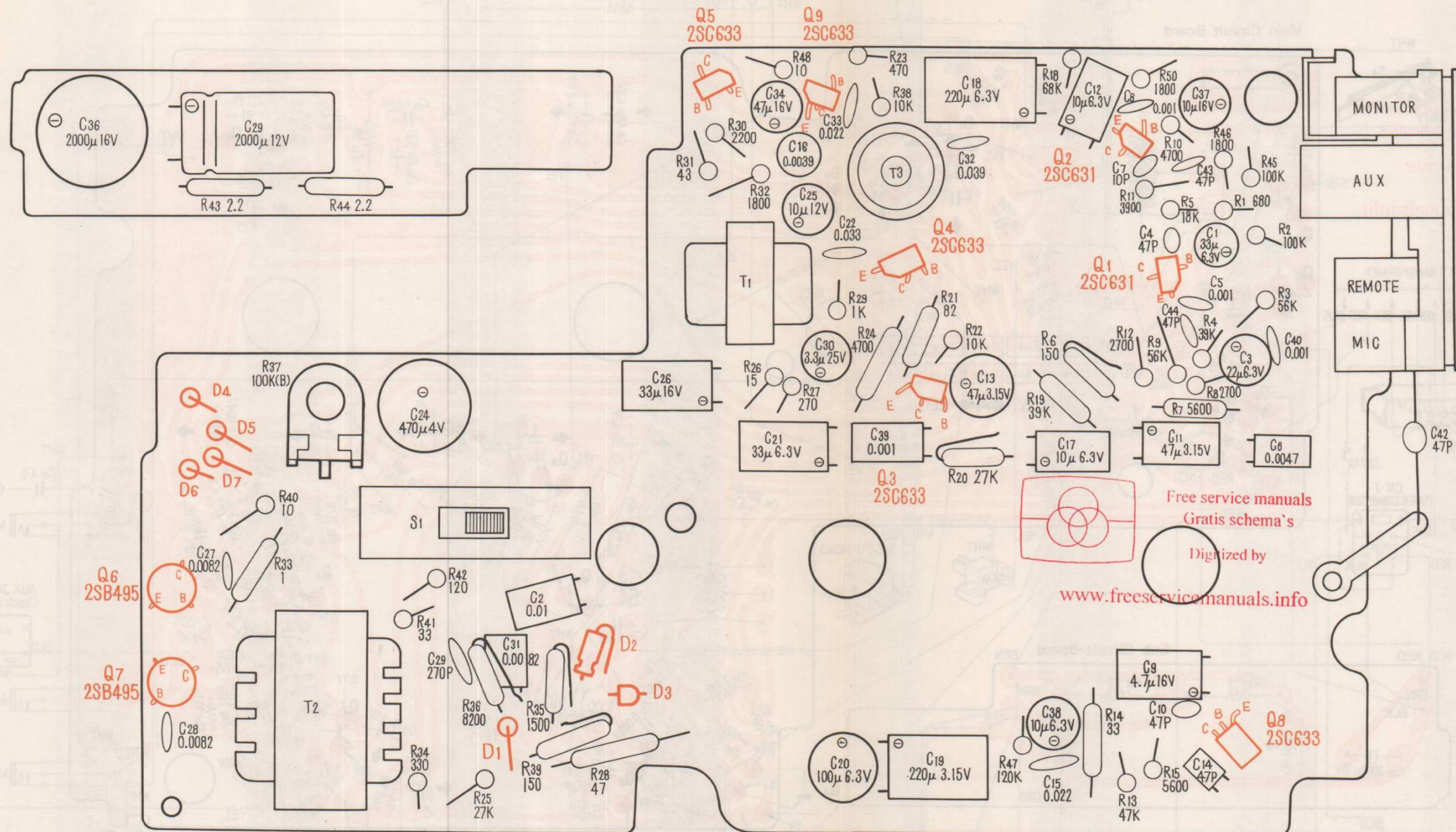
D2 1T22

Cathode

Anode

9. MOUNTING DIAGRAM

— Component side —

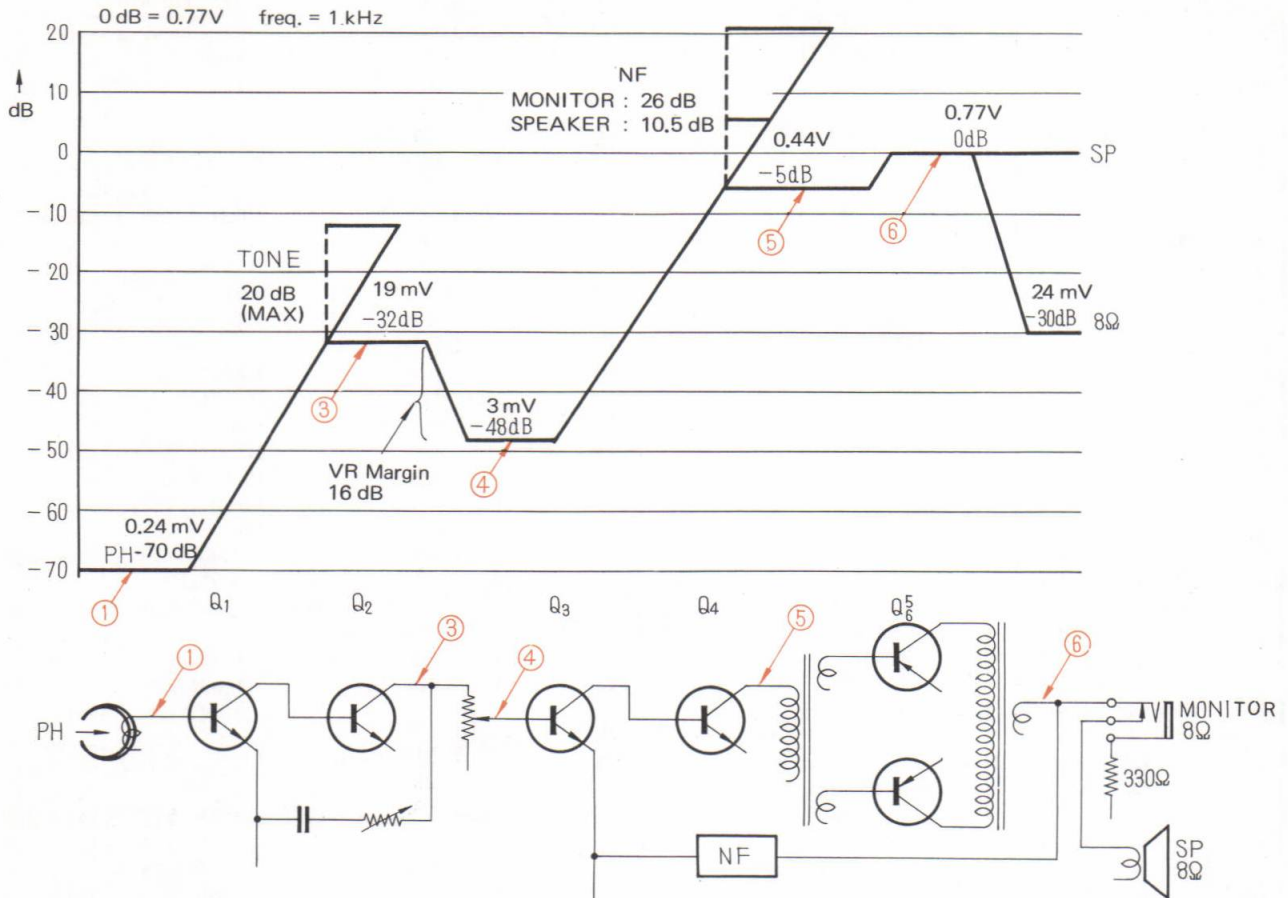


10. ELECTRICAL PARTS LIST

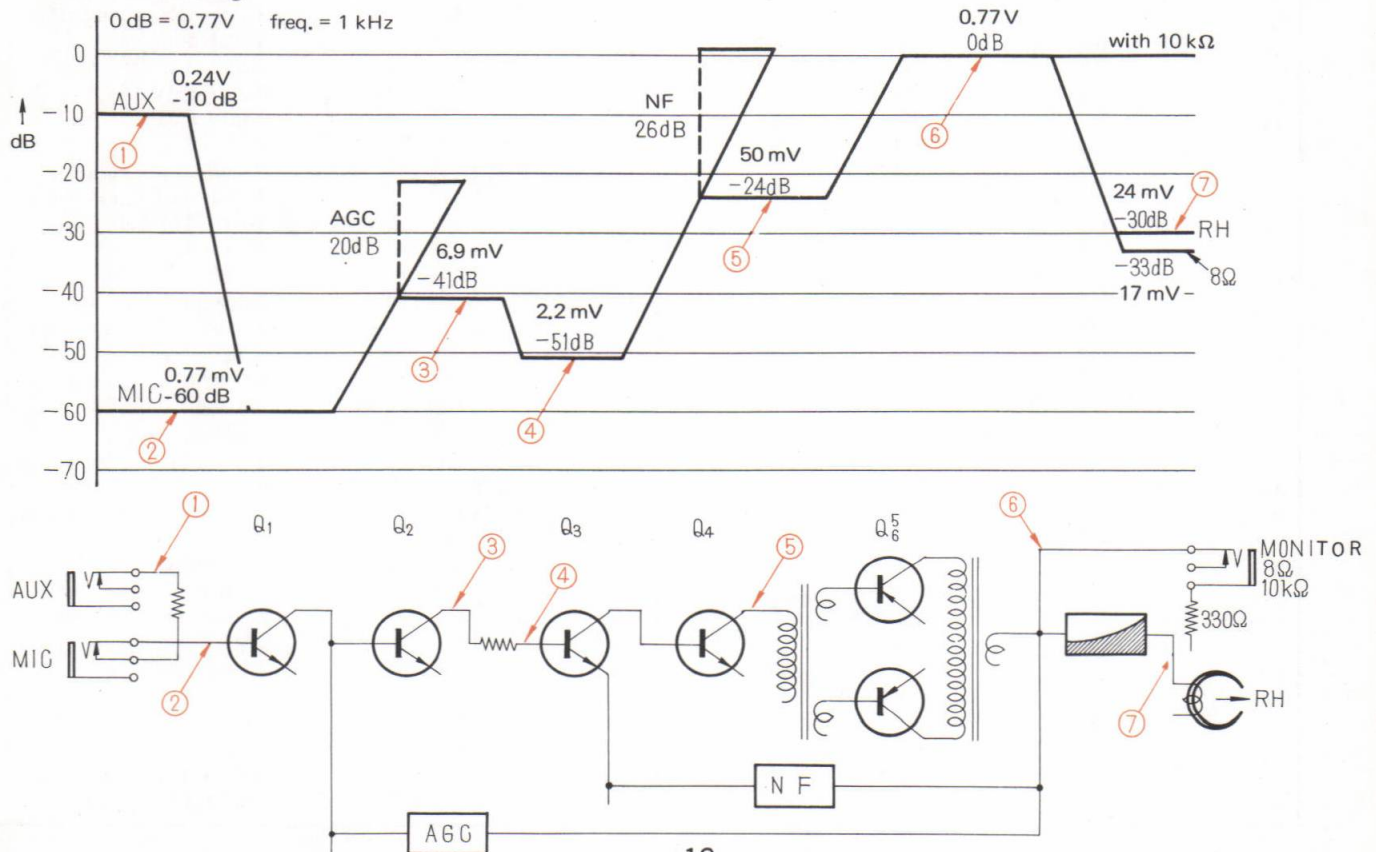
Symbol	Part No.	Description	Symbol	Part No.	Description
Q1		Transistor 2SC631	R31	1-242-640-	Resistor 43Ω ¼W, carbon
Q2		" 2SC631	R32	-679-	" 1.8kΩ " , "
Q3		" 2SC633	R33	1-244-601-	" 1Ω " , "
Q4		" 2SC633	R34	1-242-661-	" 330Ω " , "
Q5		" 2SC633	R35	-677-	" 1.5kΩ " , "
Q6		" 2SB495	R36	-695-	" 8.2kΩ " , "
Q7		" 2SB495	R37	1-221-315-	" 100kΩ (B), adjustable
Q8		" 2SC633	R38	1-242-697-	" 10kΩ ¼W, carbon
Q9		" 2SC633	R39	-653-	" 150Ω " , "
D1		Diode 10D-05	R40	-625-	" 10Ω " , "
D2		" 1T22	R41	-637-	" 33Ω " , "
D3		" 10D-05	R42	-651-	" 120Ω " , "
D4		" 10D-2	R43	1-244-609-	" 2.2Ω " , "
D5		" 10D-2	R44	-609-	" 2.2Ω " , "
D6		" 10D-2	R45	1-242-721-	" 100kΩ " , "
D7		" 10D-2	R46	-679-	" 1.8kΩ " , "
J1		Jack, mic.	R47	-723-	" 120kΩ " , "
J2		" , remote	R48	-625-	" 10Ω " , "
