

WM-AF50

SERVICE MANUAL

*US Model
Canadian Model*



Model Name Using Similar Mechanism	New Mechanism
Tape Transport Mechanism Type	MT-WMA26-19

SPECIFICATIONS

Radio FM: 87.6—108 MHz
AM: 530—1,710 kHz

Power requirements 3 V DC Batteries R6 (AA) × 2
BP-700 rechargeable battery
External DC 3 V power sources

Battery life
(Approximate hours)

	Playback	FM
Sony Alkaline AM3 (N)	8 hrs.	30 hrs.
Rechargeable BP-700	2 hrs.	6 hrs.

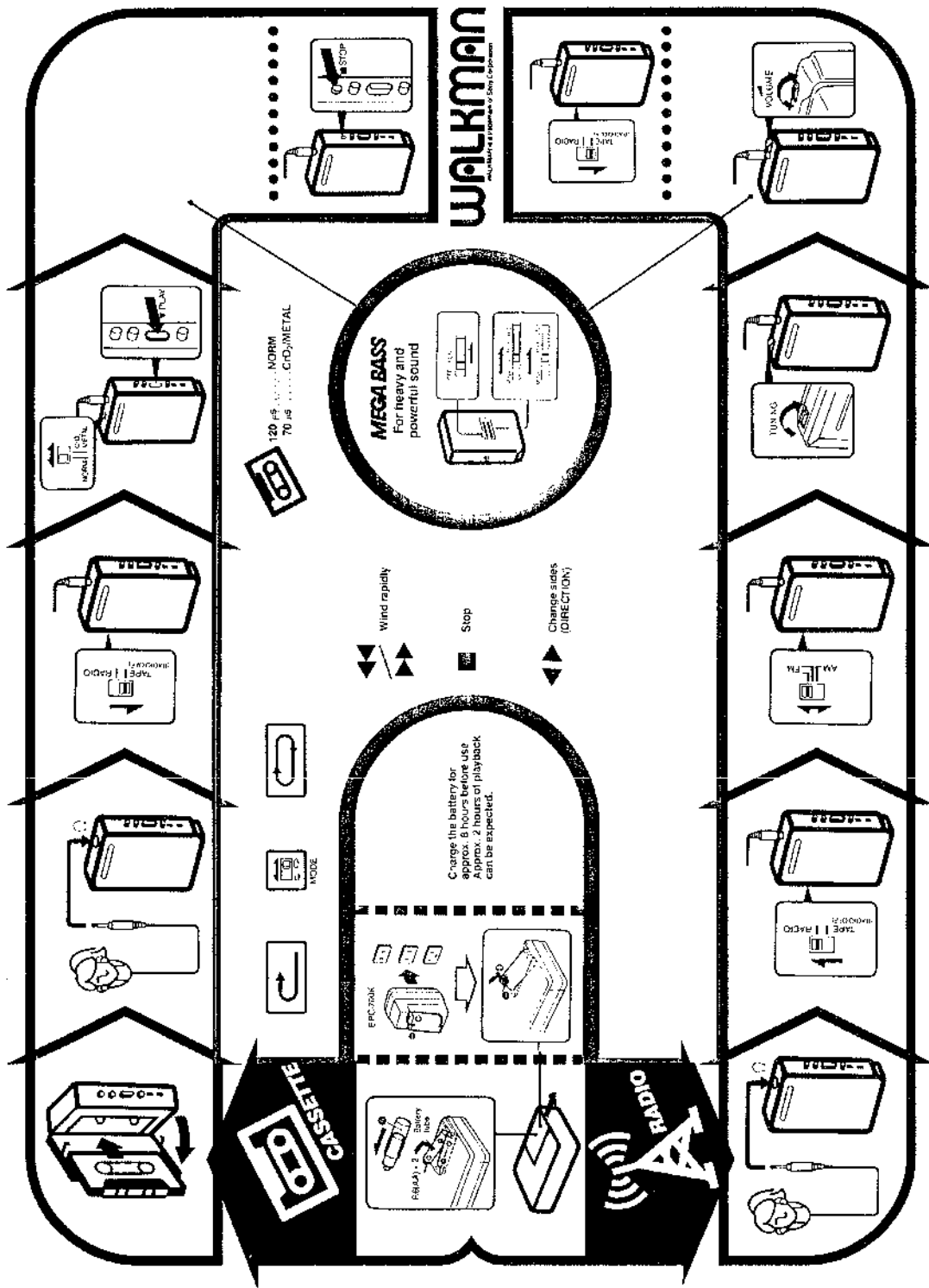
Accessories supplied

Stereo headphones (open-air type, 1) Beltclip (1)
Battery tube (1)

RADIO CASSETTE PLAYER
SONY®



SECTION 1 GENERAL



Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

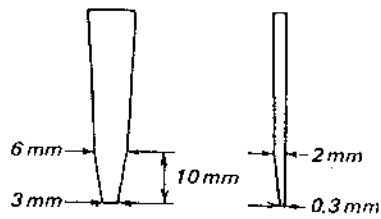
Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

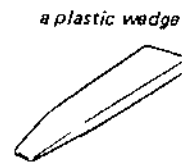
SECTION 2 DISASSEMBLY

2-1. DISASSEMBLY

- Note:**
- Follow the disassembly procedure in the numerical order given.
 - It is recommended to prepare a plastic wedge shown below for rear cabinet removal. (Using a precision screwdriver for a plastic wedge may flaw the cabinet face.)



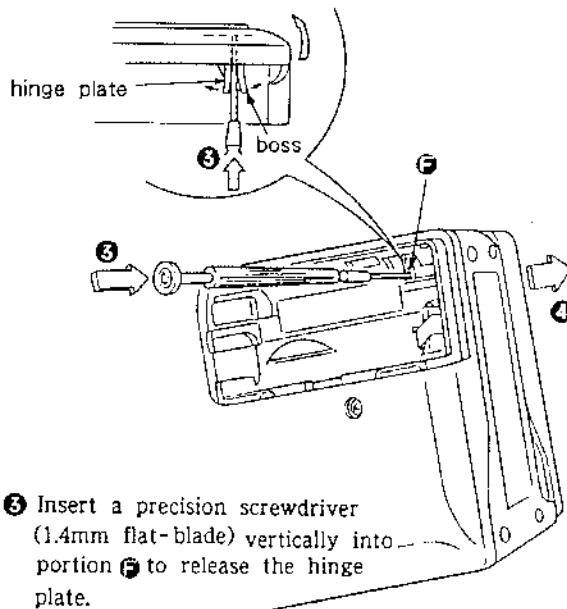
(same material as the cabinet or softer.)



- Dimensions are for a reference.

