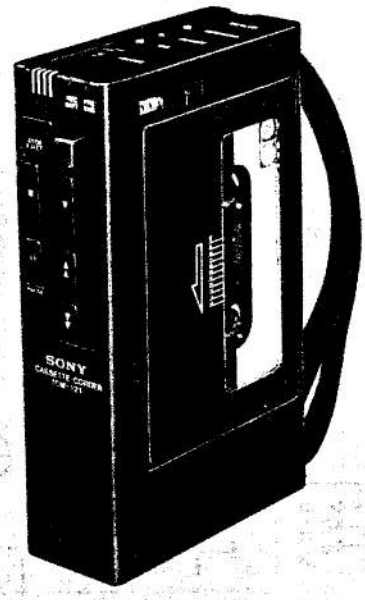
US Model
Canadian Model
AEP Model
E Model
UK Model



CASSETTE-CORDER

SPECIFICATIONS

Power Requirements:

6 V dc, four batteries size "AA" (IEC designation R6) or optional Sony Rechargeable Battery Pack BP-23

120 V ac, 60 Hz with optional Sony AC Power Adaptor AC-9W (US model)

110 or 220 V ac, 50 Hz with optional AC Power Adaptor AC-456C available in European countries (AEP model)

240 V ac, 50 Hz with optional AC Power Adaptor AC-15A available in the United Kingdom (UK model)

120 V ac, 60 Hz with supplied AC Power Adaptor AC-9 (Canadian model)

110, 120, 220 or 240 V ac, 50/60 Hz with optional AC Power Adaptor AC-4A available in other countries (E model)

12 V car battery with optional Sony Car Battery Cord DCC-127A

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ! ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

Power Consumption:

6 W (60 Hz) with Sony AC Power Adaptor AC-9 W
9 VA with Sony AC Power Adaptor AC-456C
6 W (60 Hz) with Sony AC Power Adaptor AC-9
9 W with Sony AC Power Adaptor AC-15A
9.2 W (50 Hz) or 8.9 W (60 Hz) with Sony AC Power Adaptor AC-4A

Recording System: 2-track 1-channel monaural

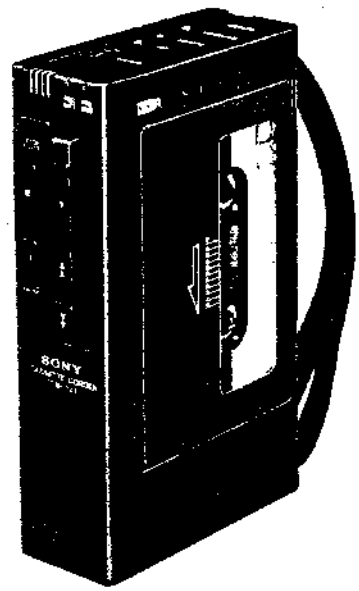
Frequency Response: 90 — 9,000 Hz

Fast Winding Time: Approx. 2 min. with Sony Cassette C-60

	Specifications	Test Equipment
Forward Torque	22.5—60 g · cm (0.31—0.83 oz · inch)	Sony torque meter CQ-101A,102A,103A
Fast Forward Torque	more than 60 g . cm (0.83 oz · inch)	Sony torque meter CQ-201A
Rewind Torque	more than 60 g · cm (0.83 oz · inch)	Sony torque meter CQ-201A
Tape Tension	more than 100 g (3.53 oz)	Sony tape tension meter CQ-403
Pinch Roller Pressure	230—370 g (8.11—13.05 oz)	Spring scale or tension gauge

— Continued on page 2 —

SERVICE MANUAL



SPECIFICATIONS

Power Requirements:

6 V dc, four batteries size "AA" (IEC designation R6) or optional Sony Rechargeable Battery Pack BP-23

120 V ac, 60 Hz with optional Sony AC Power Adaptor AC-9W (US model)

110 or 220 V ac, 50 Hz with optional AC Power Adaptor AC-456C available in European countries (AEP model)

240 V ac, 50 Hz with optional AC Power Adaptor AC-15A available in the United Kingdom (UK model)

120 V ac, 60 Hz with supplied AC Power Adaptor AC-9 (Canadian model)

110, 120, 220 or 240 V ac, 50/60 Hz with optional AC Power Adaptor AC-4A available in other countries (E model)

12 V car battery with optional Sony Car Battery Cord DCC-127A

Power Consumption: 6 W (60 Hz) with Sony AC Power Adaptor AC-9 W
9 VA with Sony AC Power Adaptor AC-456C
6 W (60 Hz) with Sony AC Power Adaptor AC-9
9 W with Sony AC Power Adaptor AC-15A
9.2 W (50 Hz) or 8.9 W (60 Hz)
with Sony AC Power Adaptor AC-4A

Recording System: 2-track 1-channel monaural

Frequency Response: 90 – 9,000 Hz

Fast Winding Time: Approx. 2 min. with Sony Cassette C-60

	Specifications	Test Equipment
Forward Torque	22.5–60 g · cm (0.31–0.83 oz · inch)	Sony torque meter CQ-101A,102A,103A
Fast Forward Torque	more than 60 g . cm (0.83 oz · inch)	Sony torque meter CQ-201A
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Tape Tension	more than 100 g (3.53 oz)	Sony tape tension meter CQ-403
Pinch Roller Pressure	230–370 g (8.11–13.05 oz)	Spring scale or tension gauge

– Continued on page 2 –

SERVICE MANUAL

Power Output: 400 mW (at 10% harmonic distortion) at dc operation

Input: MIC jack (minijack)
sensitivity 0.2 mV (-72 dB)
for low impedance microphone

Output: EARPHONE jack (minijack)
8 Ω earphone or load impedance
10 kΩ or higher

Other Jack: REMOTE control jack

Speaker: Approx. 5 cm (2 inches) dia.

Battery Life: Continuous recording hours with the Built-in Microphone: (Approx.)
2.5 hours with Sony Super Batteries SUM-3S
4 hours with Eveready Heavy Duty Batteries No. 1215

Dimensions: Approx. 39.5 (w) x 154.5 (h) x 92.5 (d) mm
$1^{9}/_{16}$ (w) x $6^{1}/_{8}$ (h) x $3^{11}/_{16}$ (d) inches
not including projecting parts and controls

Weight: Approx. 500 g, 1 lb $1^{3}/_{4}$ oz, including batteries

SECTION 1

OUTLINE

1-1. CIRCUIT DESCRIPTION

Motor Servo Amp Circuit

As the servo amp board is supplied with the motor, replace the motor and the servo amp board at the same time.

The following explanation describes the principle and the operation of the motor servo amp circuit.

By applying load to the motor, the motor rotation generally slows down and the power consumption increases. That is, the impedance of the motor changes in accordance with the rotation of the motor. If this impedance variation is detected and the power voltage is controlled so that the impedance does not change, the rotation can be maintained constant. Fig, 1 shows the principle diagram of the circuit. R1, R2, R3 (impedance of the motor) and R4 compose a bridge circuit. The R3 impedance variation is detected by the voltage variations at points Ⓐ and Ⓑ . Q2 compares the voltages at points Ⓐ and Ⓑ , and controls the speed of the motor.

The operation is as follows.

- When the rotation of the motor slows down:

  ↓

  Impedance (R3); LOW impedance.

  ↓

  Q2, base; current decreases.

  ↓

  Q2, collector; current decreases.

  ↓

  Q1, base and emitter; current increases.

  ↓

  Point Ⓒ ; HIGH voltage.

  ↓

  Restrains the motor from slowing down.

- When the rotation of the motor speeds up:

  ↓

  Point Ⓒ ; LOW voltage.

  ↓

  Restrains the motor from speeding up.