J3	1-507-238-12	" , aux. input 4-gang	R49	1-244-679-	" 1.8kΩ " , "
J4		" , monitor	R50	1-242-679-	" 1.8kΩ " , "
S1	1-514-254-11	Switch, rec./p.b.	C1	1-121-284-	Capacitor 33μF 6.3V, electrolytic
S2	-266-11	" , power	C2	1-105-673-12	" 0.01μF , mylar
S3	-334-11	" , voltage selector	C3	1-121-510-	" 22μF 6.3V, electrolytic
S4	-583-11	" , timing	C4	1-107-123-	" 47pF , mica
POLE	-544-12	Pole, end sensing	C5	1-101-918-	" 0.001μF , ceramic
RPH	8-828-436-00	Head, rec./p.b.; PP68-36	C6	1-105-669-11	" 0.0047μF , mylar
EH	8-822-136-00	Head, erase; EF65-36	C7	1-107-107-	" 10pF , mica
MIC	8-814-190-11	Microphone, electret condenser	C8	1-101-918-	" 0.001μF , ceramic
M	8-834-010-01	Motor	C9	1-121-281-	" 4.7μF 16V, electrolytic
T1	1-423-049-11	Transformer, driver	C10	1-107-123-	" 47pF , mica
T2	1-427-252-11	" , output	C11	1-121-287-	" 47μF 3.15V, electrolytic
T3	1-433-132-13	" , bias osc.	C12	-347-	" 10μF 6.3V , "
T4	1-441-487-12	" , power	C13	-287-	" 47μF 3.15V , "