CASSETTE HOLDER

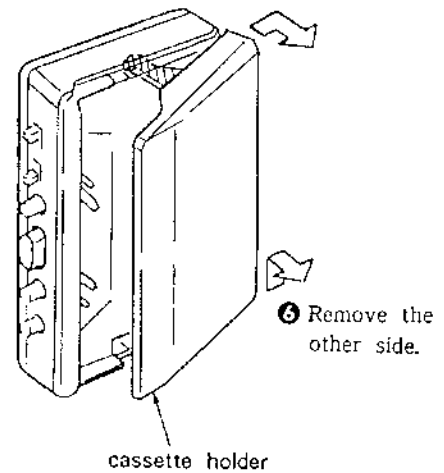
- 1 Remove the battery lid.
- 2 Hold the front cabinet firmly.



- 3 Insert a precision screwdriver (1.4mm flat-blade) vertically into portion 5 to release the hinge plate.

- 4 Remove bottom side of the cassette holder slowly.

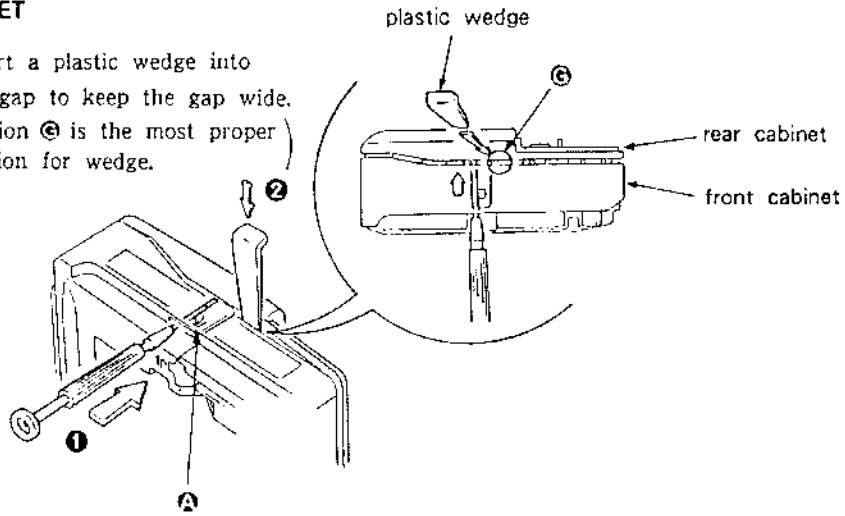
- 5 Remove hatched portion.



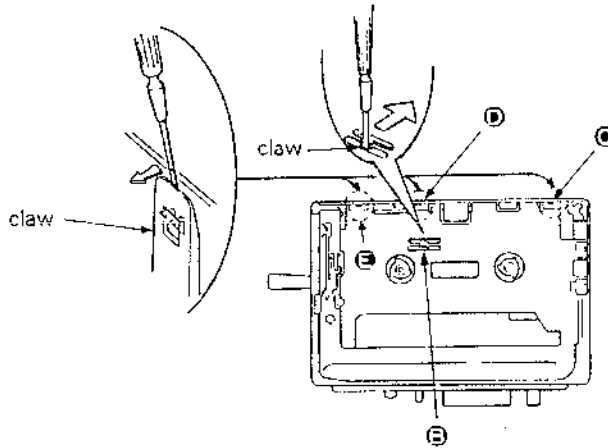
- 6 Remove the other side.

REAR CABINET

- ② Insert a plastic wedge into the gap to keep the gap wide. (Portion ③ is the most proper portion for wedge.

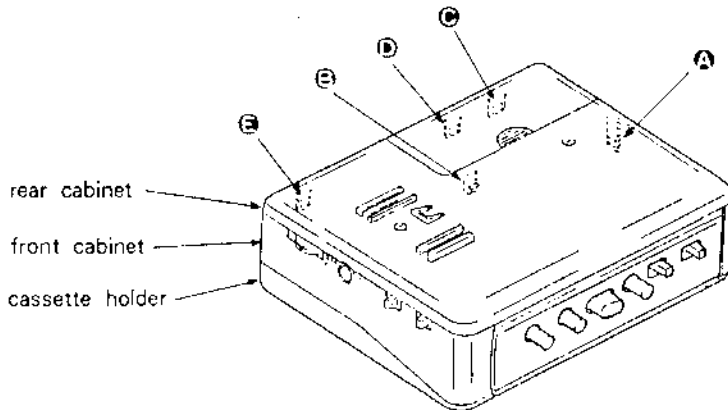


- ① Insert the screwdriver into the slit at claw A, and release the claw.



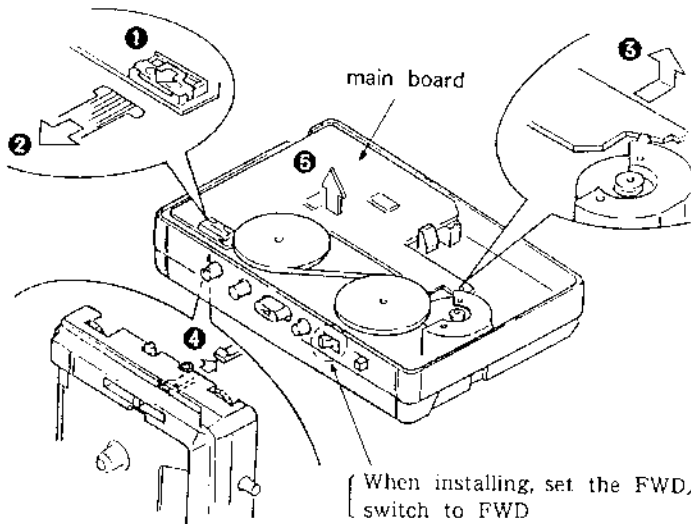
- ③ Release all claws B to E in the alphabetical order.
- ④ Remove the rear cabinet.

Location and Shape of Claws.

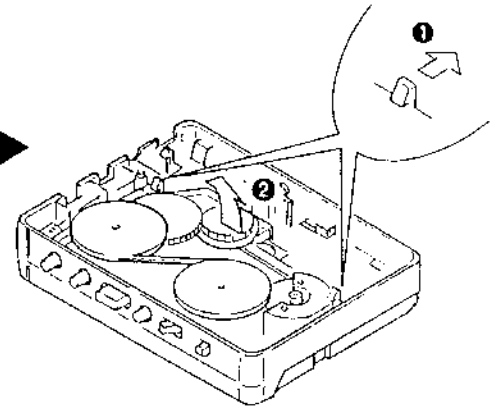


A to E: claws

MAIN BOARD

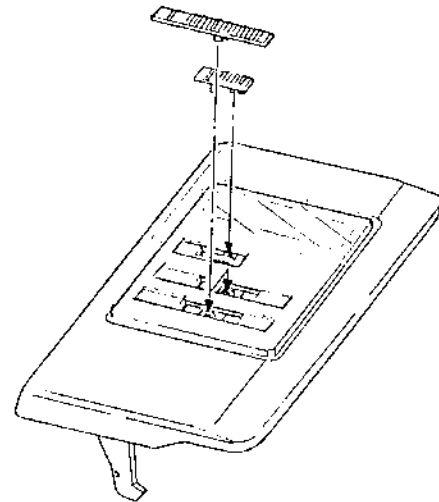
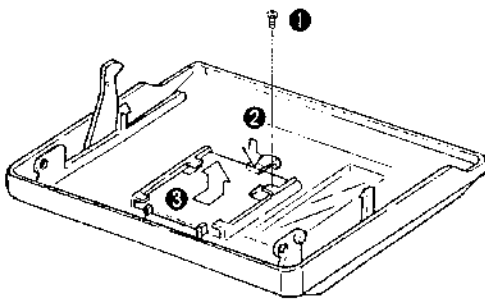


