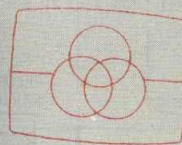


TC-65



E Model
UK Model
USA Model
Canada Model
AEP Model



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CASSETTE-CORDER

SPECIFICATIONS

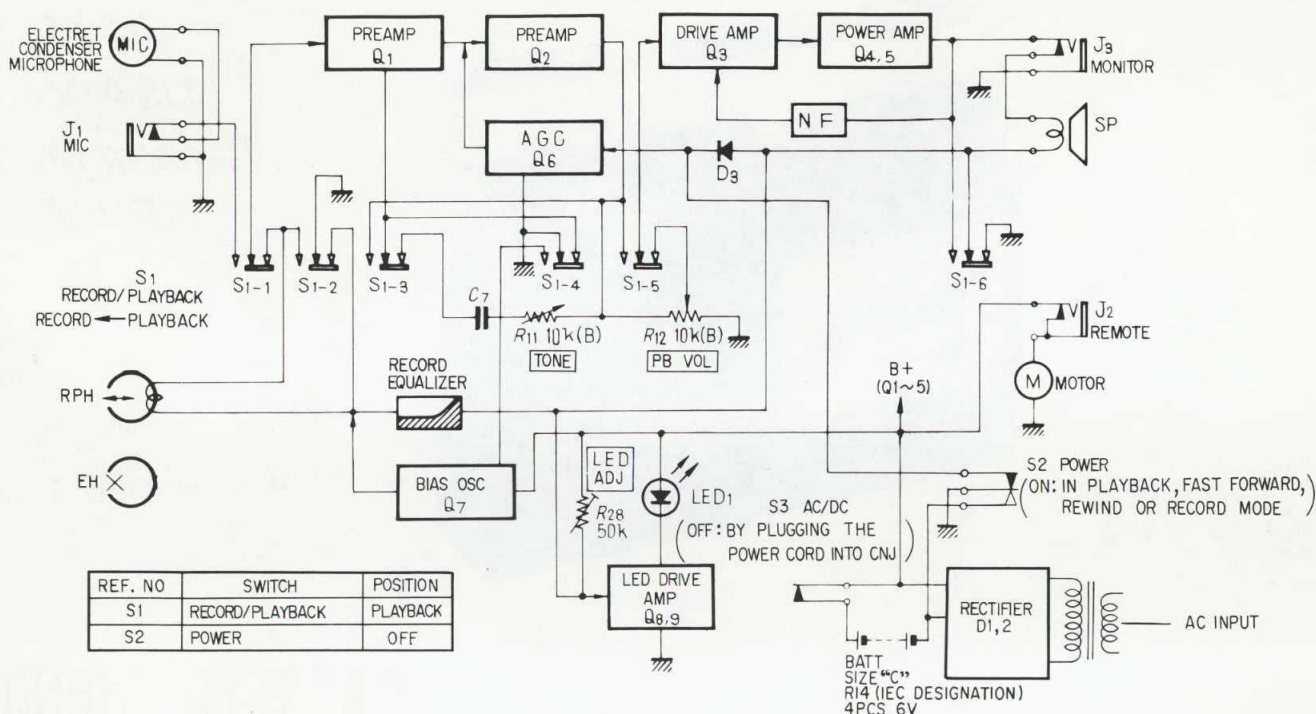
Power requirements:	110, 127, 220 or 240 V ac 50 Hz (AEP Model) 100 ~ 110, 115 ~ 127; 200 ~ 220 or 230 ~ 250 V ac 50/60 Hz (E Model) 240 V ac 50 Hz (UK Model) 120 V ac 60 Hz (USA and Canada Model) 6 V dc, flashlight battery, size "C" 4 pcs (IEC designation R14)	Input:	MIC input (mini jack) . . . 1 sensitivity (0.2 mV) -72 dB for low impedance microphone
Power consumption:	8 W ac	Output:	MONITOR (mini jack) . . . 1 load impedance: 8 Ω (earphone) or more than 10 k Ω
Power output:	1,500 mW, maximum (AEP, E, USA and Canada Model) 1,200 mW, maximum (UK Model)	Battery life:	Approx. 5 hours of continuous recording from the built-in microphone with Sony long-life batteries size "C"
Speaker:	10 cm (4") dia.	Dimensions:	Approx. 265 (w) x 176 (h) x 71 (d) mm Approx. 10½ (w) x 7 (h) x 2⅞ (d) inches including projecting parts and controls
Recording system:	2-track, 1-channel monaural	Weight:	Approx. 2 kg. Approx. 4 lb 7 oz including batteries
Tape speed:	4.8 cm/s (1⅞ ips)		
Fast winding time:	Approx. 1 min. 50 sec. with Sony cassette C-60		
Frequency response:	80 - 8,000 Hz		

SONY
SERVICE MANUAL

SECTION 1

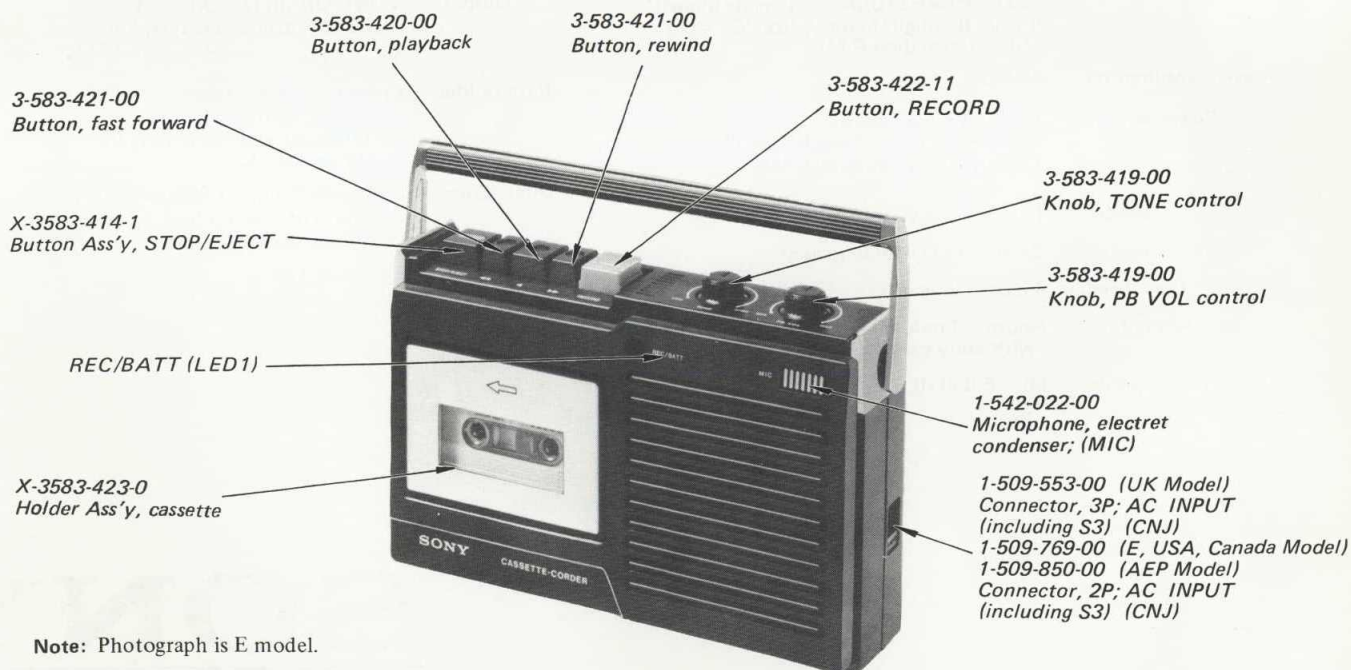
OUTLINE

1-1. BLOCK DIAGRAM

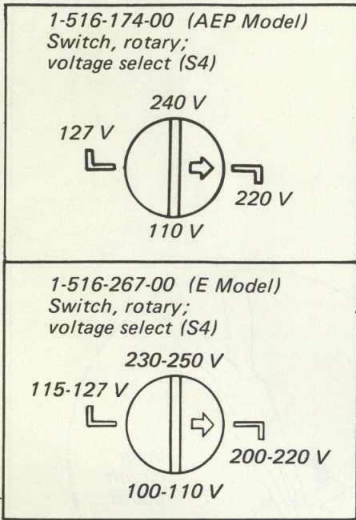


1-2. EXTERNAL VIEWS

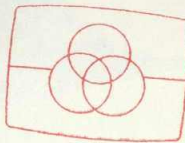
— Front View —



– Rear View –
Note: Photograph is E model.