ME	1-524-049-21	Meter, level	C14	1-107-123-	" 47pF , mica
SP	1-502-224-11	Speaker	C15	1-105-677-12	" 0.022μF , mylar
CNJ	1-509-324-12	Connector, 4P; w/switch	C16	1-129-276-	" 0.0039μF , polyethylene
F	1-532-129-11	Fuse, 0.2A	C17	1-121-347-	" 10μF 6.3V, electrolytic
R1	1-242-669-	Resistor 680Ω ¼W, carbon	C18	-295-	" 220μF 6.3V , "
R2	-721-	" 100kΩ " , "	C19	-294-	" 220μF 3.15V , "
R3	-715-	" 56kΩ " , "	C20	-291-	" 100μF 6.3V , "
R4	-711-	" 39kΩ " , "	C21	-284-	" 33μF 6.3V , "
R5	-703-	" 18kΩ " , "	C22	1-105-679-12	" 0.033μF , mylar
R6	-653-	" 150Ω " , "	C23	1-107-141-	" 270pF , mica
R7	1-244-691-	" 5.6kΩ " , "	C24	1-121-553-	" 470μF 4V, electrolytic
R8	1-242-683-	" 2.7kΩ " , "	C25	-347-	" 10μF 16V , "
R9	-715-	" 56kΩ " , "	C26	-350-	" 33μF 16V , "
R10	-689-	" 4.7kΩ " , "	C27	1-105-672-12	" 0.0082μF , mylar
R11	-687-	" 3.9kΩ " , "	C28	-672-12	" 0.0082μF , "
R12	-683-	" 2.7kΩ " , "	C29	1-121-529-	" 2000μF 12V, electrolytic
R13	-713-	" 47kΩ " , "	C30	-344-	" 3.3μF 25V , "