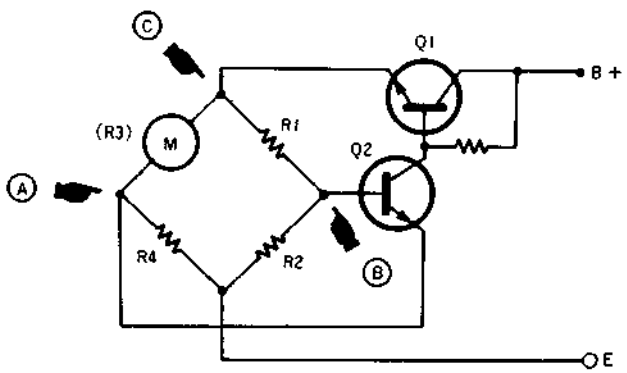
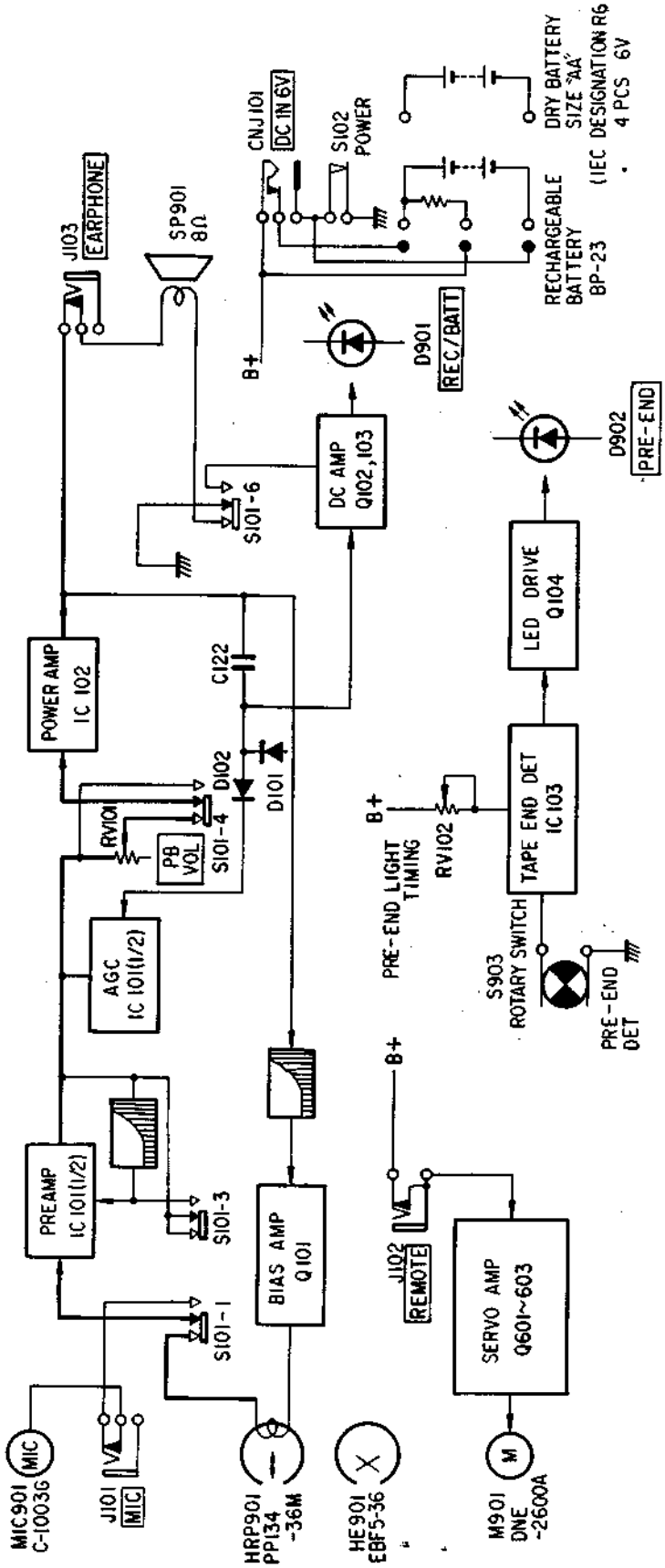


Fig 1.

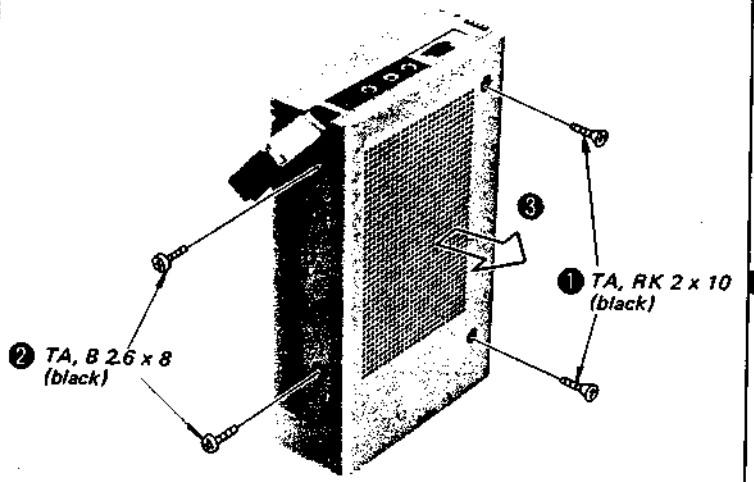
1-2. BLOCK DIAGRAM



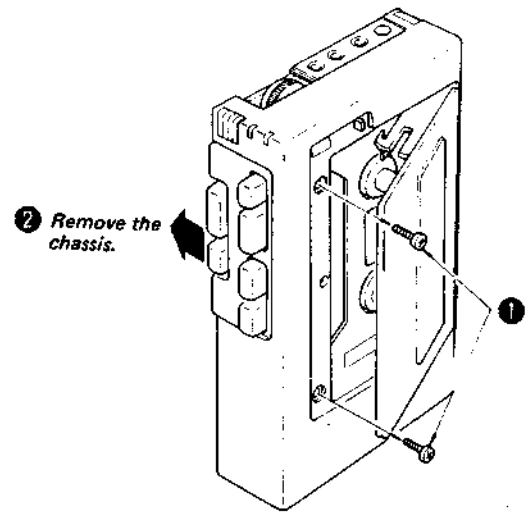
SECTION 2
DISASSEMBLY

- Follow the disassembly procedure in the numerical order given.