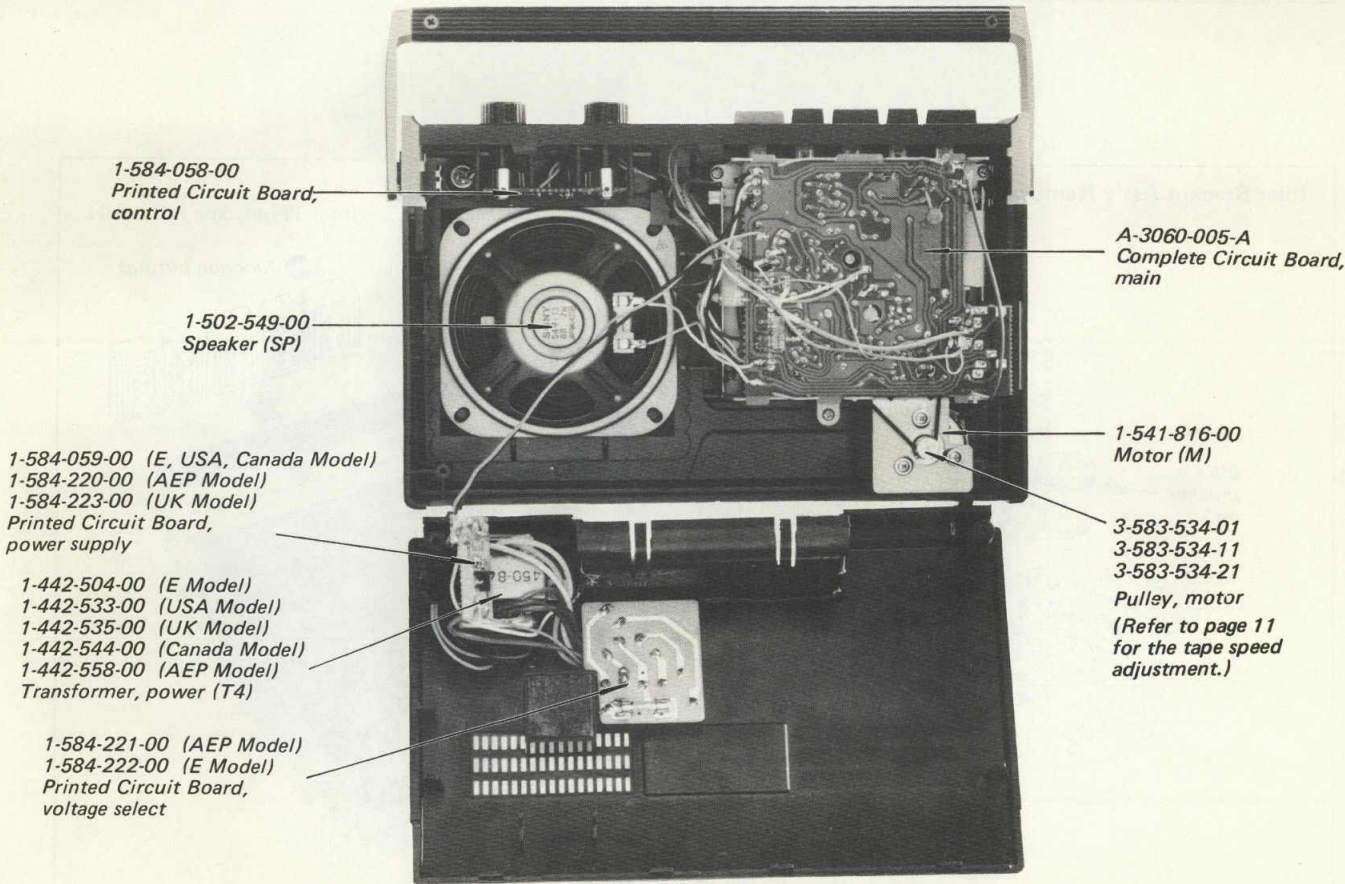
1-507-485-00
Jack, 3-unit
MIC (J1)
REMOTE (J2)
MONITOR (J3)



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1-3. INTERNAL VIEW
Note: Photograph is E model.



1-4. IDENTIFICATION OF SET

TC-65 is classified by the specification label as shown below.

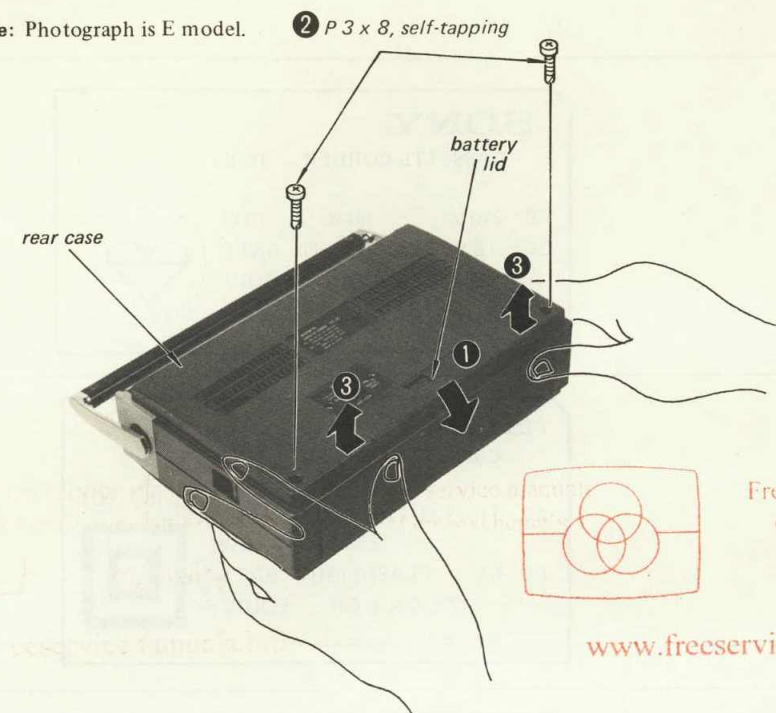
Specification Label

UK Model	SONY® CASSETTE-CORDER TC-65 AC: 240 V 50 Hz 8 W DC: 6 V FLASHLIGHT BATT SIZE C x 4 OR EQUIV MADE IN -----
AEP Model	SONY® CASSETTE-CORDER TC-65 AC: 110, 127, 220, 240 V 50 Hz 6 W DC: 6 V FLASHLIGHT BATT SIZE C x 4 OR EQUIV MADE IN ----- S N D
E Model	SONY® CASSETTE-CORDER TC-65 AC: 100-110, 115-127, 200-220 230-250 V 50/60 Hz 8 W DC: 6 V FLASHLIGHT BATT SIZE C x 4 OR EQUIV MADE IN -----
USA Model	SONY® CASSETTE-CORDER TC-65 AC: 120 V 60 Hz 6 W DC: 6 V FLASHLIGHT BATT SIZE C x 4 OR EQUIV MADE IN -----
Canada Model	SONY® CASSETTE-CORDER TC-65 AC: 120 V 60 Hz 6 W DC: 6 V FLASHLIGHT BATT SIZE C x 4 OR EQUIV MADE IN -----

1-5. DISASSEMBLY

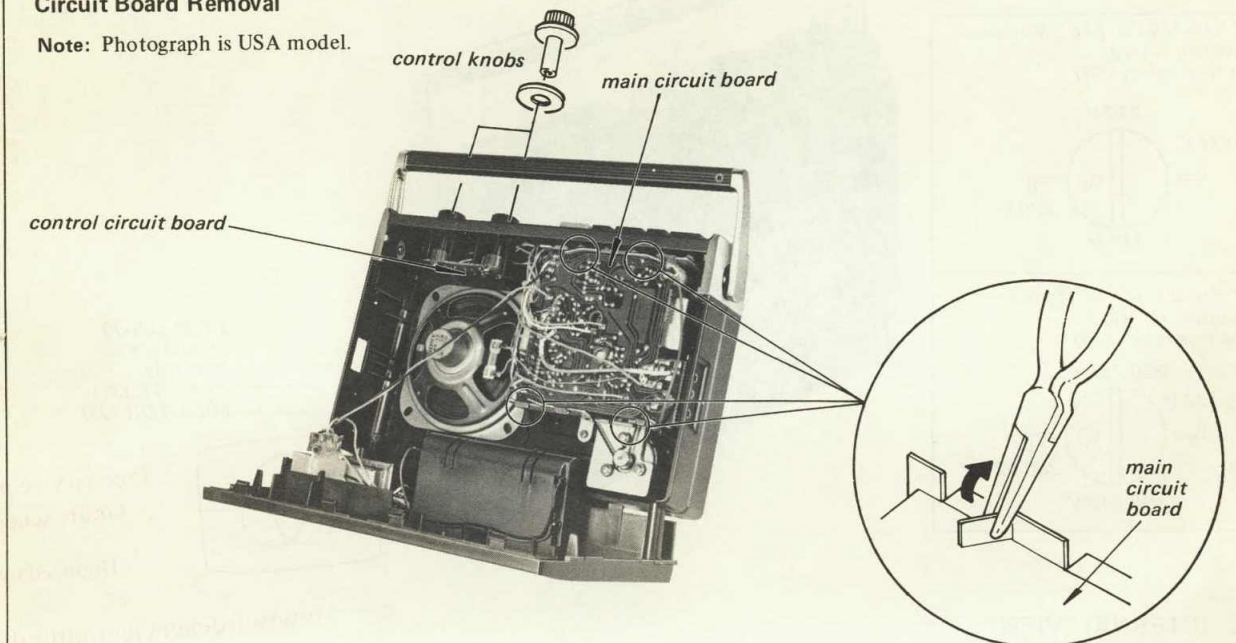
Rear Case Removal

Note: Photograph is E model.



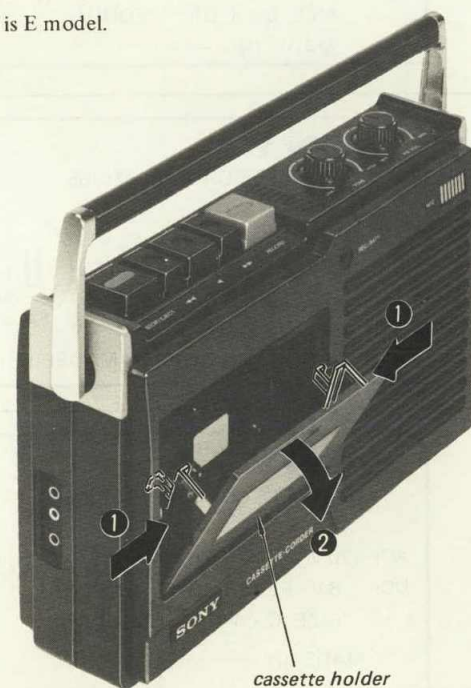
Circuit Board Removal

Note: Photograph is USA model.