MECHANISM DECK

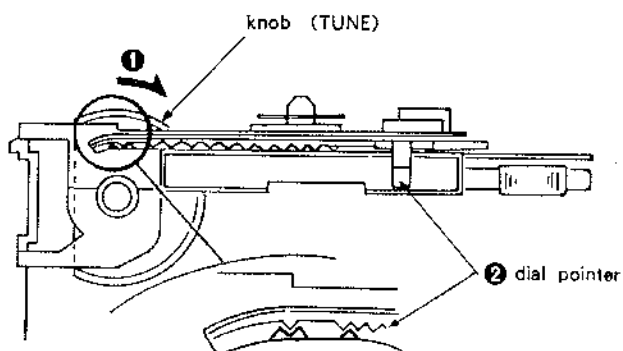


DBB UNIT

(caution on installing)



2-2. DIAL POINTER SETTING

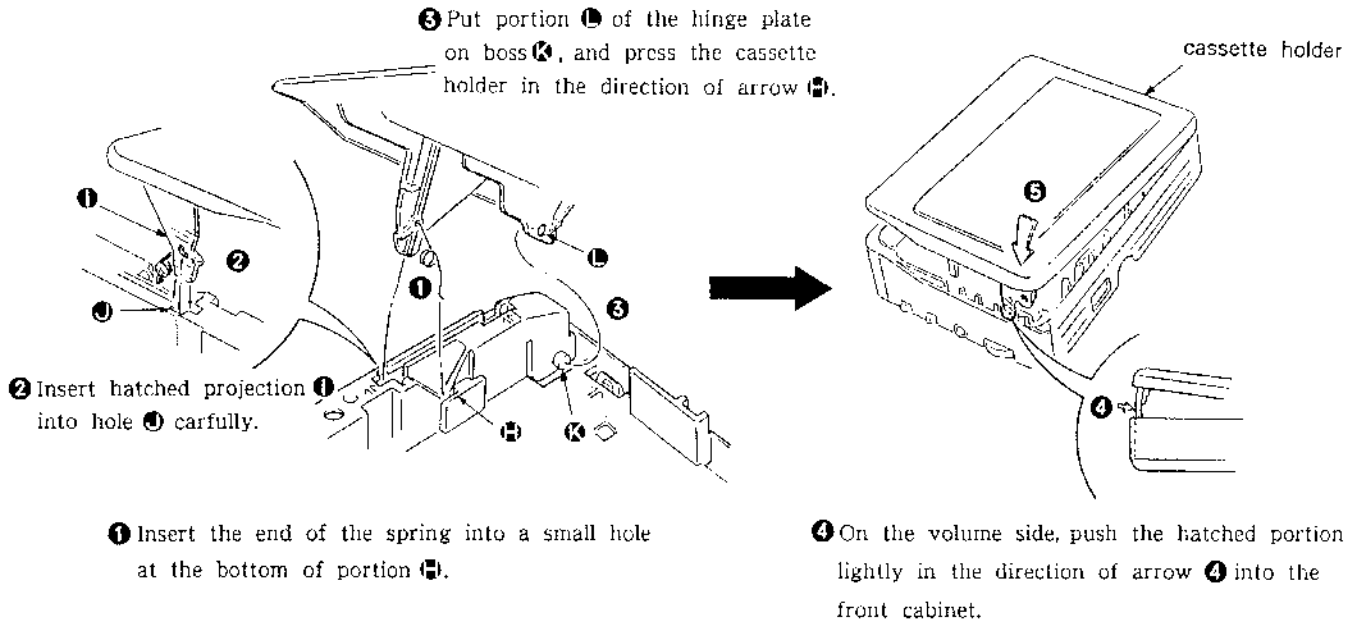


- ① Turn the knob (TUNE) fully in the direction shown by arrow.
- ② Set the dial pointer so that ▽ portion of the dial pointer coincides to △△ portion of the knob (TUNE).

2 - 3. ASSEMBLY

CASSETTE HOLDER

5 Depress the cassette holder against the front cabinet a little hard as shown by arrow 5.



SECTION 3
ADJUSTMENTS

3 - 1. MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured alcohol moistened swab:

playback head	pinch roller
capstan	rubber belts
2. Demagnetize the playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage (2.5V) unless otherwise noted.

Torque Measurement

Mode	Torque meter	Meter reading
FWD	CQ-102C	20-35 g·cm (0.28-0.48 oz·inch)
FWD Back Tension		less than 3 g·cm (less than 0.04 oz·inch)
REV	CQ-102RB	20-35 g·cm (0.28-0.48 oz·inch)
REV Back Tension		less than 3 g·cm (less than 0.04 oz·inch)
FF, REW	CQ-201B	more than 60 g·cm (more than 0.83 oz·inch)

Tape Tension Measurement

Mode	Tension meter	Meter reading
FWD	CQ-403A	more than 65 g (more than 2.3 oz)
REV	CQ-403R	

SECTION 4
DIAGRAMS

3-2. ELECTRICAL ADJUSTMENTS

PRECAUTION

- Supplied voltage : 2.5V
- Switch and control position
SENS/BAND switch : FM DX
TAPE switch : NORM
VOLUME control : maximum

CASSETTE SECTION

FUNCTION switch: TAPE

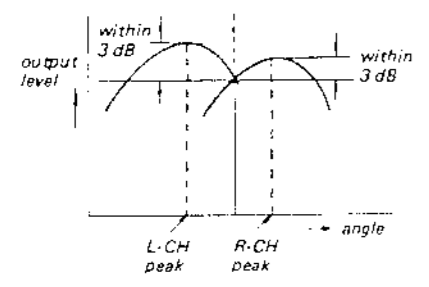
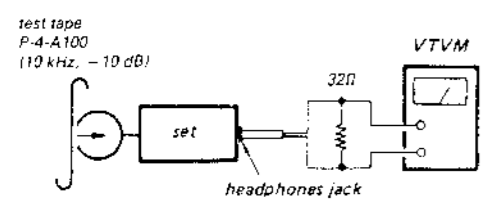
TEST TAPE

Type	Signal	Used for
WS-48A	3 kHz, 0 dB	Tape Speed Adjustment
P-4-A100	10 kHz, 10 dB	Playback Head Azimuth check

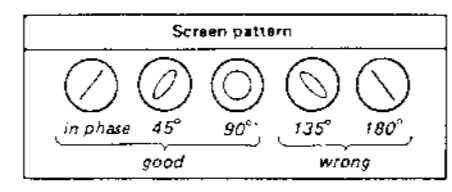
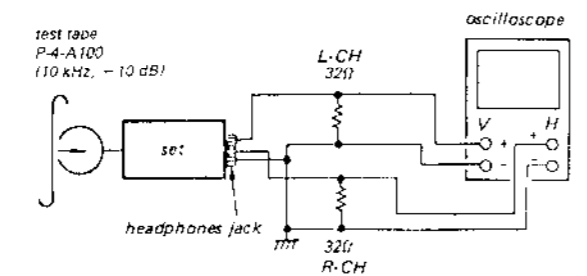
PLAYBACK HEAD AZIMUTH CHECK

- Perform this check both in FWD and REV mode.
- Note: This set is not featured the head azimuth adjustment.
When replacing the head, check the both L-ch and R-ch output levels and also those phases.