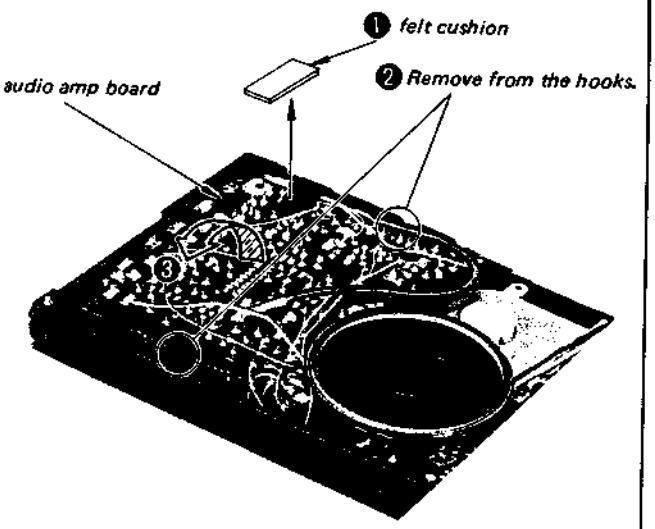
Bottom Case



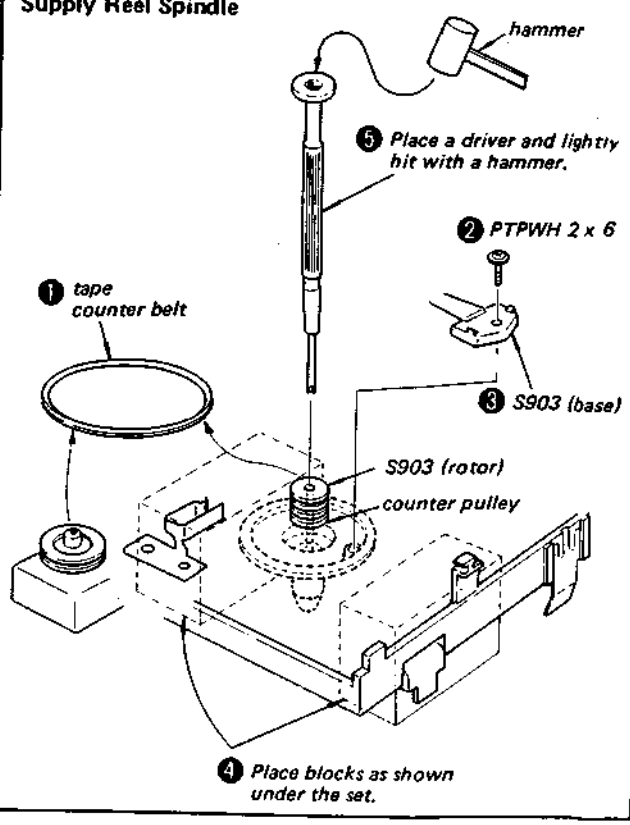
Chassis



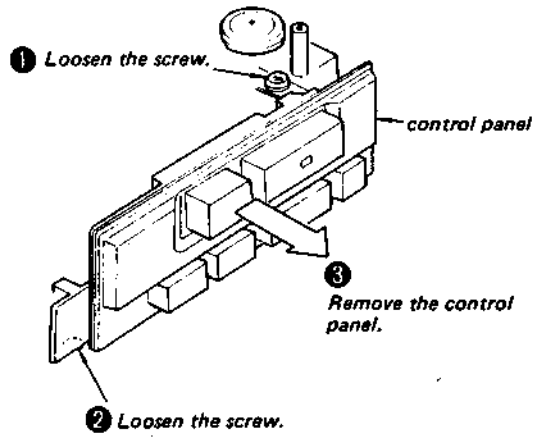
Audio Amp Board



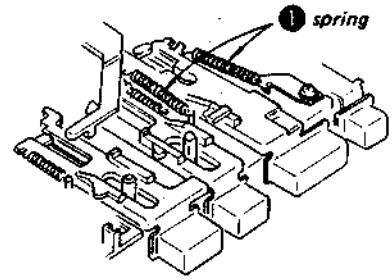
Supply Reel Spindle

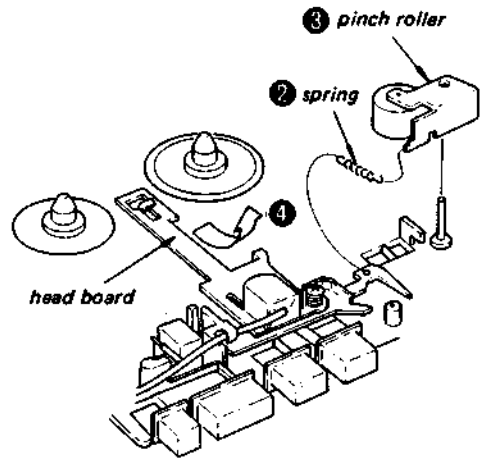


Control Panel



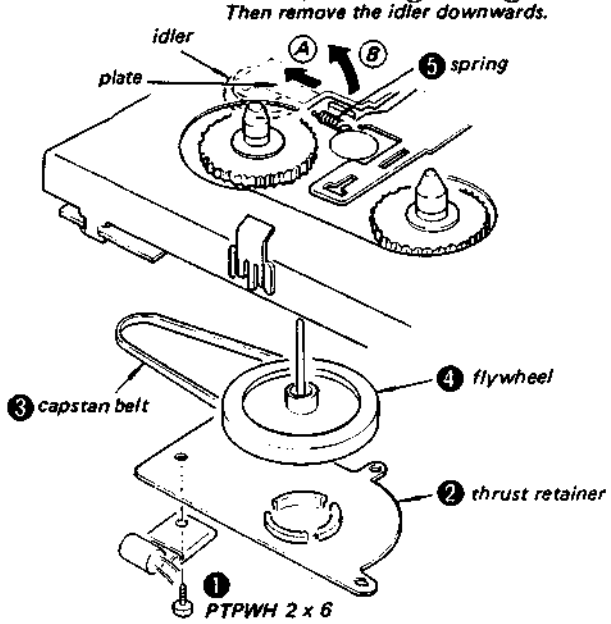
Head Board



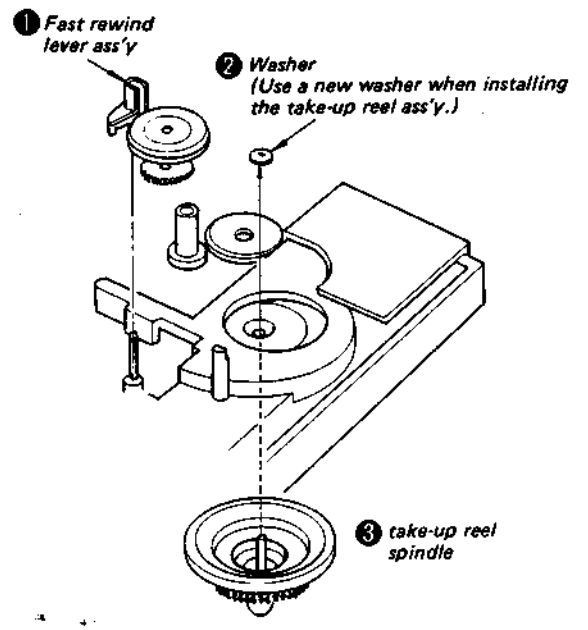


Remove the flywheel.
Refer to the "Idler" removal.

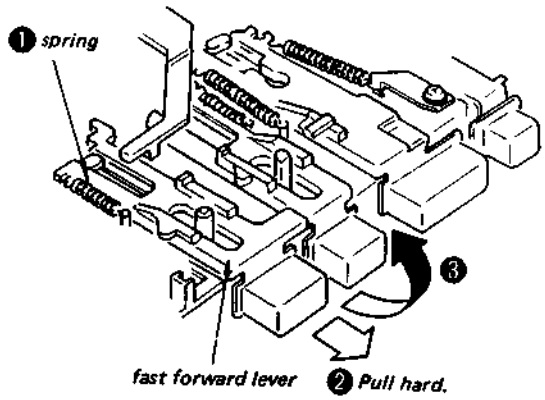
Move the plate in the direction shown by arrows Ⓐ and Ⓑ. Then remove the idler downwards.