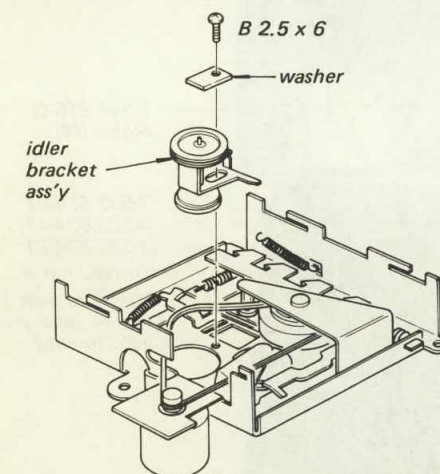


Cassette Holder Removal

Note: Photograph is E model.



Idler Bracket Ass'y Removal

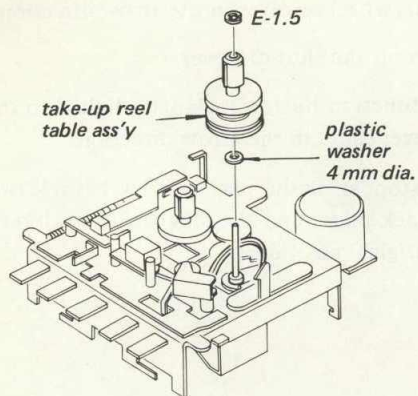


Mechanism Ass'y Removal

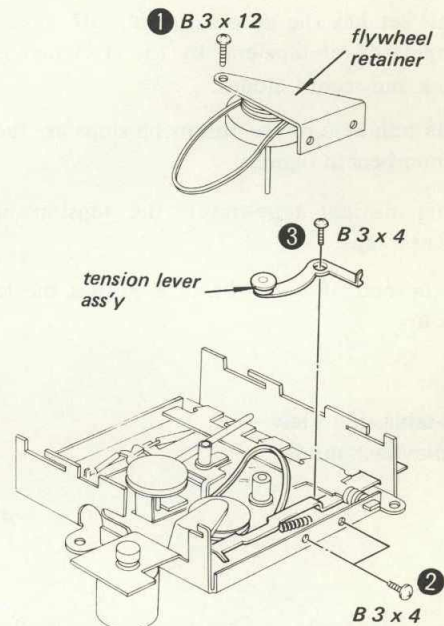
Note: Photograph is E model.



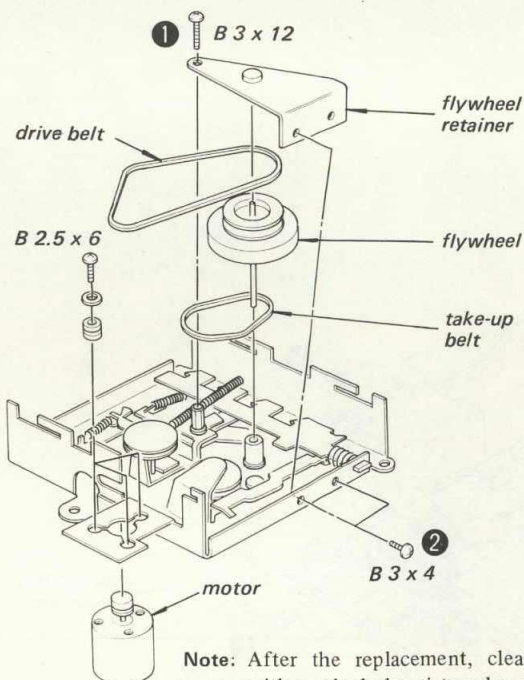
Take-up Reel Table Ass'y Removal



Tension Lever Ass'y Removal



Motor and Belts Removal



Note: After the replacement, clean the belt with an alcohol-moistened swab and then install it without twist.

1-6. AUTOMATIC SHUT-OFF MECHANISM OPERATION

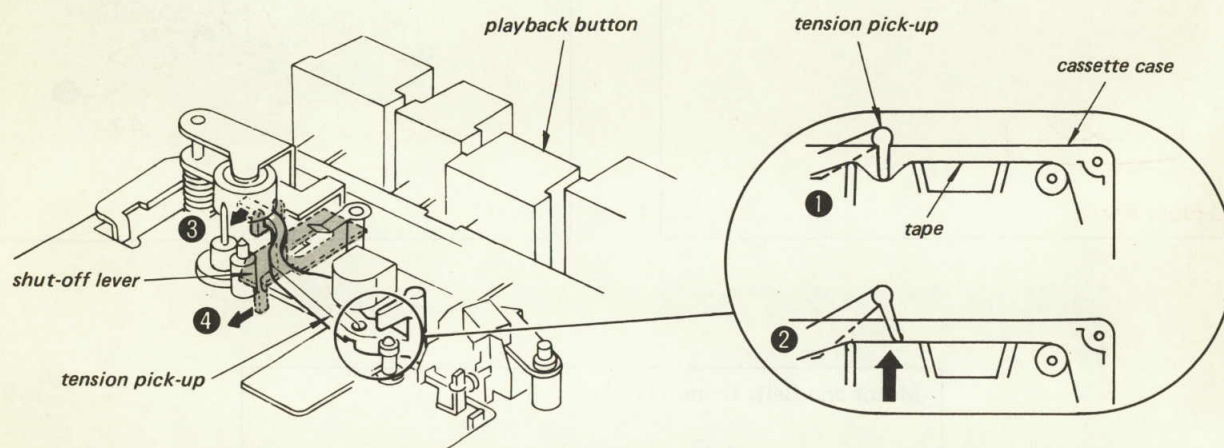
This set has the automatic shut-off mechanism. It is operated at tape-end by the stretched tape in playback and record modes.

The numbers of the following steps are the same as the numbers in figures.

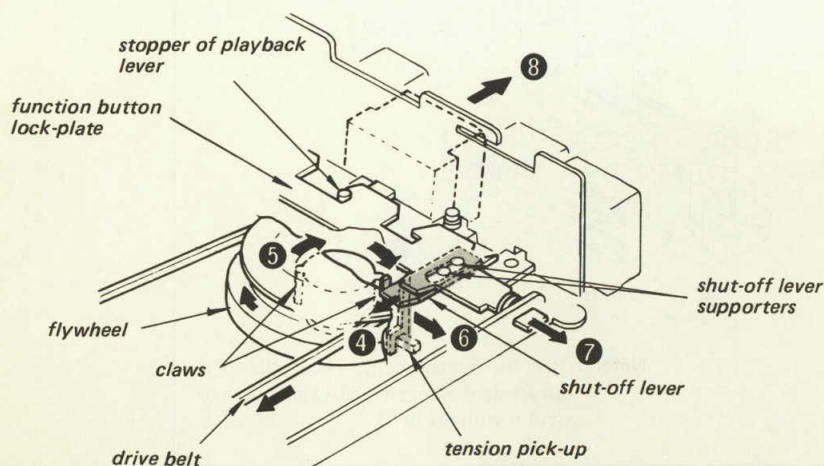
- ①. Under normal tape-travel, the tension pick-up pushes a tape.
- ②. At the end of tape, the tape pushes the tension pick-up.

- ③, ④. The shut-off lever in connection with the tension pick-up moves in the arrow direction.
- ⑤. The flywheel revolves in the arrow direction.
- ⑥. Claws hit the shut-off lever.
- ⑦. The function button lock-plate linked to the shut-off lever slides in the arrow direction.
- ⑧. The stopper of the playback lever is released from the lock plate, and the playback button returns to the original position.

— Reel-table-side View — In playback mode



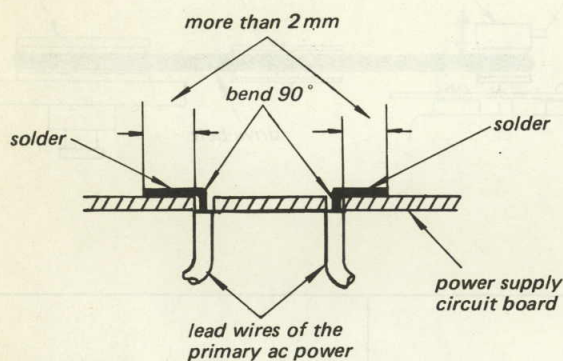
— Flywheel-side View —



1-7. CAUTION FOR REPAIRING OF AC POWER SUPPLY SECTION

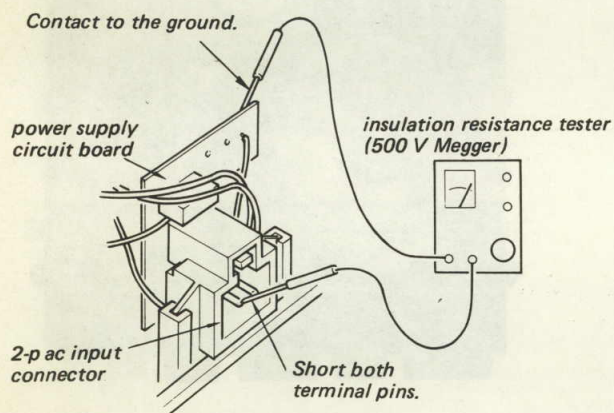
– E and USA model –

I. For Repairing AC Power Supply



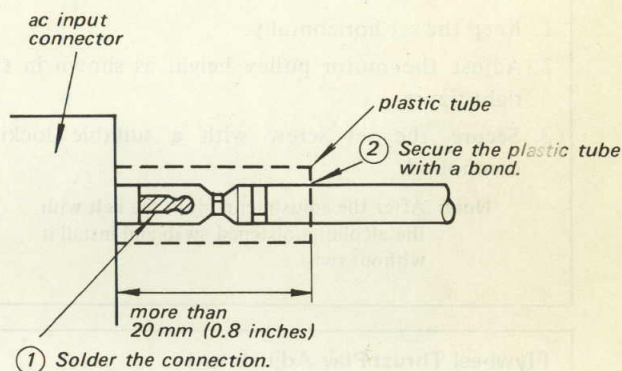
II. Confirmation After Repairing

- Insulation resistance test
Install the batteries in the set and confirm that the insulation resistance tester reads more than 10 MΩ as shown below.