Procedure:
1. Level Check
Mode: playback

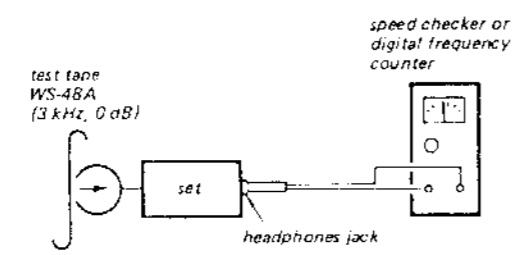


2. Phase Check
Mode: playback



TAPE SPEED ADJUSTMENT

Procedure:
Mode: playback

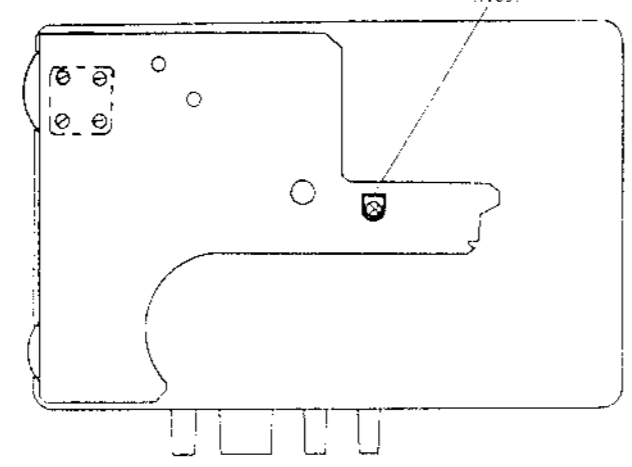


Specification:

speed checker	digital frequency counter
±1%	2,970 - 3,030 Hz

Frequency difference between the beginning and the end of the tape should be within ±2.5% (±75 Hz)

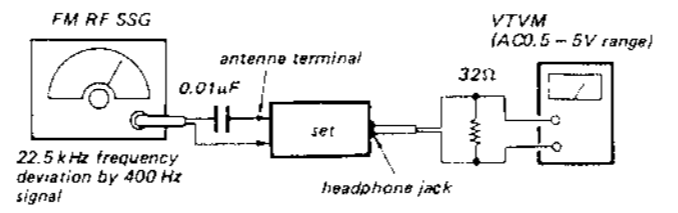
Adjustment Location: main board.



RADIO SECTION

• FUNCTION switch: TAPE

FM SECTION



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

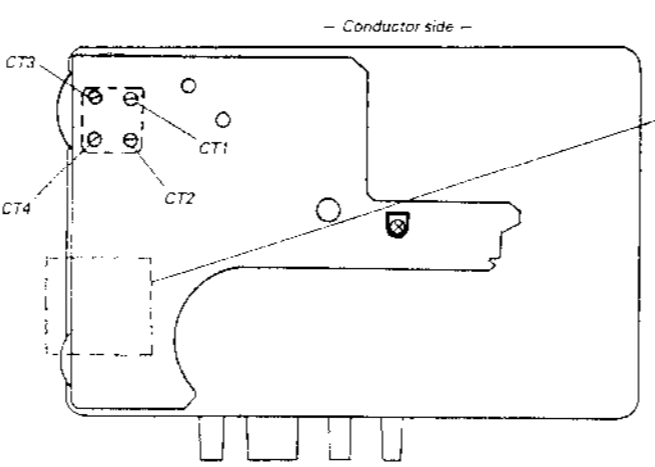
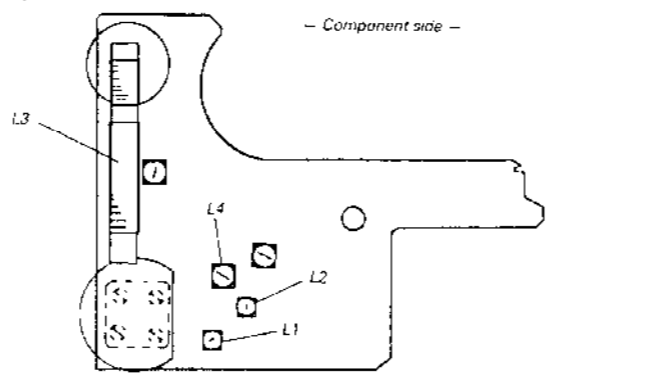
FM Frequency Coverage Adjustment

Pointer position	SG frequency	Adjustment part	Reading on VTVM
f minimum	87 MHz	L2	maximum
f maximum	109.5 MHz	CT2	

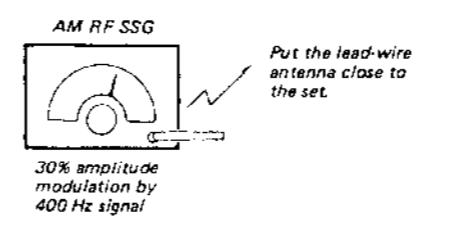
FM Tracking Adjustment

SG and set frequency	Adjustment part	Reading on VTVM
87 MHz	L1	maximum
109.5 MHz	CT1	

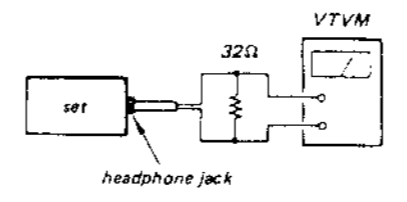
Adjustment Location: main board.