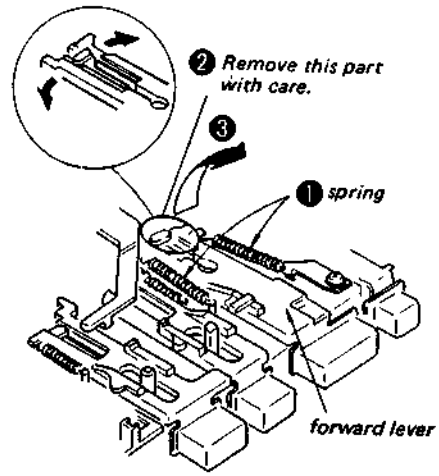
Take-up Reel Spindle



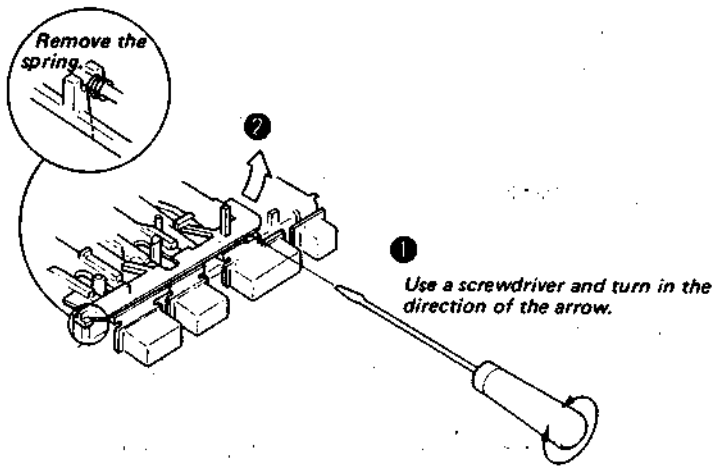
Fast Forward Lever



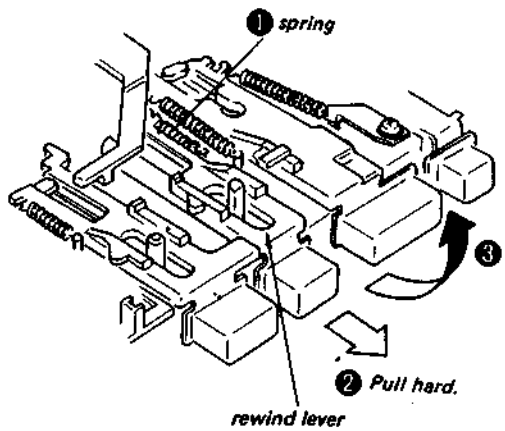
Forward Lever



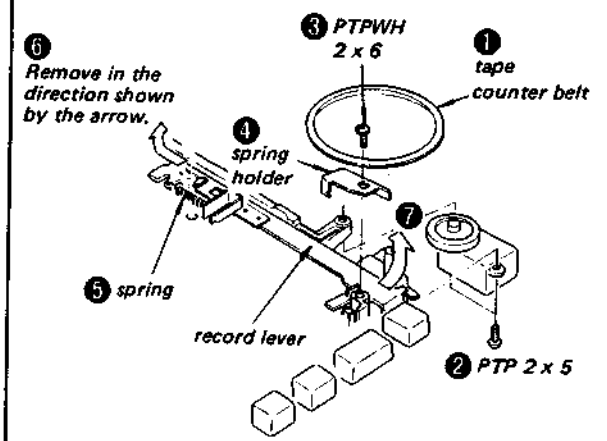
Lock Plate



Rewind Lever



Record Lever



SECTION 3

ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

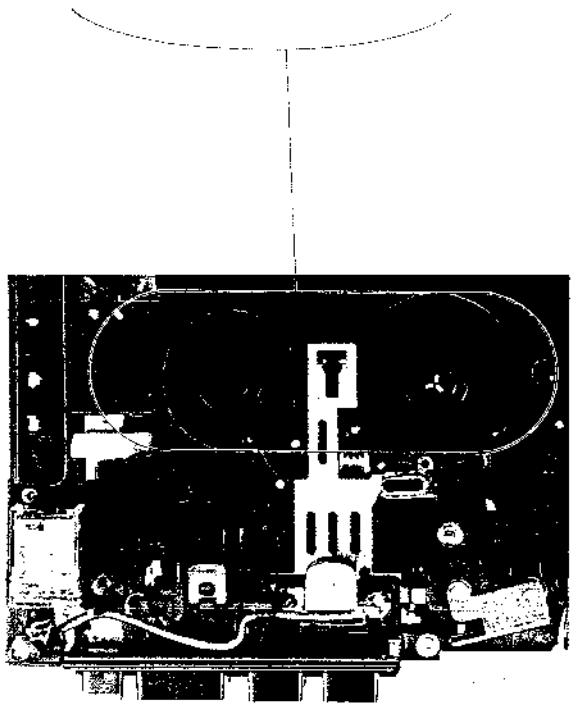
Torque Measurement

Torque	Torque meter	Meter reading	
Forward	CQ-101A, 102A, 103A	22.5–60 g · cm (0.31–0.83 oz · inch)	*1
Fast Forward and Rewind	CQ-201A	more than 60 g · cm (0.83 oz · inch)	*2

Tape Tension Measurement

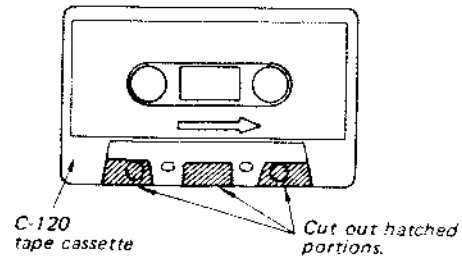
Meter	Meter reading
CQ-403	more than 100 g (3.53 oz)

*1: If necessary, replace the idler.
*2: If necessary, replace the fast forward/rewind lever assembly.

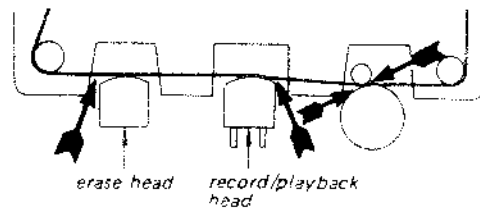


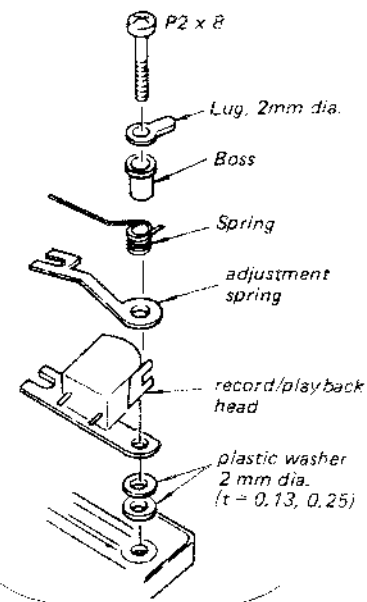
Head Height Adjustment

1. Prepare an adjustment cassette as shown below.

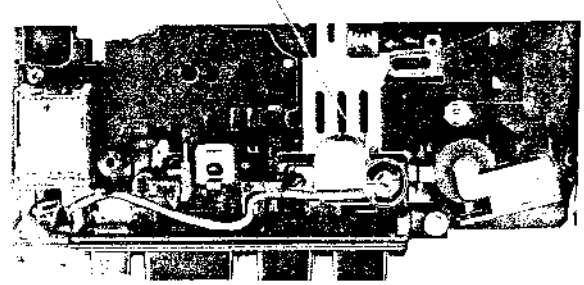


2. In playback mode and viewing from the front, adjust the head heights to eliminate tape curl and tape twist at arrowed portions.





Adjustment Location:

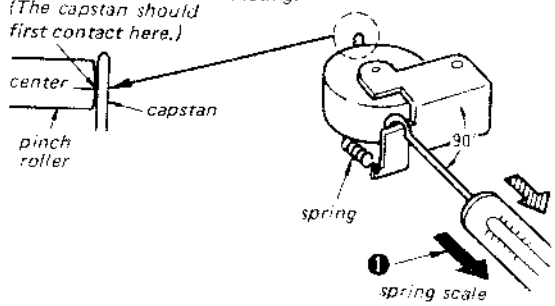


3-2. ELECTRICAL ADJUSTMENTS

Pinch Roller Pressure Adjustment

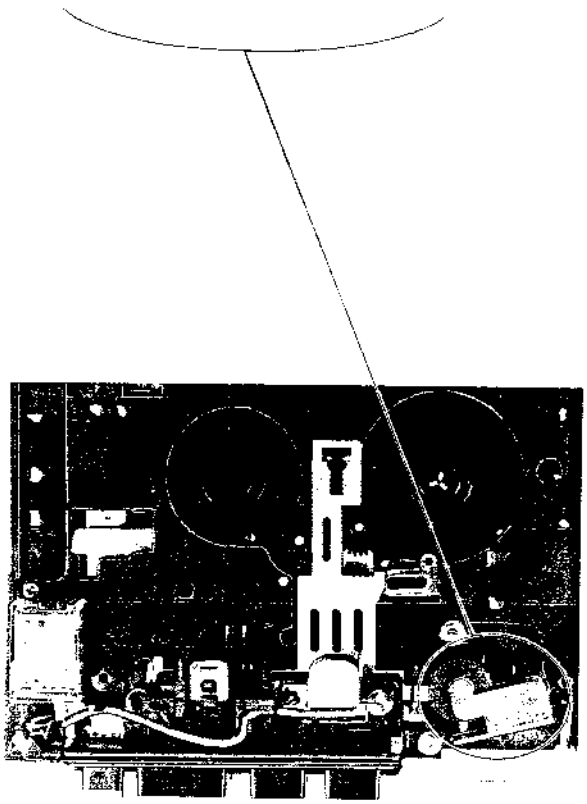
— Playback Mode —

❷ *Slowly return the pinch roller and read the spring scale just when the pinch roller starts rotating. (The capstan should first contact here.)*



230–370 g (8.11–13.05 oz)

If necessary, replace the spring.