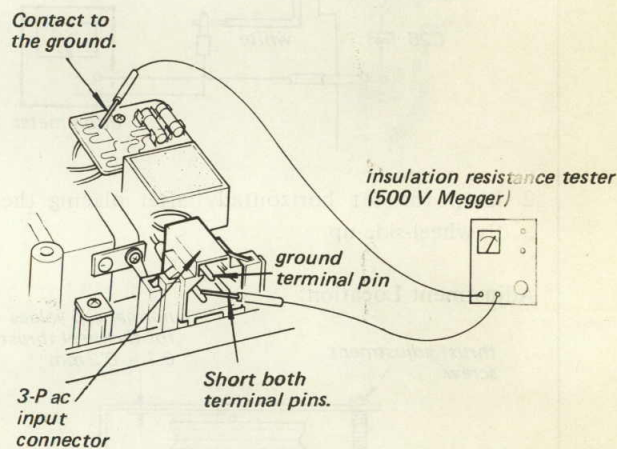
– UK model –

I. AC Input Connector Lead Wire Connection



II. Confirmation After Repairing

- Insulation resistance test
Install the batteries in the set and confirm that the insulation resistance tester reads more than 10 MΩ as shown below.



SECTION 2

ADJUSTMENTS

2-1. MECHANICAL ADJUSTMENTS

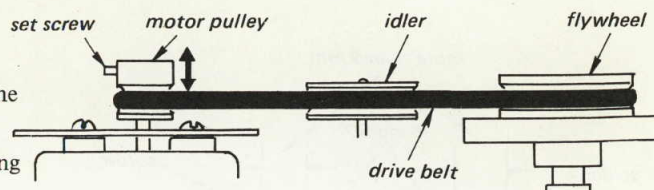
Motor Pulley Height Adjustment

After replacing motor pulley or flywheel, proceed the following adjustment certainly.

Procedure:

1. Keep the set horizontally.
2. Adjust the motor pulley height as shown in the right figure.
3. Secure the set screw with a suitable locking compound.

Note: After the adjustment, clean the belt with the alcohol-moistened swab and install it without twist.

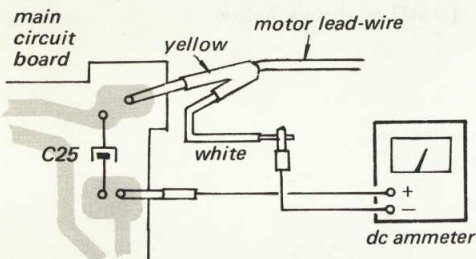


Flywheel Thrust Play Adjustment

— In playback mode —

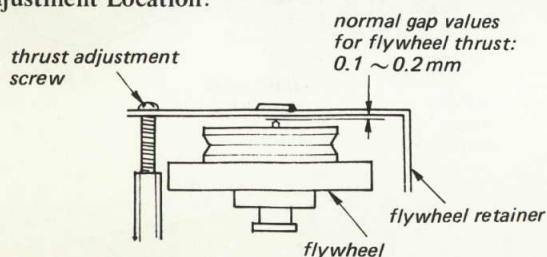
Procedure:

1. Setup

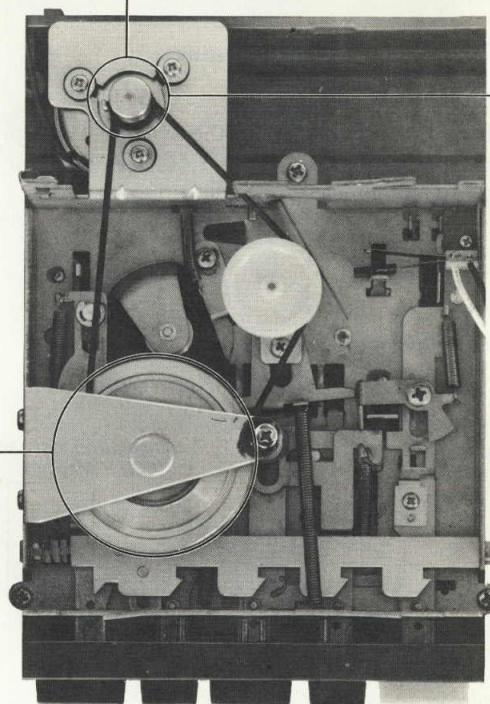


2. Keep the set horizontally after placing the set flywheel-side-up.

Adjustment Location:



3. Loosen the screw until the flywheel retainer is detached from the flywheel.
4. Turn the screw clockwise gradually to the position where the motor current suddenly increases.
5. Then, loosen the screw $\frac{3}{4}$ -turns from the position obtained in step 4.
6. Secure the screw with a suitable locking compound.

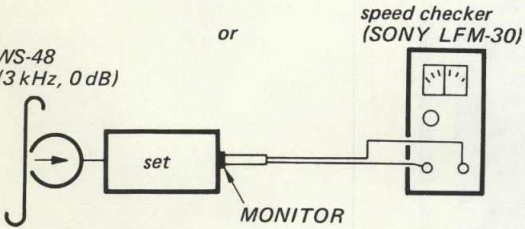
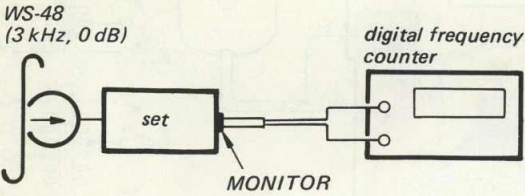


Note: Photograph is E model.

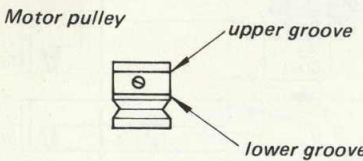
Tape Speed Adjustment

Settings:
Power source: 6 V dc
Procedure:

1. Mode: playback



- Specifications:
- 1)
- | Speed checker | Digital frequency counter |
|---------------|---------------------------|
| $\pm 1\%$ | 2970 Hz – 3030 Hz |
- 2) Frequency difference between beginning and end of tape should be within 1 % (30 Hz).
2. If the above specification is not satisfied, replace motor pulley.



Part No.	Identification	Tape Speed
3-583-534-21	only upper groove	-1.5 % down
3-583-534-11	no groove	standard
3-583-534-01	only lower groove	+1.5 % up

3. After completing the motor pulley replacement, perform the motor pulley height adjustment, on page 10.

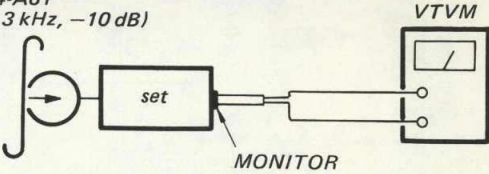
2-2. ELECTRICAL ADJUSTMENTS

Record/Playback Head Azimuth Adjustment

Settings:
TONE control: mechanical mid position
PB VOL control: mechanical mid position
Remove the cassette holder (see page 5).

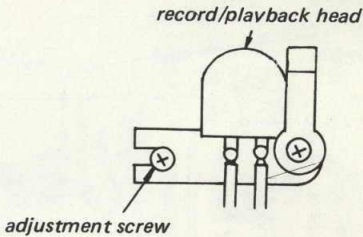
Procedure:

1. Mode: playback
P-4-A81 (6.3 kHz, -10 dB)



2. Turn the adjustment screw for the highest VTVM reading.
- Note: Several peaks may appear, take the highest.
3. Secure the screw with a suitable locking compound.

Adjustment Location:



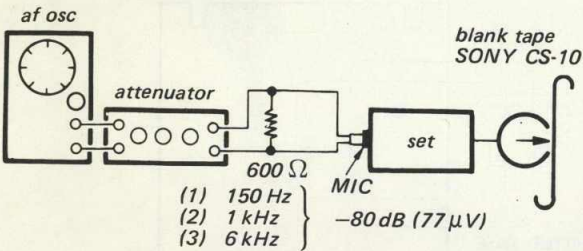
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Record Bias Adjustment

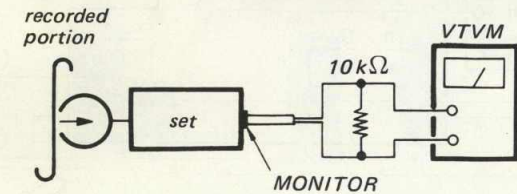
Settings:
TONE control: mechanical mid position

Procedure:

1. Mode: record

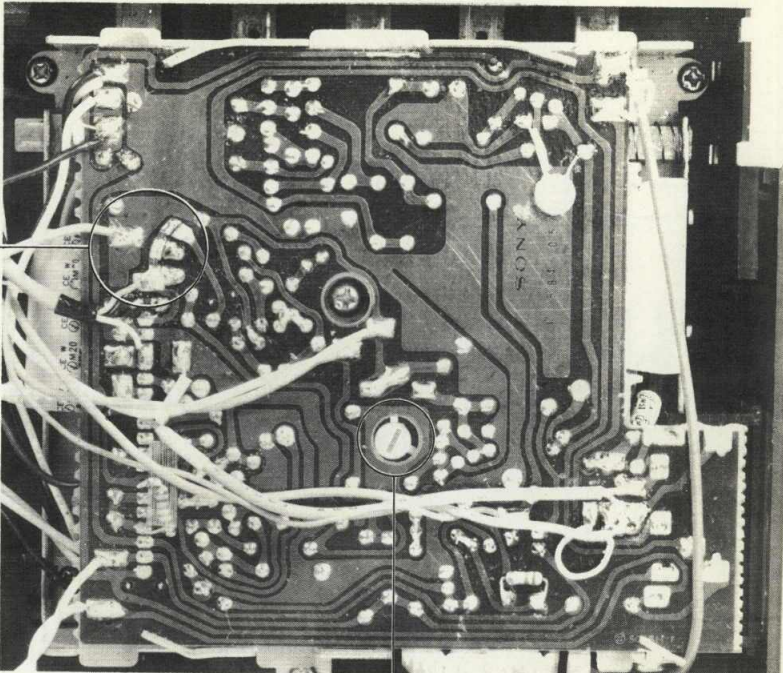
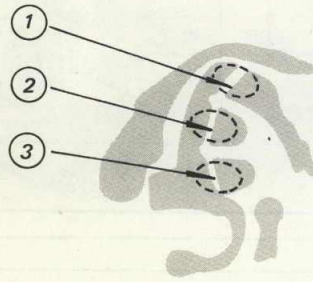


2. Mode: playback



Recorded signal	VTVM reading
1 kHz	Adjust PB VOL control for -10 dB (0.25 V)
150 Hz	6 dB allowable range
6 kHz	150 Hz 1 kHz 6 kHz

If necessary, adjust by changing the pattern connection. 6 kHz response increases in order from ① to ③.