R14	1-244-637-	" 33Ω " , "	C31	1-105-672-	" 0.0082μF , mylar
R15	1-242-691-	" 5.6kΩ " , "	C32	-680-	" 0.039μF , "
R16	1-221-540-	" 10kΩ (A), variable	C33	-677-	" 0.022μF , "
R17	-540-	" 10kΩ (A), "	C34	1-121-353-	" 47μF 16V, electrolytic
R18	1-242-717-	" 68kΩ ¼W, carbon	C35	1-105-845-12	" 0.1μF , mylar
R19	1-244-711-	" 39kΩ " , "	C36	1-121-529-	" 2000μF 12V, electrolytic
R20	1-242-707-	" 27kΩ " , "	C37	-347-	" 10μF 6.3V , "
R21	1-244-647-	" 82Ω " , "	C38	-347-	" 10μF 6.3V , "
R22	1-242-697-	" 10kΩ " , "	C39	1-105-821-	" 0.001μF , mylar
R23	-665-	" 470Ω " , "	C40	1-101-918-	" 0.001μF , ceramic
R24	1-244-689-	" 4.7kΩ " , "	C41	1-107-123-	" 47pF , mica
R25	1-242-707-	" 27kΩ " , "	C42	-123-	" 47pF , "
R26	-629-	" 15Ω " , "	C43	-123-	" 47pF , "
R27	-659-	" 270Ω " , "	C44	-123-	" 47pF , "
R28	1-244-641-	" 47Ω " , "	C45	-123-	" 47pF , "
R29	1-242-673-	" 1kΩ " , "	C46	1-121-530-	" 1000μF 12V, electrolytic
R30	-681-	" 2.2kΩ " , "	C47	1-105-827-12	" 0.0033μF , mylar