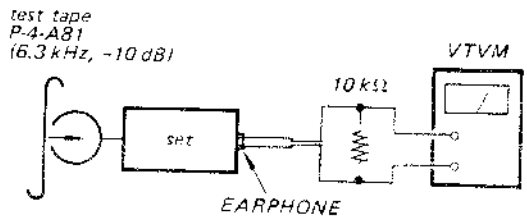
Record/playback Head Azimuth Adjustment

Setting:

PB VOL Control: mechanical mid

Procedure:

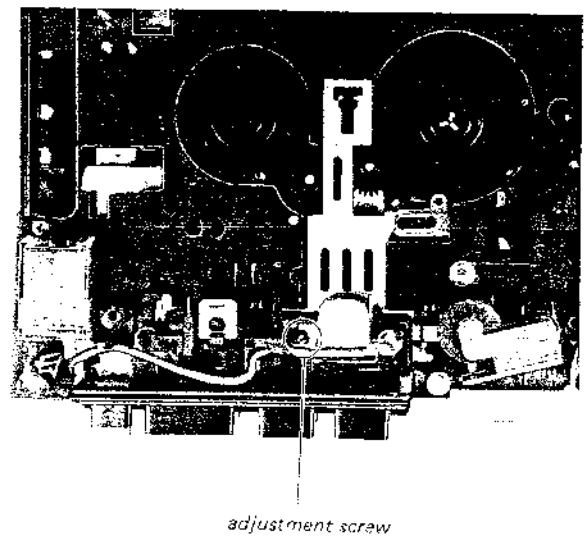
1. Mode: playback



2. Turn the adjustment screw for maximum VTVM reading.

Note: Several peaks may appear, but take the maximum.

Adjustment Location.



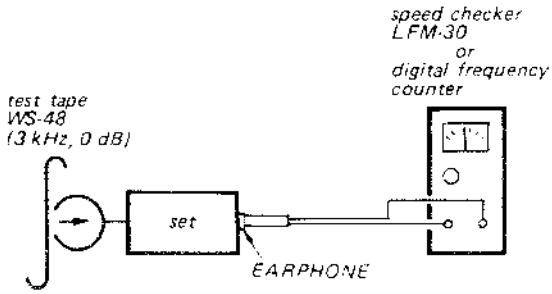
Tape Speed Adjustment

Setting:

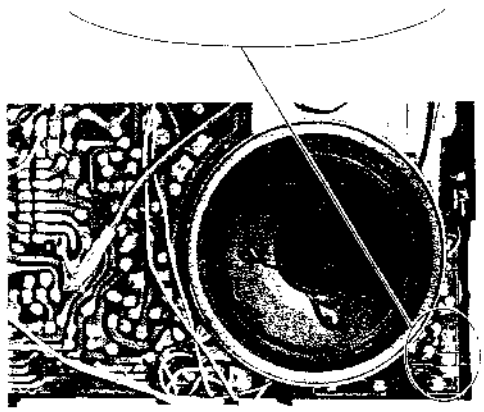
PB VOL Control: mechanical mid

Procedure:

Mode: playback



Adjust RV601 so that the speed checker or the digital frequency counter reads 0 % or 3 kHz.



Pre-end Light Timing Adjustment

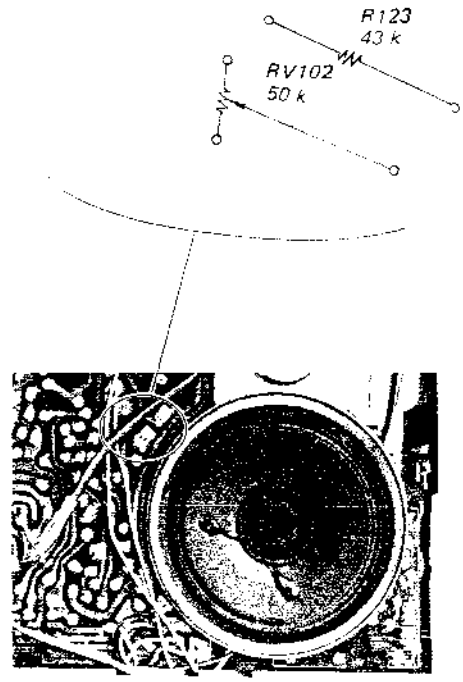
Apply 5.0 V dc power.

Procedure:

1. Playback the tape (C-60) from the beginning and stop it after 3 minutes.
2. Playback the other side of the cassette tape. Adjust RV102 so that D902 (PRE-END) starts lighting after 10 seconds.
3. If necessary, change the value of R123 and perform the adjustment again.

Value	Detection
big	faster
small	slower

Confirm that there is no tape curl or tape twist.

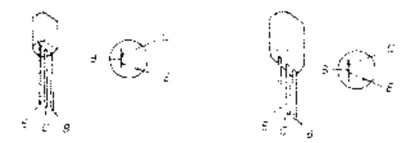


SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM

- Replacement Semiconductors

Q101 ~ 104: 2SC1364 (2SC633A)



IC101: LA3210 IC102: LA4140

IC103: μPD 4011

D101, 102: 1S1555 (1T40)

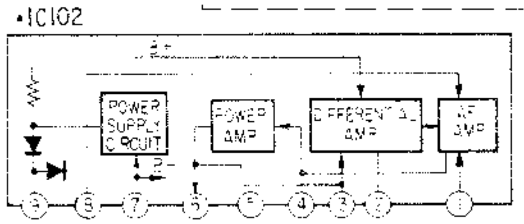
D901, 902: SLP24B

Note

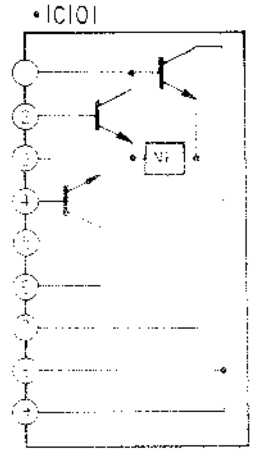
- ---: parts extracted from the component side.
- •—: parts extracted from the conductor side.
- ■: part mounted on the conductor side.

THE MOTOR AND THE SERVO AMP SECTION ARE SUPPLIED TOGETHER. (ONLY RV601 IS REPLACEABLE.)