Note: Photograph is E model.

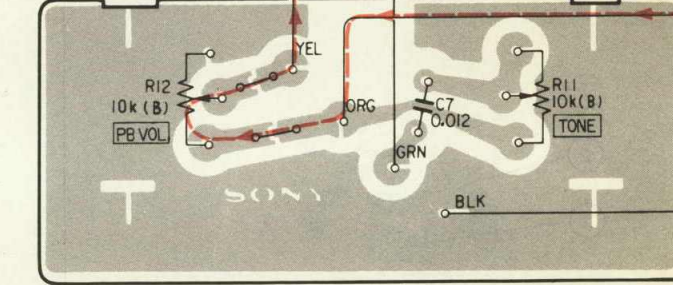
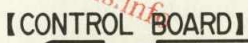
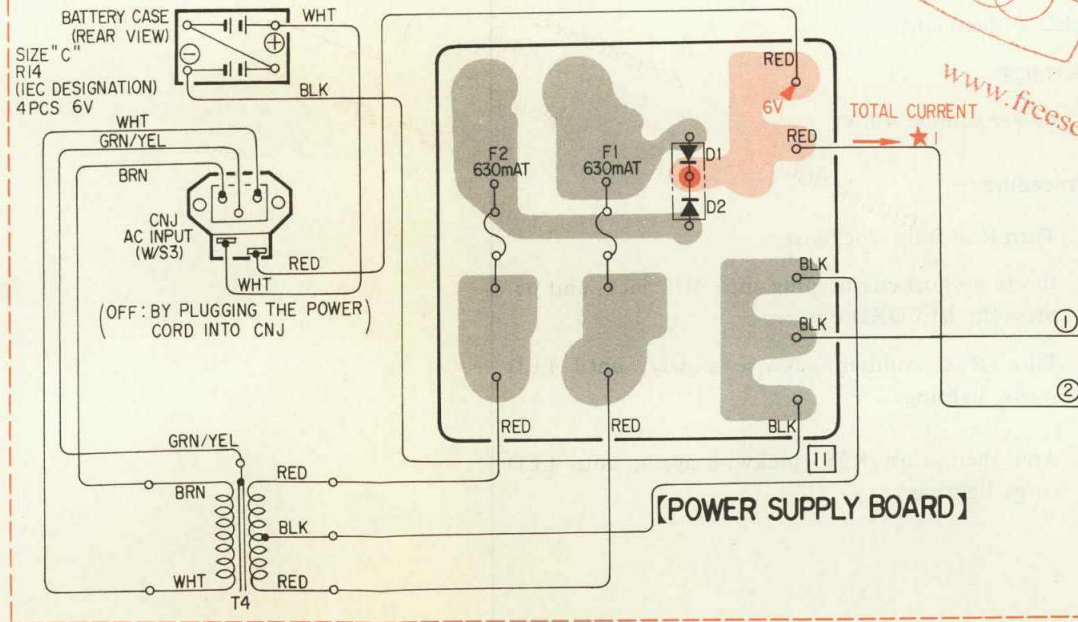
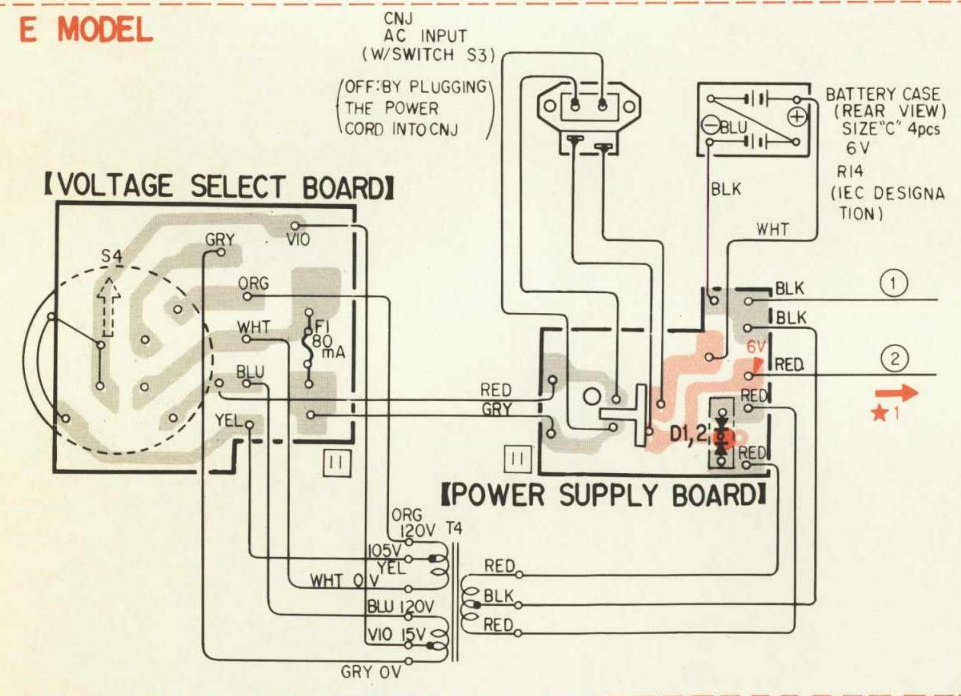
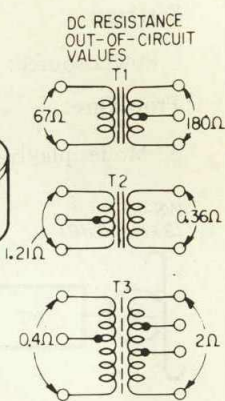
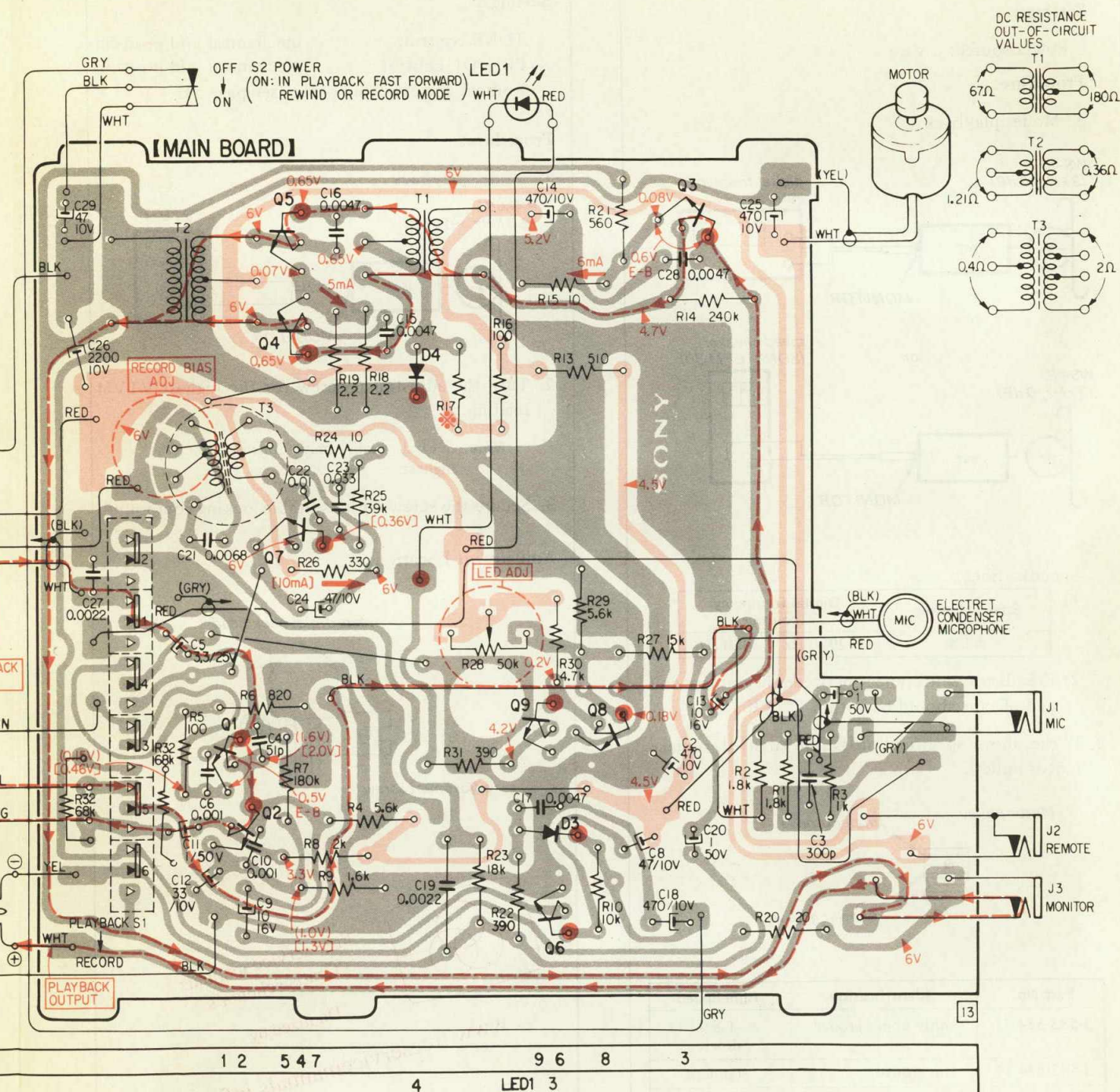
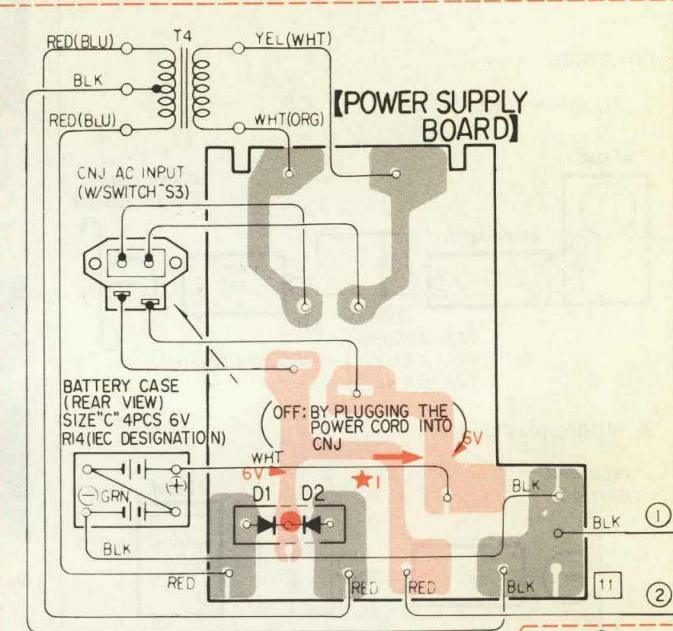
LED Adjustment