11. LEVEL DIAGRAM

11-1. Playback



11-1. Recording



12. ELECTRICAL ADJUSTMENT

Item	Signal Source	Output Connection	Mode	Adjust	Remarks
1. Head Azimuth Adjustment	SONY alignment tape, P-4-A81	VTVM and 8Ω resistor in parallel to MONITOR jack	playback	head azimuth adjusting screw (See Fig. 12-1)	1. Set volume control and tone control knobs clockwise to the full. 2. Adjust to obtain the maximum reading on VTVM.
2. Meter Level Adjustment	no signal	no connection	playback	R37 (See Fig. 12-2)	1. Apply 4.4V to power supply terminals. 2. Adjust R37 so that the pointer of level meter just indicates the boundary between red portion and black portion.

- Note:**
1. Demagnetize and clean the REC/PB head and the erase head.
 2. After adjustments, apply lock paint to the adjusted parts.
 3. The following test equipment is to be provided for the adjustments.
SONY alignment tape P-4-A81
 8Ω resistor
VTVM
4.4V power supply

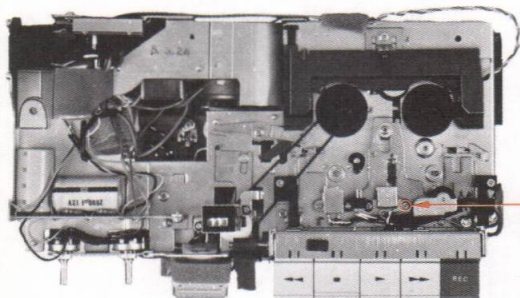


Fig. 12-1 Adjusting position

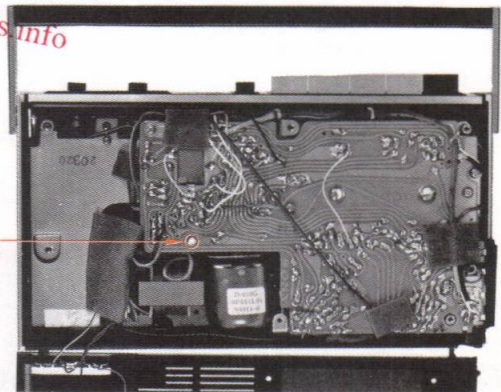


Fig. 12-2 Adjusting position

Hardware Nomenclature

P — Pan Head Screw	⊕	⌢
K — Flat Countersunk Head Screw	⊕	⌢
B — Binding Head Screw	⊕	⌢
RK — Oval Countersunk Head Screw	⊕	⌢
T — Truss Head Screw	⊕	⌢
R — Round Head Screw	⊕	⌢
F — Flat Fillister Head Screw	⊕	⌢
SC — Set Screw	⊕	⌢
E — Retaining Ring (E Washer)	⊕	⌢
W — Washer		
SW — Spring Washer		
LW — Lock Washer		
N — Nut		

— Example —

Type of Slit

P 3 × 10

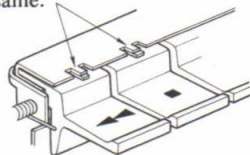
Length in mm (L)

Diameter in mm (D)

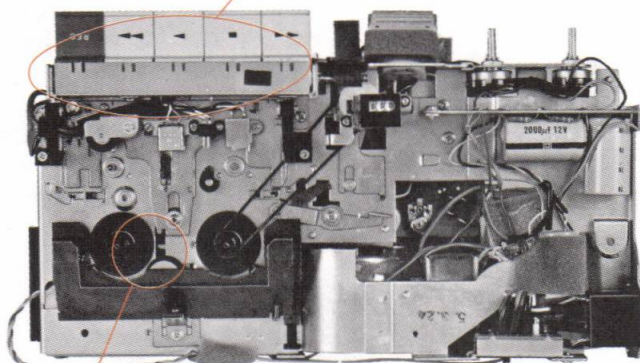
Type of Head

13. MECHANICAL ADJUSTMENT

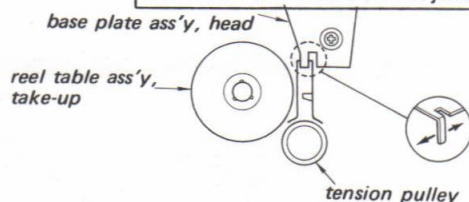
Adjust by bending up or down with a screw driver so that height of all buttons is the same.