AM SECTION



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

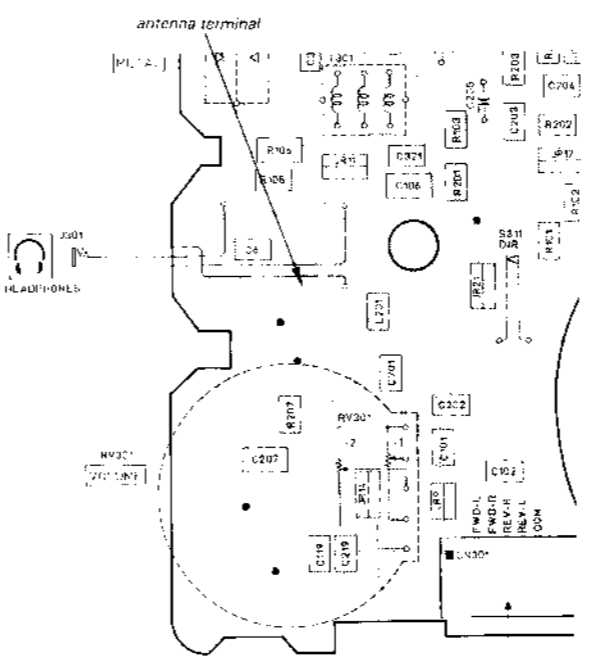


AM Frequency Coverage Adjustment

Pointer position	SG frequency	Adjustment part	Reading on VTVM
f minimum	525 kHz	L4	maximum
f maximum	1,720 kHz	CT4	

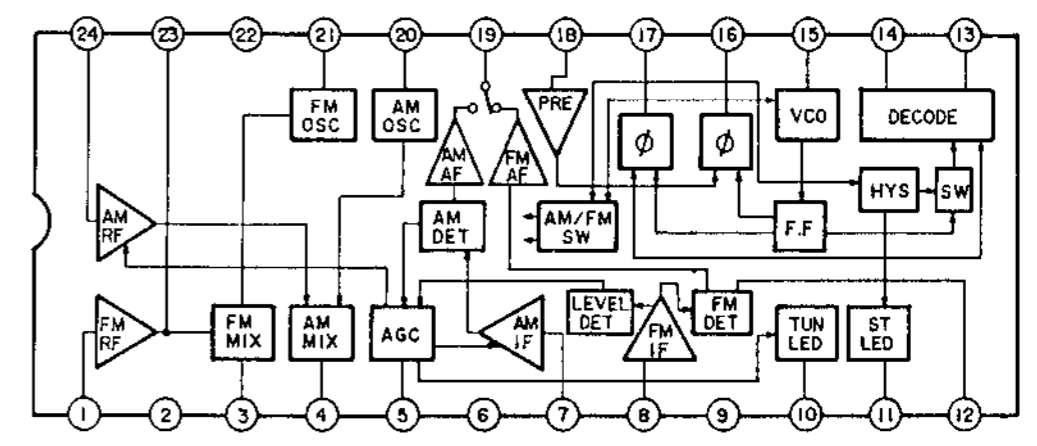
AM Tracking Adjustment

SG and set frequency	Adjustment part	Reading on VTVM
600 kHz	L3	maximum
1,400 kHz	CT3	