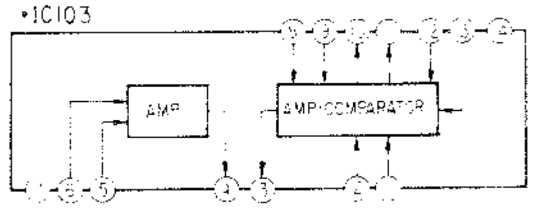
• IC102

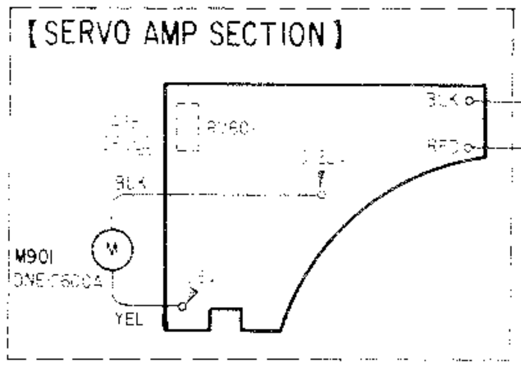


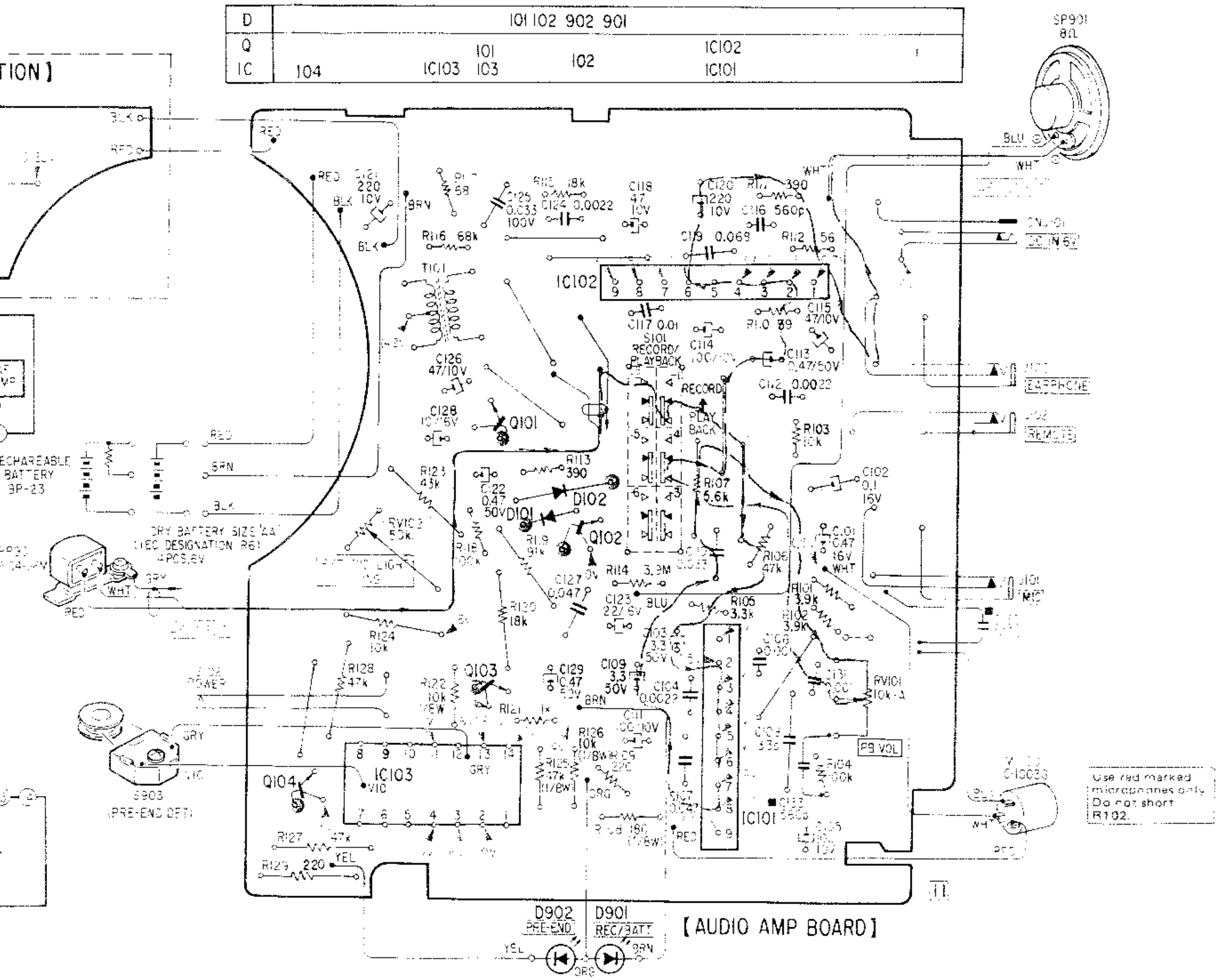
• IC101



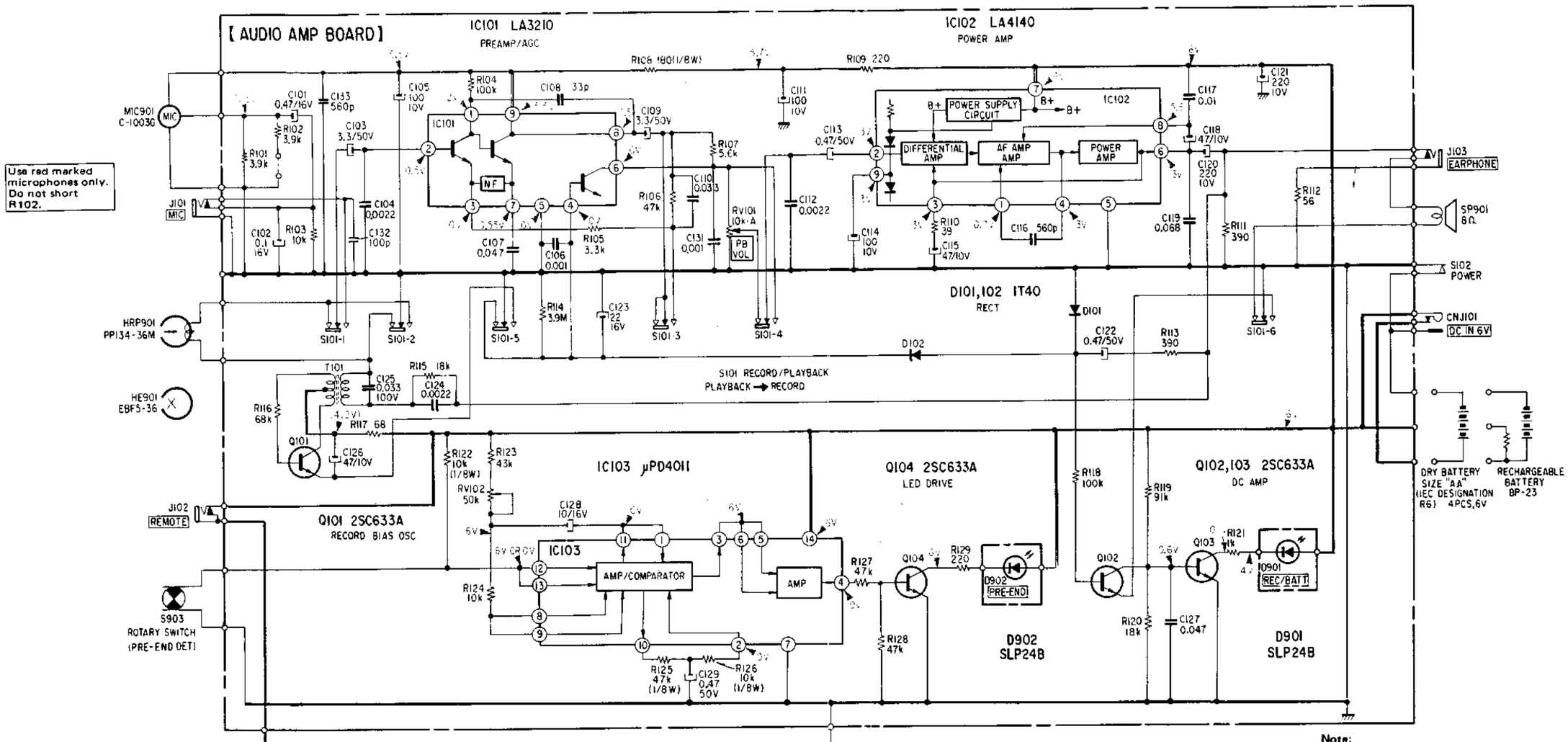
• IC103







4-2. SCHEMATIC DIAGRAM



Note:

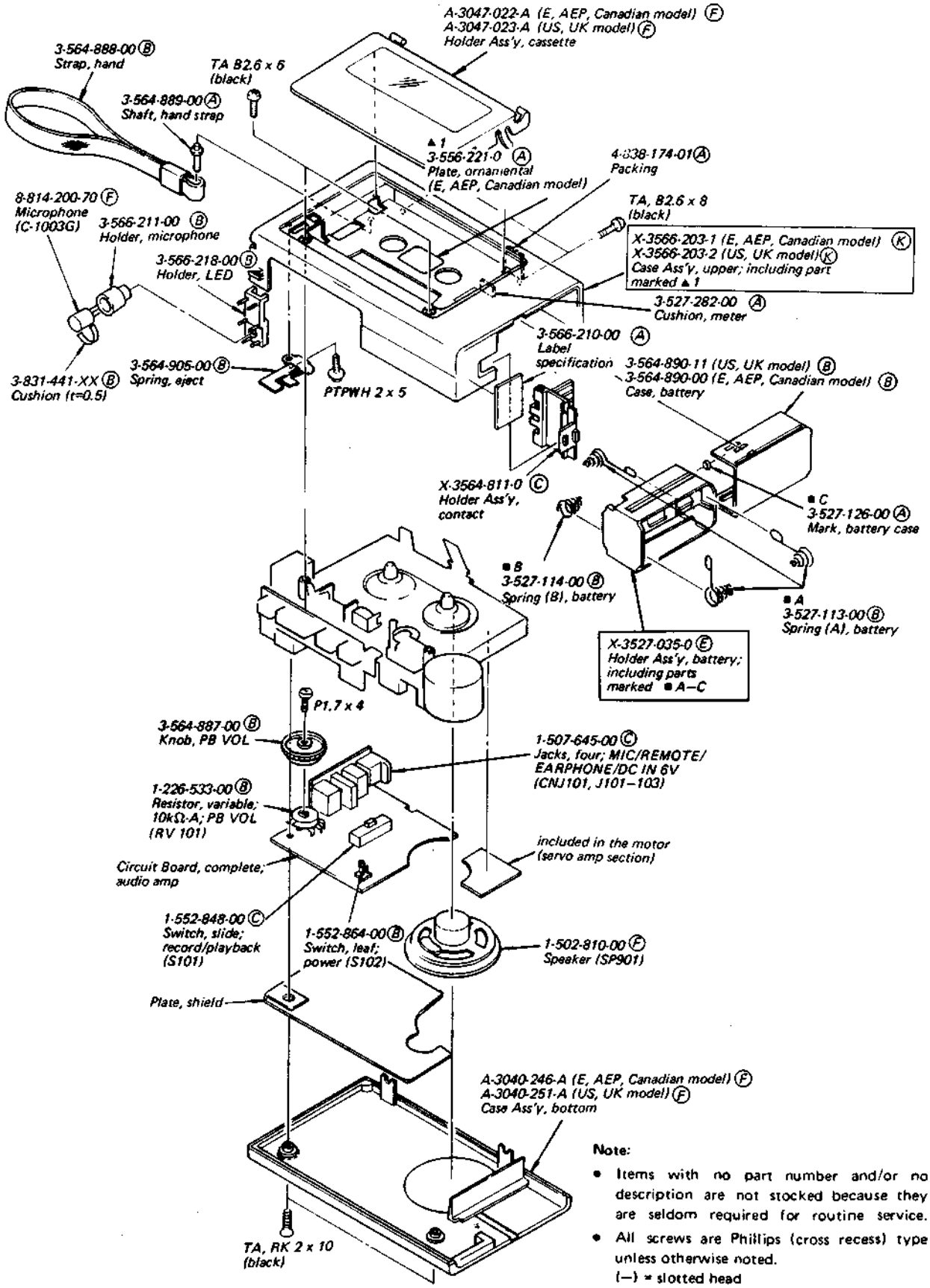
- All capacitors are in μF unless otherwise noted. pF : μμF 50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms, ¼ W unless otherwise noted. kΩ : 1000 Ω; MΩ : 1000 kΩ
- ——— : B+ bus.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- Readings are taken under no-signal conditions with a VOM (10 kΩ/V).
  ( ) : record mode
- Switch