Settings:
Power source: 4.6 V

Procedure:

1. Turn R28 fully clockwise.
2. Insert a short-circuit plug into MIC jack, and depress the RECORD button.
3. Turn R28 counterclockwise slowly, until LED starts lighting.
4. And then, turn R28 clockwise again, until LED stops lighting.

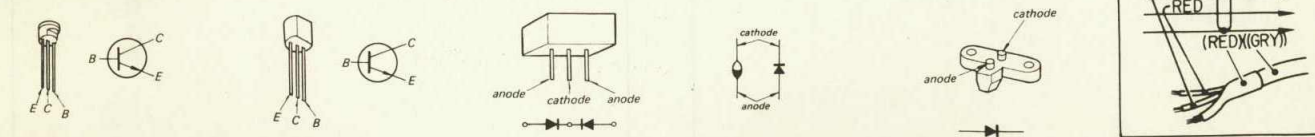
3-1. MOUNTING DIAGRAM — Conductor Side —



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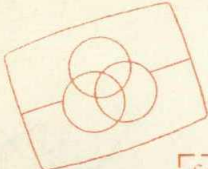
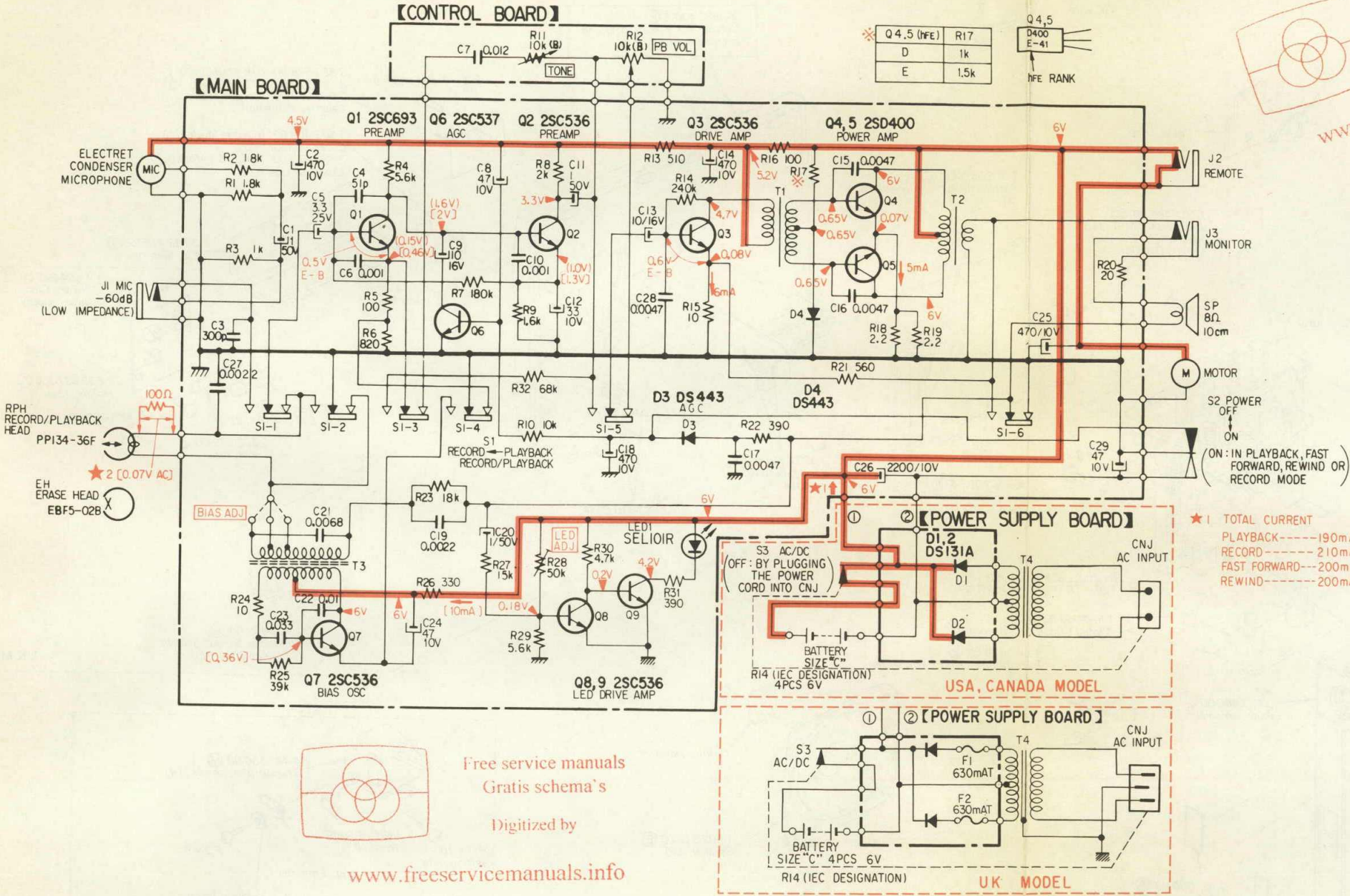
Q1:	2SC693							
Q2, 3, 7 ~ 9:	2SC536							
Q6:	2SC537	Q4, 5:	2SD400	D1, 2:	DS131A	D3, 4	DS443	LED1: SEL101R



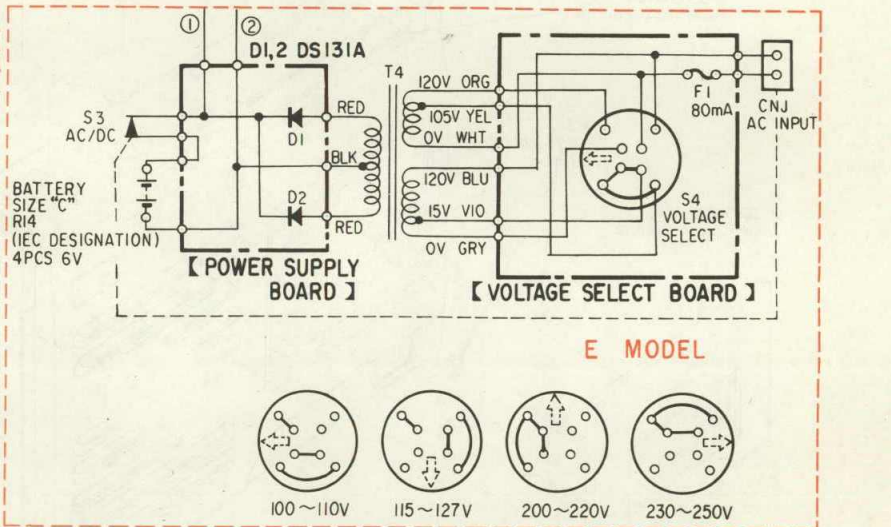
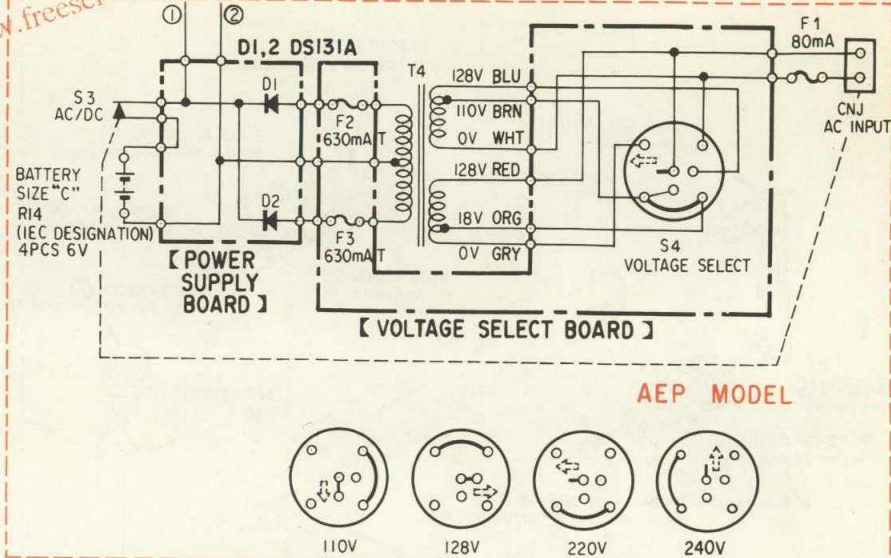
 PLAYBACK SIGNAL PATH
 B+ PATTERN

TC-65 TC-65

3-2. SCHEMATIC DIAGRAM



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Note:

- All capacitors are in μF unless otherwise noted. 50 or less working volts are omitted except for electrolytic type. $p = \mu\text{F}$
- All resistors are in Ω , $\frac{1}{4}W$, unless otherwise noted. $k = 1,000$ $M = 1,000k$
- Coil resistances are out-of-circuit values.
- * indicates values to be selected.
- indicates chassis ground.
- indicates B+ circuit.
- Voltages are DC with respect to ground unless otherwise noted. Readings taken under no-signal conditions with a VOM (20 $k\Omega/V$).
(): PLAYBACK []: RECORD
no mark: common
- Voltage variations may be noted due to normal production tolerances.
- Voltage between base and emitter are measured with 2.5v range.
- Total current is measured with no cassette loaded.