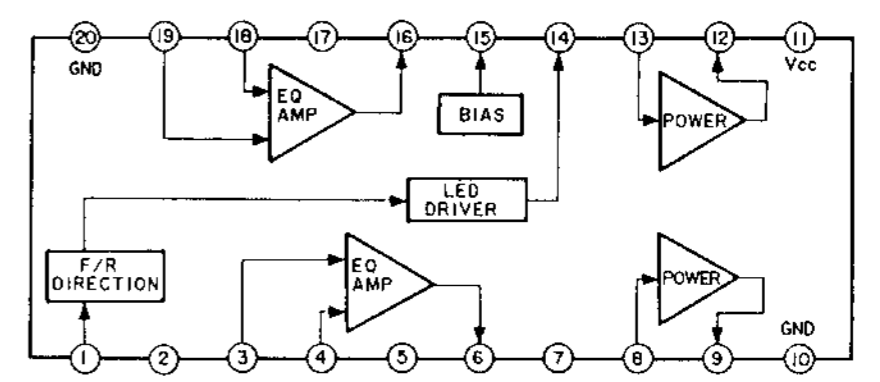


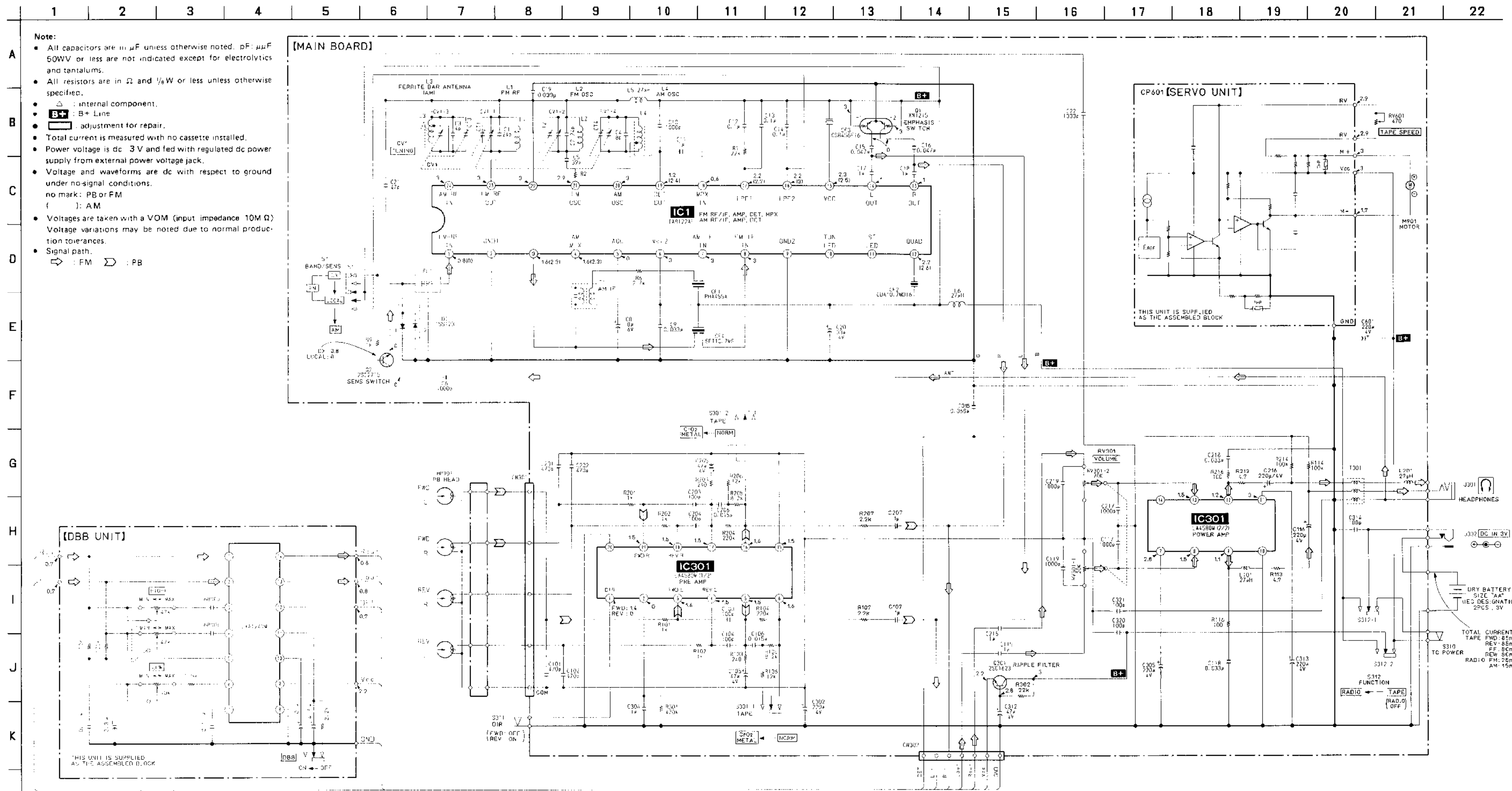
4-1. IC BLOCK DIAGRAMS

TA8122AF



LA4580M

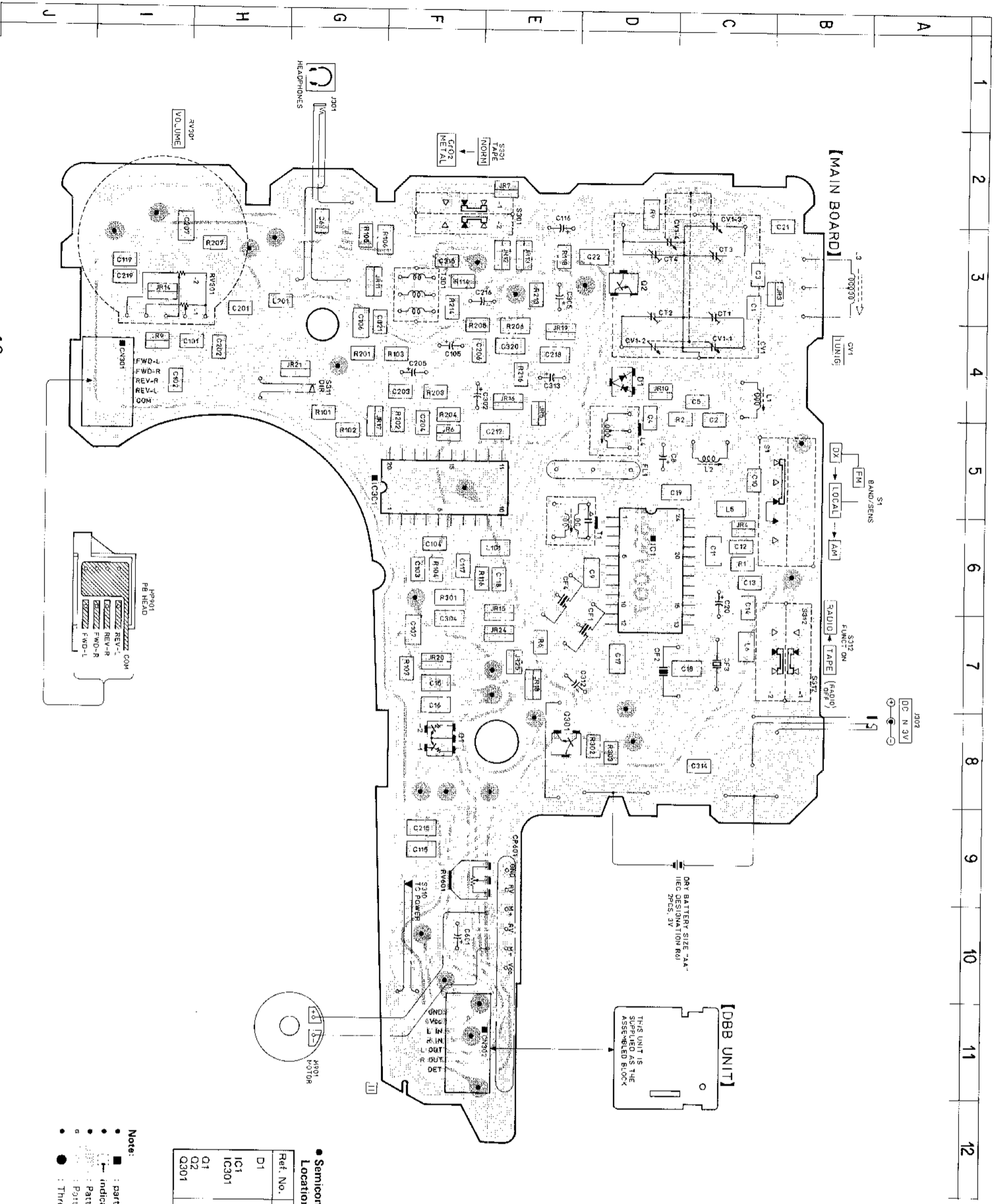




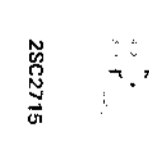
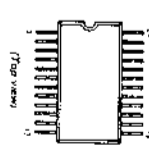
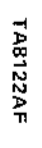
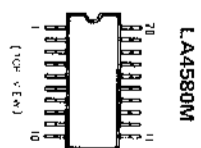
- Note:**
- All capacitors are in μF unless otherwise noted. pF: μF 50WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $\frac{1}{8}\text{W}$ or less unless otherwise specified.
 - △ : internal component.
 - B+ : B+ Line
 - ⊠ : adjustment for repair.
 - Total current is measured with no cassette installed.
 - Power voltage is dc 3V and fed with regulated dc power supply from external power voltage jack.
 - Voltage and waveforms are dc with respect to ground under no-signal conditions.
 - no mark: PB or FM
 - (): AM
 - Voltages are taken with a VOM (input impedance 10M Ω)
 - Voltage variations may be noted due to normal production tolerances.
 - Signal path.
 - : FM ⊠ : PB

DRY BATTERY
SIZE "AA"
(IEC DESIGNATION R03
2PCS, 3V)

TOTAL CURRENT
TAPE FWD: 85mA
REV: 85mA
FF: 85mA
REW: 85mA
RADIO FM: 25mA
AM: 15mA



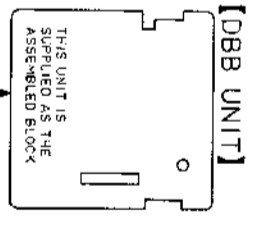
● Semiconductor Lead Layouts



● Semiconductor Location

Ref. No.	Location
D1	D-4
IC1	D-6
IC301	F-5
Q1	F-8
Q2	D-3
Q301	E-8

- Note:
- : parts mounted on the conductor side.
 - : indicates side identified with part number.
 - : Pattern on the side which is seen.
 - : Pattern of the rear side.
 - : Through hole.