Ref. No.	Switch	Position
S101	RECORD/PLAYBACK	PLAYBACK
S102	POWER	OFF
S903	PRE-END DET	OFF

SECTION 5

EXPLODED VIEWS

5-1.



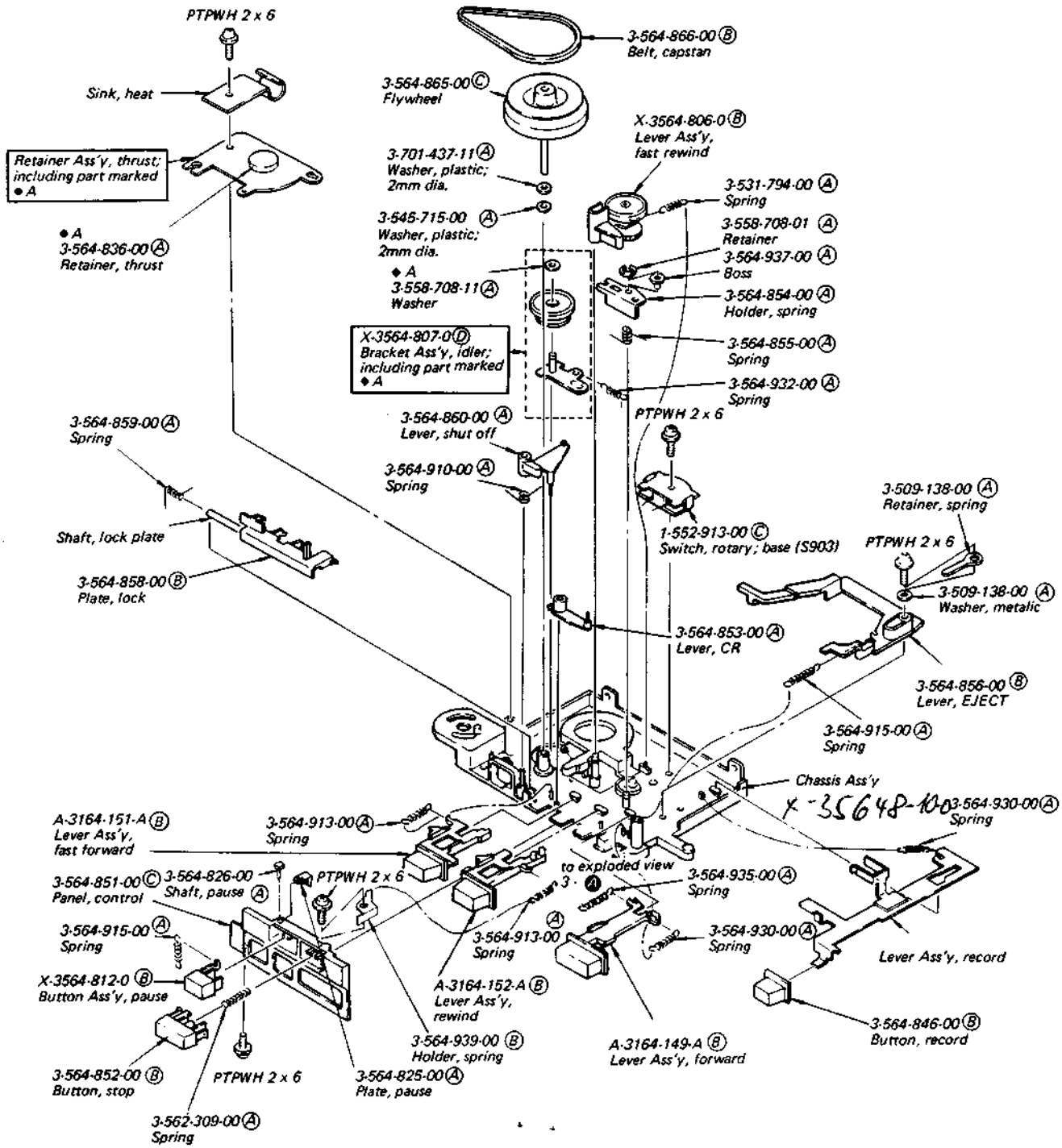
Note:

- 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
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

5-2.

Note:

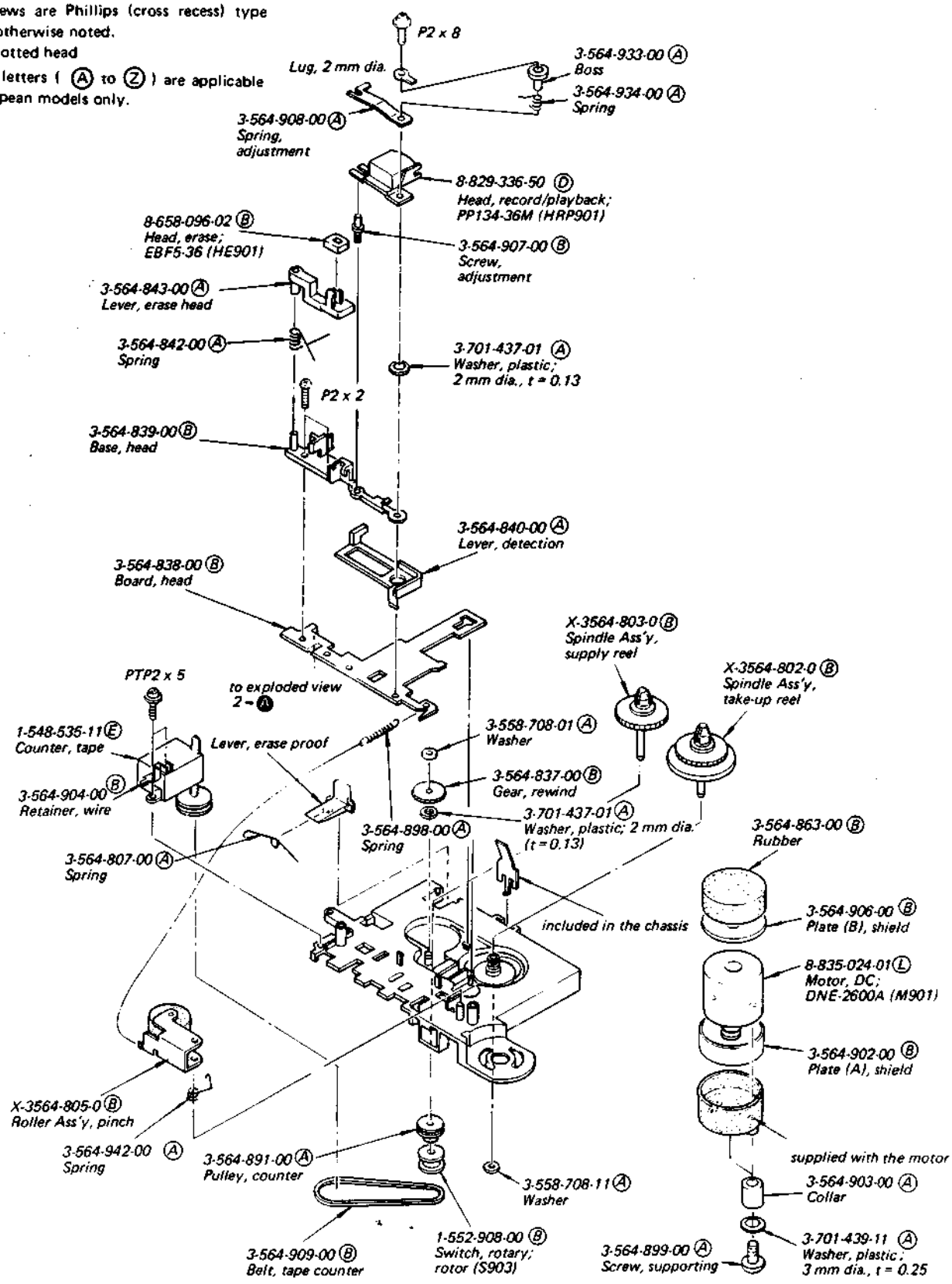
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (−) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.