Siwitch Mode:

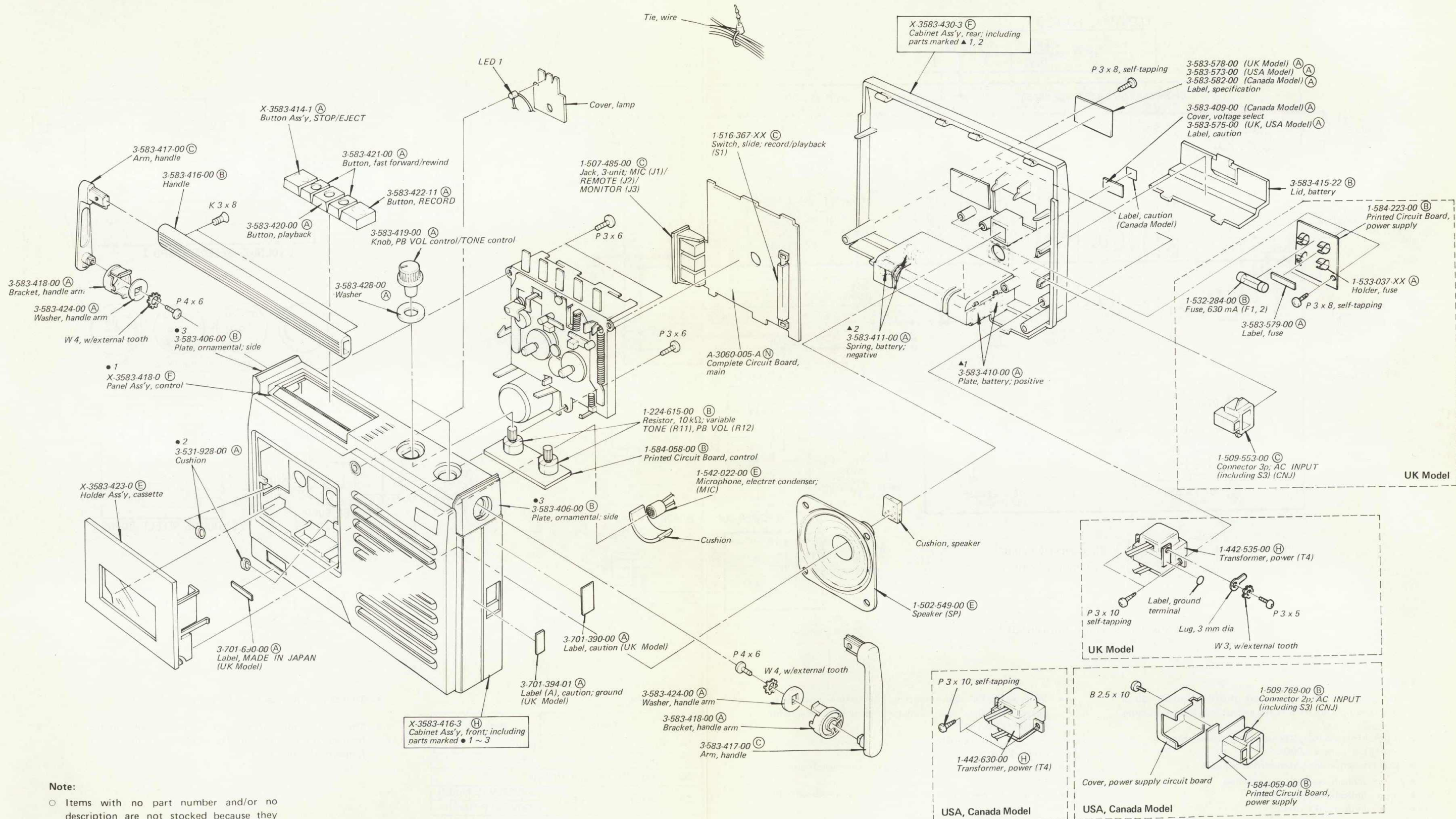
Ref. No.	Switch	Position
S1	record/playback	playback
S2	power	off
S3	ac/dc (Included in CNJ)	dc
S4	VOLTAGE SELECT	200-220V (E Model) 220V (AEP Model)

- T4 includes a thermal fuse. (Canada model only)
- The resistor indicated by *2 is connected only for the head current measurement. The voltage across the resistor is measured with VTVM.

TC-65 TC-65

SECTION 4 EXPLODED VIEWS

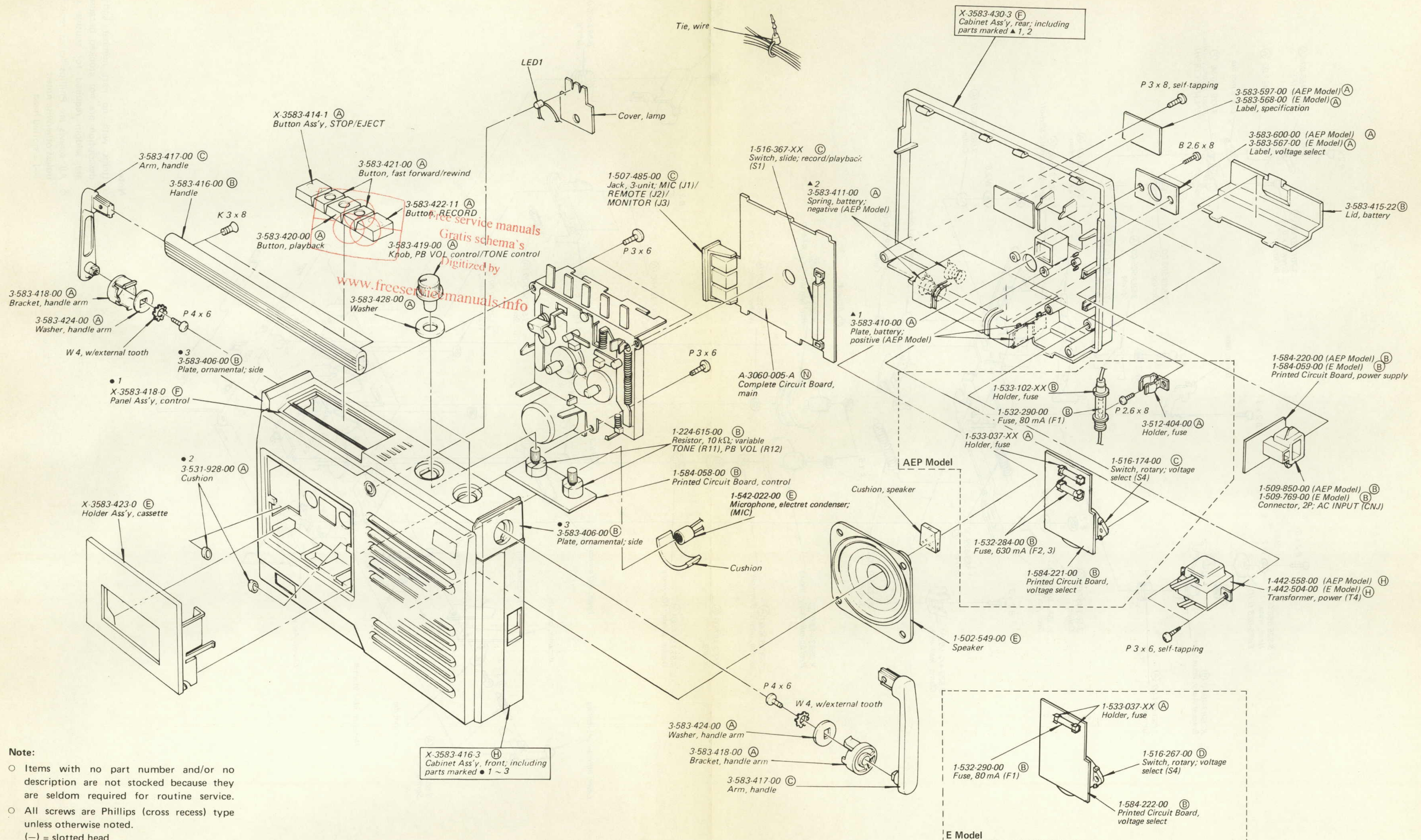
4-1. (UK, USA and Canada model)