Button Height Adjustment

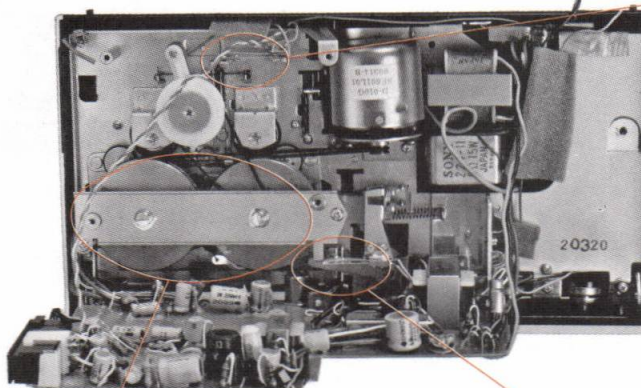


Tension Arm Position Adjustment

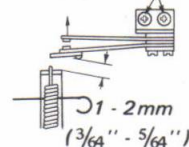


When forward button is pushed gradually, adjust by bending with a pliers so that take-up reel table comes in contact with tension pulley before capstan comes in contact with pinch roller.

Power Switch (S2) Adjustment



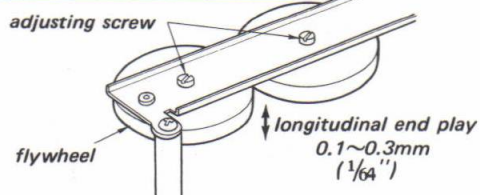
in stop mode
adjusting screw



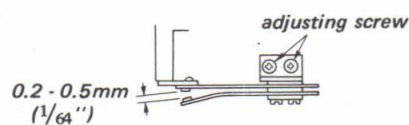
in modes except stop



Flywheel Longitudinal End Play Adjustment



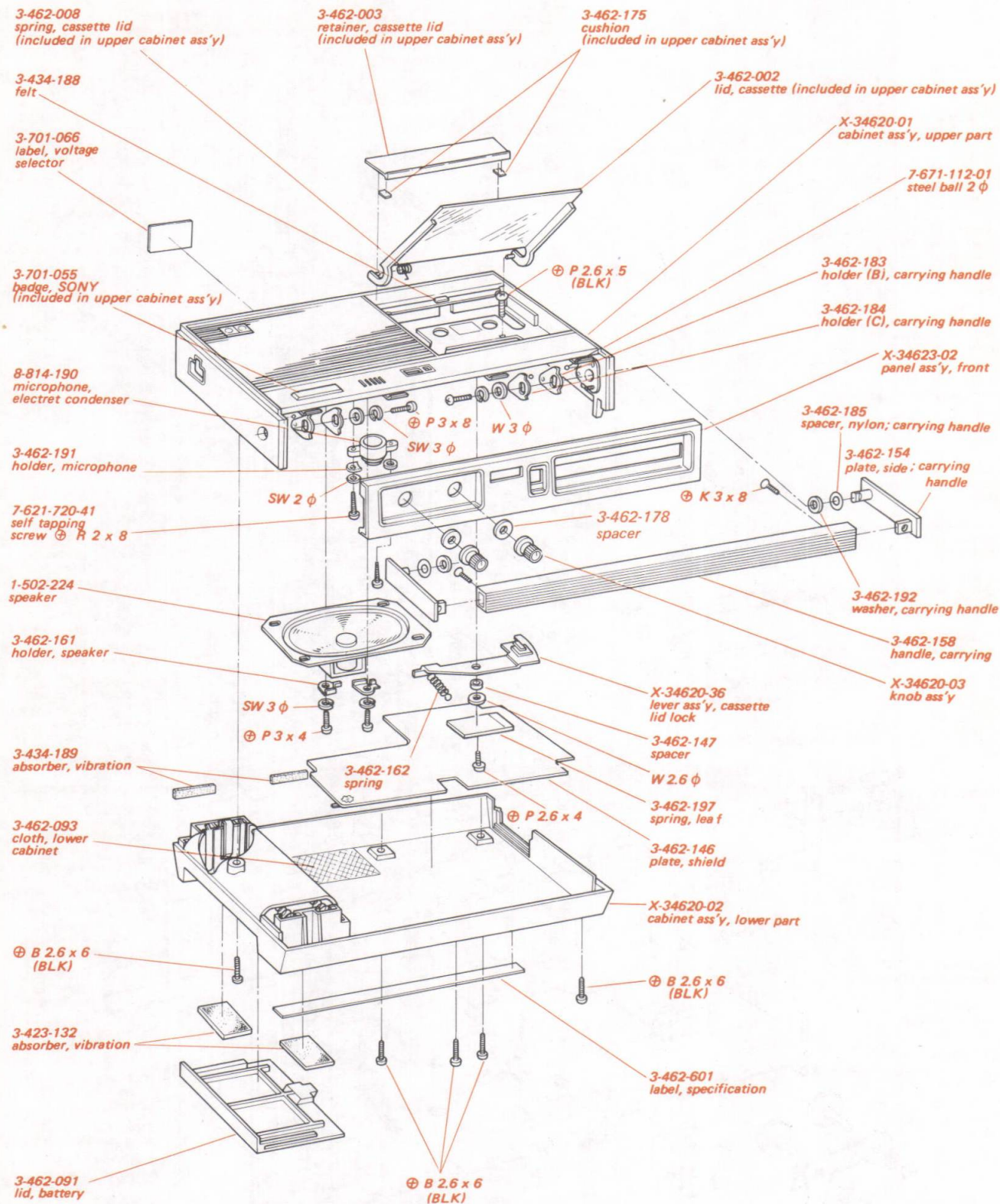
Muting Switch (S4) Adjustment



Under the condition that miserase-preventing lever is not pushed and record button pushed by a finger, loosen the two screws and adjust by positioning the switch.