5-3.

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
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.



SECTION 6

ELECTRICAL PARTS LIST

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.	Description
		SEMICONDUCTORS
		Transistor
⇒Q101–104	8-729-663-47 Ⓒ	2SC1364
		ICs
IC101	8-759-832-10 Ⓒ	LA3210
IC102	8-759-841-40 Ⓒ	LA4140
IC103	8-759-240-11 Ⓑ	μPD4011
		Diodes
⇒D101, 102	8-719-815-55 Ⓑ	1S1555
D901, 902	8-719-900-24 Ⓒ	SLP24B
		CAPACITORS

All capacitors are in μF and ceramic unless otherwise noted. 50WV or less are not indicated except for electrolytics.
P: μμF, elect: electrolytic

C101	1-131-455-00 Ⓑ	0.47		tantalum
C102	1-161-021-00 Ⓑ	0.047		(semiconductor)
C103	1-123-354-00 Ⓑ	3.3	50V	elect
C104	1-101-002-00 Ⓐ	0.0022		
C105	1-123-307-00 Ⓐ	100	10V	elect
C106	1-101-001-00 Ⓐ	0.001		
C107	1-161-021-00 Ⓐ	0.047		(semiconductor)
C108	1-102-963-00 Ⓐ	33p		
C109	1-123-354-00 Ⓑ	3.3	50V	elect
C110	1-161-019-00 Ⓐ	0.033		(semiconductor)
C111	1-123-307-00 Ⓐ	100	10V	elect
C112	1-101-002-00 Ⓐ	0.0022		
C113	1-123-351-00 Ⓑ	0.47	50V	elect
C114	1-123-307-00 Ⓐ	100	10V	elect
C115	1-123-306-00 Ⓑ	47	10V	elect
C116	1-102-115-00 Ⓐ	560p		
C117	1-161-032-00 Ⓐ	0.01		(semiconductor)
C118	1-123-306-00 Ⓑ	47	10V	elect
C119	1-161-061-00 Ⓐ	0.068		(semiconductor)
C120	1-123-308-00 Ⓐ	220	10V	elect
C121	1-123-308-00 Ⓐ	220	10V	elect
C122	1-123-351-00 Ⓑ	0.47	50V	elect
C123	1-123-317-00 Ⓑ	22	16V	elect
C124	1-161-028-00 Ⓐ	0.0022		(semiconductor)
C125	1-108-383-00 Ⓐ	0.033		mylar
C126	1-123-306-00 Ⓑ	47	10V	elect
C127	1-161-021-00 Ⓑ	0.047		(semiconductor)
C128	1-123-316-00 Ⓑ	10	16V	elect
C129	1-123-351-00 Ⓑ	0.47	50V	elect
C130	1-123-306-00 Ⓑ	47		elect
C131	1-102-106-00 Ⓐ	100p		
C132	1-102-106-00 Ⓐ	100p		
C133	1-102-115-00 Ⓐ	560p		

RESISTORS

All resistors are in ohms. Common ¼W carbon resistors are omitted. Refer to the list on the last page for their part numbers.

R108	1-210-360-00 Ⓐ	180	⅛ W	carbon
R122	1-209-781-00 Ⓐ	10 k	⅛ W	carbon
R125	1-210-384-00 Ⓐ	47	⅛ W	carbon
R126	1-209-781-00 Ⓐ	10 k	⅛ W	carbon
RV101	1-226-533-00 Ⓑ	Resistor, variable ; 10 k-A (PB VOL)		
RV102	1-226-238-00 Ⓐ	Resistor, adjustable; 50 k-B		
RV601	1-224-728-00 Ⓓ	Resistor, adjustable; 1 k-B		

Switches

S101	1-552-848-00 Ⓒ	Slide; record/playback	
S102	1-552-864-00 Ⓑ	Leaf, power	
S903	1-552-913-00 Ⓒ	Rotary (base)	pre-end det
	1-552-908-00 Ⓑ	Rotary (rotor)	

Jacks

CNJ101 J101–103	1-507-645-00 Ⓒ	DC IN 6V MIC/REMOTE/EARPHONE

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	*Part No.*	*Description*
		MISCELLANEOUS
HE901	8-658-096-02 Ⓑ	Head, erase; EBF5-36
HRP901	8-829-336-50 Ⓓ	Head, record/playback; PP134-36M
M901	8-835-024-01 Ⓛ	Motor; DNE-2600A (including the servo amp section)
MIC901	8-814-200-70 Ⓕ	Microphone, C-1003G
SP901	1-502-810-00 Ⓕ	Speaker 8 Ω
T101	1-433-105-11 Ⓑ	Transformer, BIAS OSC

ACCESSORIES AND PACKING MATERIALS

Part No.		*Description*
⚠1-463-806-00	Ⓚ	Adaptor, AC; AC-9 (Canadian model)
1-504-075-00	Ⓒ	Earphone, magnetic
1-506-309-00	Ⓑ	Plug, short; SP-100 (UK, E, AEP, Canadian model)
1-528-027-11		Battery, dry; SUM-3 (US, E model)
1-534-542-XX	Ⓒ	Cord, DC plug
3-566-215-00	Ⓒ	Carton (UK, AEP, E model)
3-566-217-00	Ⓕ	Case, carrying
3-566-219-00		Carton (Canadian model)
3-566-220-00		Carton (US model)
3-564-922-00	Ⓐ	Spacer
3-564-925-00	Ⓑ	Cushion
3-564-948-00	Ⓑ	Plate, reinforcement (US, UK, E, Canadian model)
3-701-624-00	Ⓐ	Bag, plastic
3-770-818-11	Ⓒ	Manual, instruction (Canadian, UK, AEP model)
3-770-818-21		Manual, instruction (US model)
3-770-818-51		Manual, instruction (E model)
3-793-828-11	Ⓐ	Card, caution
3-794-233-21		Leaflet (US model)
8-890-205-00	Ⓓ	Tape, demonstration; C-30 (UK, E, AEP, Canadian model)

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

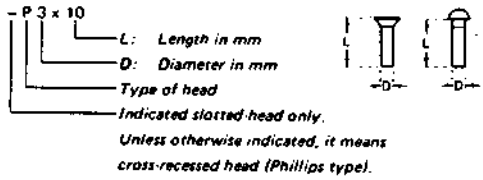
1/4 WATT CARBON RESISTORS Ⓐ

Note: Circled letter Ⓐ is applicable to European models only.

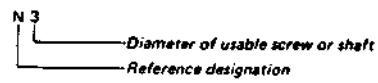
Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-576-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-577-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-578-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-579-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-580-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-581-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-582-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-583-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-584-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-585-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-586-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-587-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-588-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-589-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

HARDWARE NOMENCLATURE

Screw:



Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		brazier-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH	Ⓐ	pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

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