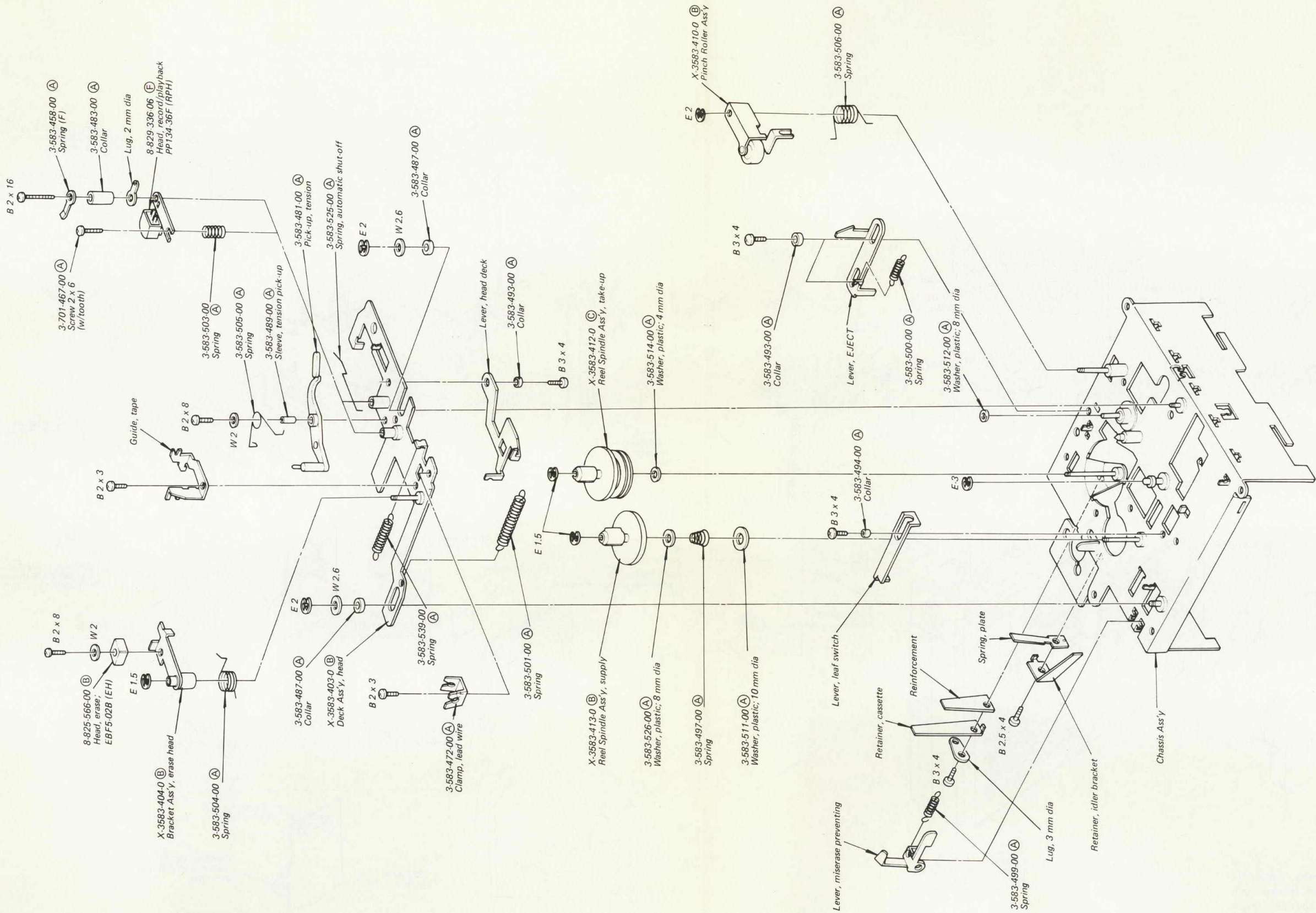
Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head

4-2. (AEP and E model)



4.3.



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head

SECTION 5
PARTS LIST

Ref. No.	Part No.	Description
COMPLETE CIRCUIT BOARD		
A-3060-005-A	(N)	Main
PRINTED CIRCUIT BOARDS		
1-584-058-00	(B)	Control
1-584-059-00	(B)	Power Supply (E, USA, Canada Model)
1-584-220-00	(B)	Power Supply (AEP Model)
1-584-221-00	(B)	Voltage Select (AEP Model)
1-584-222-00	(B)	Voltage Select (E Model)
1-584-223-00	(B)	Power Supply (UK Model)
SEMICONDUCTORS		
Transistors		
Q1	(B)	2SC693 (2SC632A)
Q2, 3	(B)	2SC536 (2SC632A)
Q4, 5	(C)	2SD400 (2SC1384)
Q6	(B)	2SC537
Q7 ~ 9	(B)	2SC536 (2SC632A)
Diodes		
D1, 2	(C)	DS131A (S2RC40)
D3, 4	(B)	DS443 (1S1555)
LED1	(B)	SEL101R
TRANSFORMERS		
T1	1-423-217-00	(B) Input
T2	1-427-397-00	(C) Output
T3	1-405-684-00	(C) Bias Osc
T4	1-442-504-00	(H) Power (E Model)
	1-442-535-00	(H) Power (UK Model)
	1-442-558-00	(H) Power (AEP Model)
	1-442-630-00	(H) Power (USA, Canada Model)

Ref. No.	Part No.	Description
CAPACITORS		
All capacitors are in μF and ceramic type unless otherwise indicated. 50 or less working volts are omitted except for electrolytic type. (elect = electrolytic, p = μpF)		
C1	1-121-391-11	(A) 1 50 V elect
C2	1-121-425-11	(B) 470 10 V elect
C3	1-102 981-11	(A) 300 p
C4	1-101-882-11	(A) 51 p
C5	1-121-392-11	(A) 3.3 25 V elect
C6	1-101 455-11	(A) 0.001
C7	1-105-674-12	(A) 0.012 mylar
C8	1-121-409-11	(A) 47 10 V elect
C9	1-121-471-11	(A) 10 16 V elect
C10	1-101-455-11	(A) 0.001
C11	1-121-391-11	(A) 1 50 V elect
C12	1-121-402-11	(A) 33 10 V elect
C13	1-121-471-11	(A) 10 16 V elect
C14	1-121-425-11	(B) 470 10 V elect
C15 ~ 17	1-102-102-11	(A) 0.0047
C18	1-121-425-11	(B) 470 10 V elect
C19	1-105-665-12	(A) 0.0022 mylar
C20	1-121-391-11	(A) 1 50 V elect
C21	1-105-671-12	(A) 0.0068 mylar
C22	1-105-673-12	(A) 0.01 mylar
C23	1-105-679-12	(A) 0.033 mylar
C24	1-121-352-11	(A) 47 10 V elect
(UK, USA, Canada Model)		
C25	1-121 425-11	(B) 470 10 V elect
C26	1-121-659-11	(B) 2200 10 V elect
C27	1-105-665-12	(A) 0.0022
C28	1-102-102-11	(A) 0.0047
C29	1-121-409-11	(A) 47 10 V elect

Ref. No.	Part No.	Description
RESISTORS		
All resistors are in Ω . $\frac{1}{4}\text{W}$, $\pm 5\%$ composition resistors (except special type) are omitted. Check the schematic diagram for the resistance values. (k = 1,000, M = 1,000 k)		
R11, 12	1-224-615-00	(B) 10 k, variable; TONE/PB
R28	1-224-647-XX	(B) 50 k, adjustable
SWITCHES		
S1	1-516-367-XX	(C) Slide, record/playback
S2	1-516-798-00	(B) Leaf, power
S3		Included in AC INPUT (CNJ), AC/DC
S4	1-516-267-00	(D) Rotary, voltage select (E Model)
	1-516-174-00	(C) Rotary, voltage select (AEP Model)
JACKS		
CNJ	1-509-553-00	(C) Connector, 3P; AC INPUT (including S3) (UK Model)
	1-509-769-00	(B) Connector, 2P; AC INPUT (including S3) (E, USA, Canada Model)
	1-509-850-00	(B) Connector, 2P; AC INPUT (including S3) (AEP Model)

Ref. No.	Part No.	Description
J1 ~ 3	1-507-485-00	(C) 3-unit, MIC (J1)/REMOTE (J2)/MONITOR (J3)
MISCELLANEOUS		
EH	8-825-566-00	(B) Head, erase; EBF5-02B
F1	1-532-290-00	(B) Fuse, 80 mA (E, AEP Model)
F1, 2	1-532-284-00	(B) Fuse, 630 mA (UK Model)
F2, 3	1-532-284-00	(B) Fuse, 630 mA (AEP Model)
M	1-541-816-00	(J) Motor
MIC	1-542-022-00	(E) Microphone, electret condenser
RPH	8-829-336-06	(F) Head, record/playback; PP134-36F
SP	1-502-549-00	(E) Speaker
	1-533-037-XX	(A) Holder, fuse (UK, AEP Model)
	1-533-102-XX	(B) Holder, fuse (AEP Model)

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Part No.	Description	Part No.	Description
1-504-034-12	(C) Earphone; ME-20 (E Model)	3-780-803-11	(C) Manual, instruction (AEP Model)
1-504-055-12	(B) Earphone, (UK, USA, Canada, AEP Model)	3-780-803-21	(A) Manual, instruction (USA, Canada Model)
1-528-002-00	(B) Batteries, size "C" (4) (E Model)	3-780-803-41	(B) Manual, instruction (UK Model)
1-528-026-00	(B) Batteries, size "C" (4) (Canada Model)	3-780-803-51	(C) Manual, instruction (E Model)
1-534-237-23	(E) Cord, connecting; RK-64H	3-793-010-20	(A) Booklet, tape talk
1-534-830-00	(D) Cord, power; DK-33H (E Model)	3-793-408-11	(A) Leaflet
1-534-840-XX	(E) Cord, power; DK-38 (AEP Model)	8-890-216-00	(D) Tape, C-30 (USA Model)
1-534-867-11	(C) Cord, power; DK-35 (USA, Canada Model)	8-893-506-00	(F) Tape, demonstration (E, UK, Canada, AEP Model)
1-534-879-00	(G) Cord, power; DK-44 (UK Model)		
3-701-684-00	(B) Cord, voltage select (E Model)		

(): Replacement Parts.

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Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
 - All screws are Phillips (cross recess) type unless otherwise noted.
- (—) = slotted head