DRY BATTERY SIZE "AA"
REC. DESIGNATION R01
2PCS. 3V

SECTION 5 EXPLODED VIEWS

NOTE:

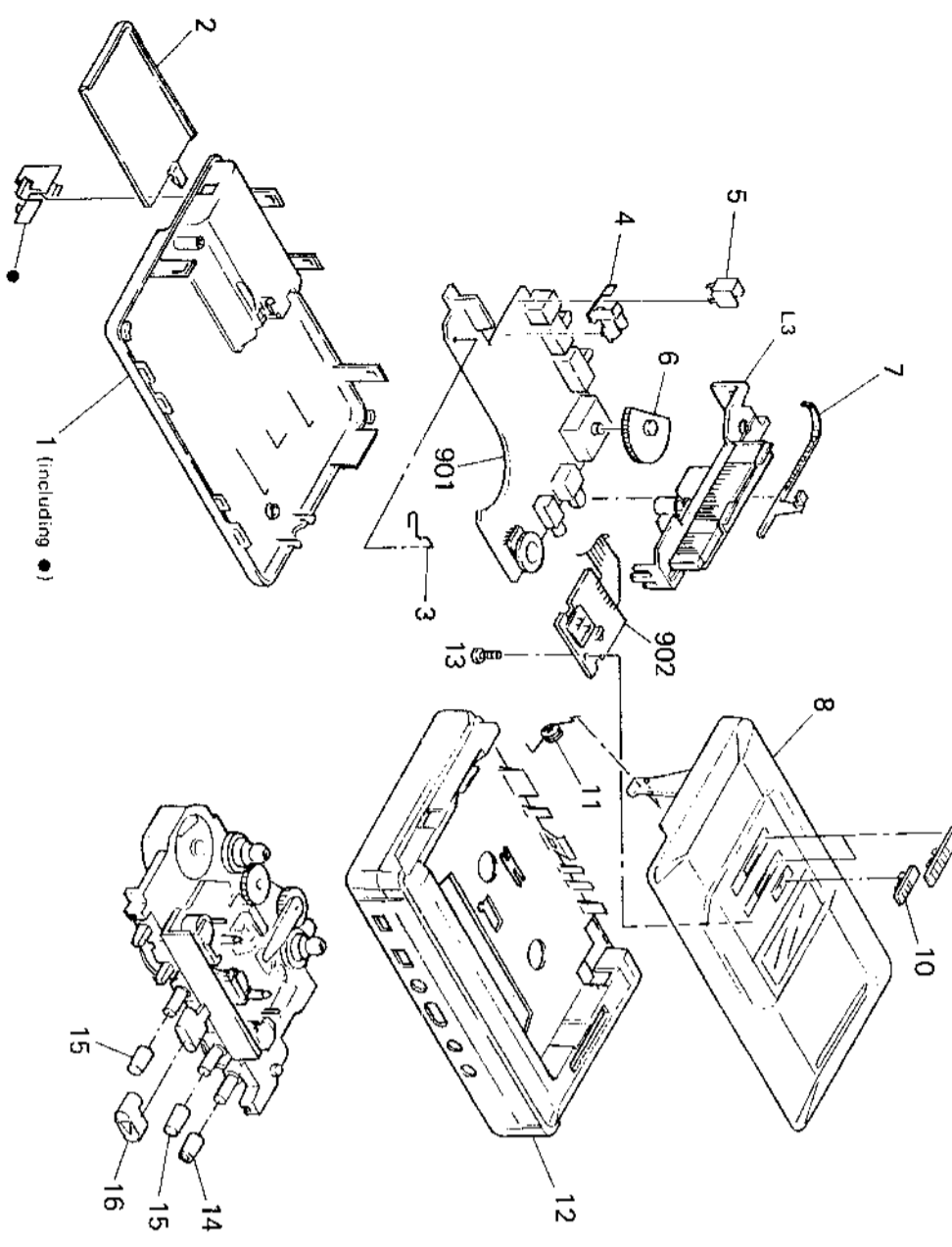
- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color indication of Appearance Parts Example: KNOB, BALANCE (WHITE) (RED) ... Cabinet's Color Part's Color

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ ou traitillés pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

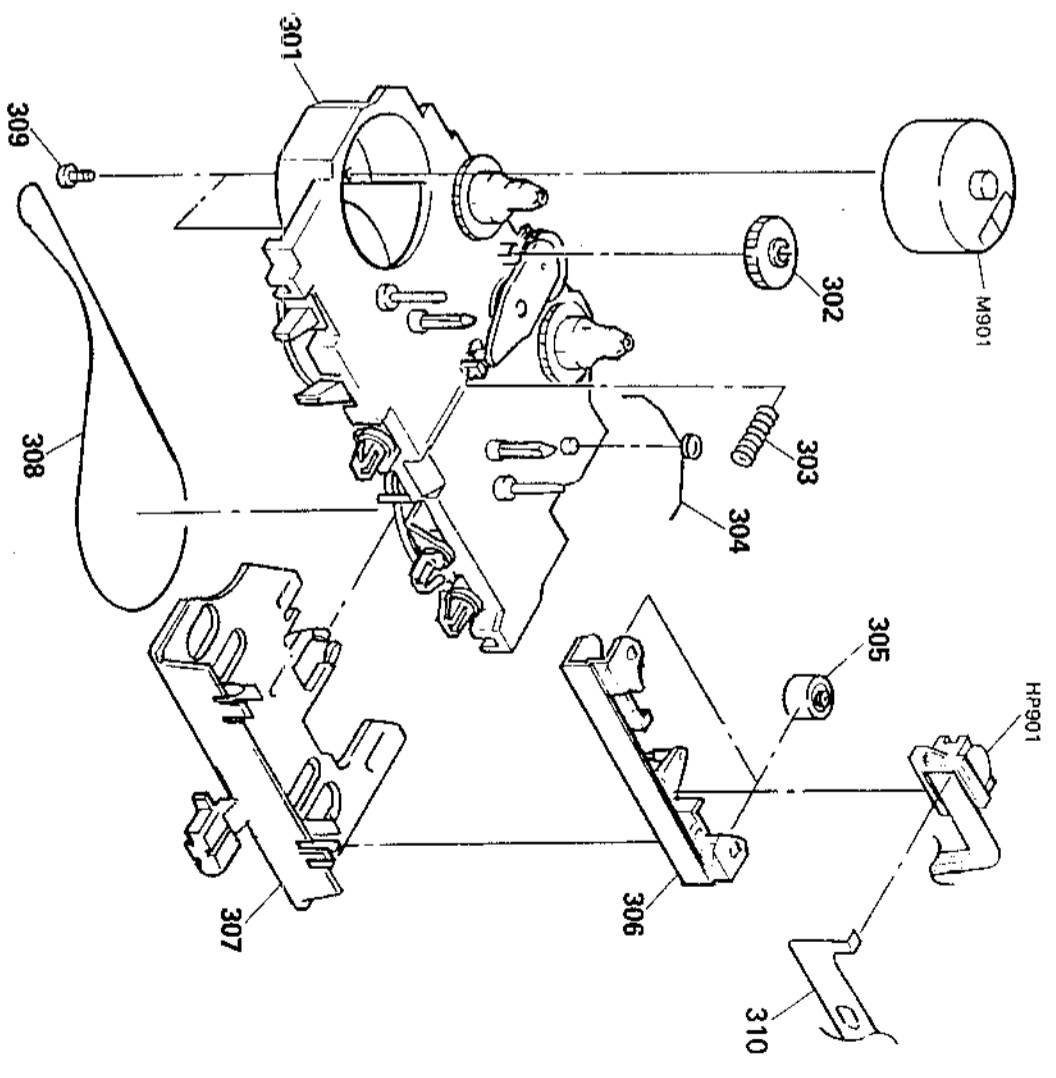
5-1.