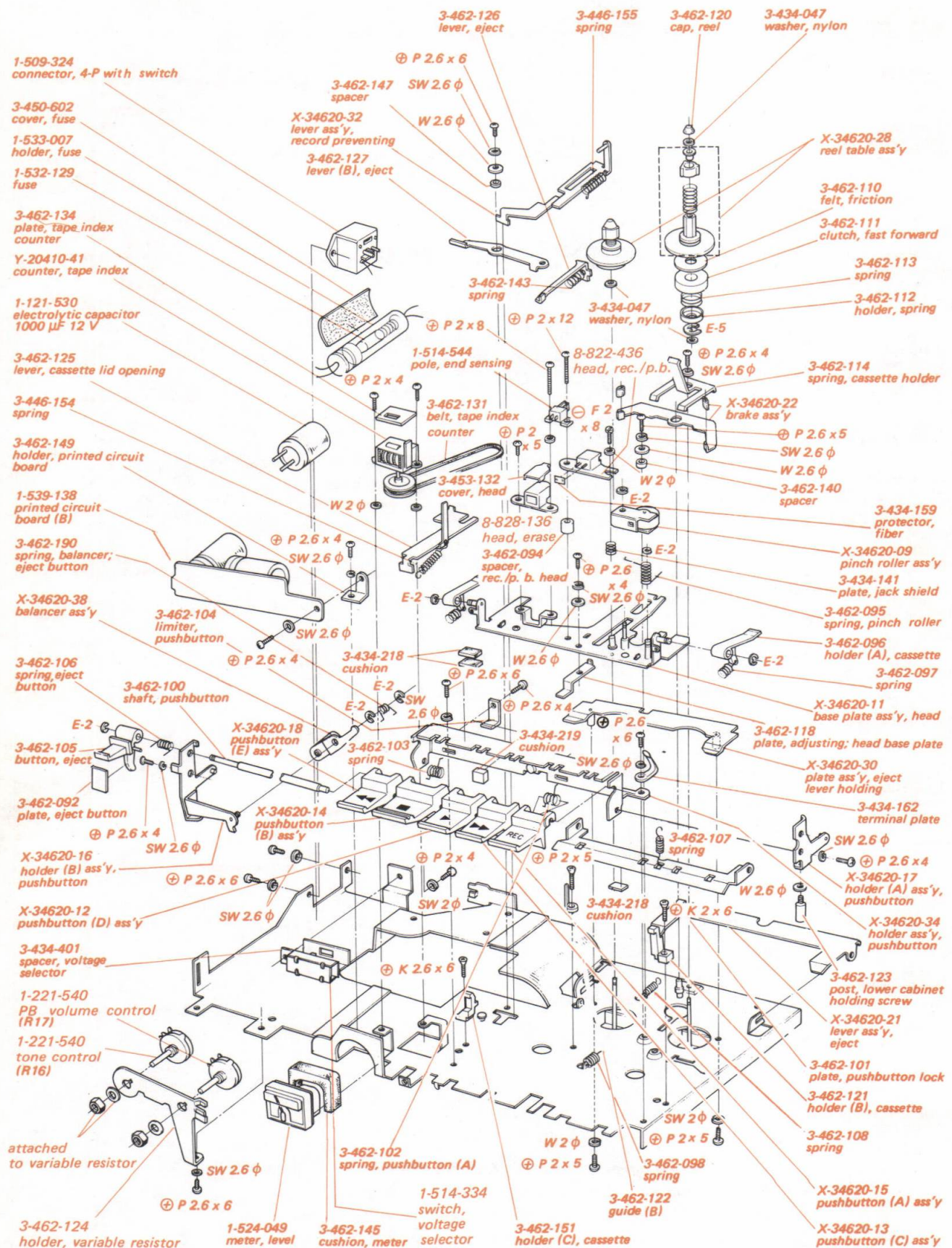
14. EXPLODED VIEW

14-1. Cabinet —top view—

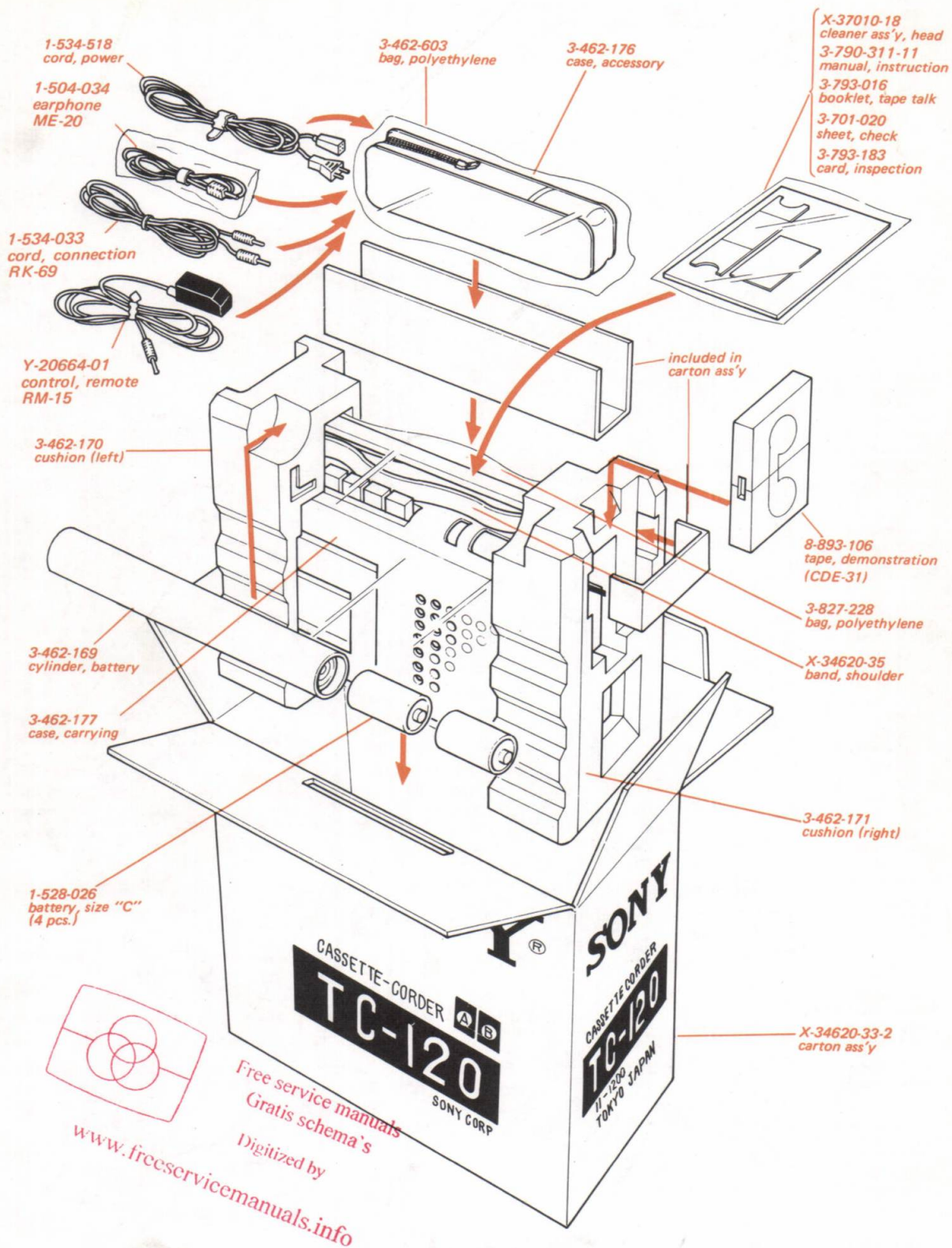


When ordering replacement parts you should use PART NUMBER listed on the Parts List or shown in Exploded Views. The symbol number should not be used for ordering purpose.

14-2. Chassis -top view-



14-4. Packing



SONY CORPORATION