No.	Part No.	Description	Remarks
1	X-3346-722-1	CABINET (REAR) (CF) ASSY	
2	3-351-535-01	LID, BATTERY CASE	
3	3-351-739-11	SPRING	
4	3-351-531-01	TERMINAL BOARD (M), BATTERY	
5	3-351-530-01	TERMINAL BOARD (P), BATTERY	
6	3-351-536-01	KNOB (TU)	
7	3-351-537-01	PACK, POINTER	
8	X-3346-736-1	HOLDER (CF-C) ASSY, CASSETTE	
9	3-351-534-01	KNOB (SLIDE)	
10	3-351-533-01	KNOB (DBB)	
11	3-351-523-01	SPRING, TORSION	

No.	Part No.	Description	Remarks
12	X-3346-742-1	CABINET (FRONT) (CF) ASSY (H)	
	X-3346-743-1	CABINET (FRONT) (CF) ASSY (C)	
13	3-318-382-61	SCREW (1.7X2.5), TAPPING	
14	3-351-529-11	BUTTON (S)	
15	3-351-528-11	BUTTON (FR)	
16	3-351-527-11	BUTTON (P)	
901	A-3270-561-A	PC BOARD ASSY, MAIN	
902	1-466-101-21	DBB UNIT	
L3	1-402-415-21	ANTENNA, FERRITE-ROD (AM)	

5-2. MECHANISM DECK (MT-WMA26-19)



No.	Part No.	Description	Remarks
301	X-3346-795-1	CHASSIS SUB ASSY	
302	3-351-597-01	GEAR (R)	
303	3-351-715-01	SPRING, COMPRESSION	
304	3-351-710-01	SPRING (PREVENTION), TORSION	
305	3-352-737-01	PINCH ROLLER	
306	3-351-732-01	PINCH LEVER	

No.	Part No.	Description	Remarks
307	3-351-733-01	LEVER, PLAY	
308	3-351-599-11	BELT	
309	7-627-852-38	SCREW, PRECISION +P1.7X1.8 TYPE3	
310	*3-351-792-01	PAPER, SHIELD	
HP901	1-543-596-11	HEAD, MAGNETIC (PLAYBACK)	
M901	1-541-648-11	MOTOR, DC	

SECTION 6

ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:MF: μ F, PF: μ PF.**RESISTORS**

- All resistors are in ohms.
- F: nonflammable

COILS

- MMH: mH, UH: μ H

SEMICONDUCTORS

In each case, U: μ , for example:
 UA...: μ A..., UPA...: μ PA...,
 UPC...: μ PC, UPD...: μ PD...

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description				Ref.No.	Part No.	Description			
901	A-3270-561-A	PC BOARD ASSY, MAIN				C217	1-163-205-00	CERAMIC CHIP 0.001MF	10%	50V	
902	1-466-101-21	DSB UNIT				C218	1-163-074-00	CERAMIC CHIP 0.033MF		50V	
C1	1-163-102-00	CERAMIC CHIP 24PF	5%	50V		C219	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C2	1-162-641-11	CERAMIC CHIP 24PF	5%	50V		C302	1-124-434-00	ELECT 220MF	20%	4V	
C3	1-163-087-00	CERAMIC CHIP 4PF	0.25PF	50V		C304	1-162-638-11	CERAMIC CHIP 1MF		16V	
C4	1-163-091-00	CERAMIC CHIP 8PF	0.25PF	50V		C305	1-124-434-00	ELECT 220MF	20%	4V	
C5	1-163-241-11	CERAMIC CHIP 39PF	5%	50V		C312	1-124-432-00	ELECT 47MF	20%	4V	
C6	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V		C313	1-124-434-00	ELECT 220MF	20%	4V	
C8	1-126-157-11	ELECT 10MF	20%	15V		C314	1-163-117-00	CERAMIC CHIP 100PF	5%	50V	
C9	1-163-074-00	CERAMIC CHIP 0.033MF		50V		C315	1-163-036-00	CERAMIC CHIP 0.068MF		50V	
C10	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V		C320	1-163-181-00	CERAMIC CHIP 100PF	5%	50V	
C11	1-162-638-11	CERAMIC CHIP 1MF		16V		C321	1-163-117-00	CERAMIC CHIP 100PF	5%	50V	
C12	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V		C601	1-124-434-00	ELECT 220MF	20%	4V	
C13	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V		CF1	1-567-090-00	FILTER, CERAMIC			
C14	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V		CF2	1-577-354-61	FILTER, CERAMIC			
C15	1-163-075-00	CERAMIC CHIP 0.047MF	10%	25V		CF3	1-577-091-11	OSCILLATOR, CRYSTAL (19kHz)			
C16	1-163-075-00	CERAMIC CHIP 0.047MF	10%	25V		CF4	1-577-354-61	FILTER, CERAMIC			
C17	1-162-638-11	CERAMIC CHIP 1MF		16V		CN301	*1-565-370-11	HOUSING, CONNECTOR 5P			
C18	1-162-638-11	CERAMIC CHIP 1MF		16V		CN302	*1-565-380-11	HOUSING, CONNECTOR 7P			
C19	1-163-074-00	CERAMIC CHIP 0.033MF		50V		CP601	1-466-100-11	SERVO UNIT			
C20	1-124-431-00	ELECT 33MF	20%	4V		CV1	1-151-636-11	CAP, VAR, POLYETHYLENE (including C11-1, CV1-4)(TUNING)			
C21	1-163-109-00	CERAMIC CHIP 47PF	5%	50V		D1	8-719-800-76	DIODE 1SS226			
C22	1-163-205-00	CERAMIC CHIP 0.001MF	10%	50V		FL1	1-236-169-11	FILTER, BAND PASS			
C101	1-163-133-00	CERAMIC CHIP 470PF	10%	50V		HP901	1-543-596-11	HEAD, MAGNETIC (PLAYBACK)			
C102	1-163-133-00	CERAMIC CHIP 470PF	10%	50V		IC1	8-759-230-39	IC TA8122AF			
C103	1-163-117-00	CERAMIC CHIP 100PF	5%	50V		IC301	8-759-820-66	IC LA4580M			
C104	1-163-117-00	CERAMIC CHIP 100PF	5%	50V		J301	1-565-287-31	JACK (HEADPHONES)			
C105	1-124-432-00	ELECT 47MF	20%	4V		J302	1-565-286-11	JACK, OUTER POWER (DC IN 3V)			
C106	1-163-061-00	CERAMIC CHIP 0.015MF	10%	50V		JR3	1-216-295-00	METAL GLAZE 0 5% 1/10W			
C107	1-162-638-11	CERAMIC CHIP 1MF		16V		JR5	1-216-295-00	METAL GLAZE 0 5% 1/10W			
C115	1-162-638-11	CERAMIC CHIP 1MF		16V		JR6	1-216-295-00	METAL GLAZE 0 5% 1/10W			
C116	1-124-434-00	ELECT 220MF	20%	4V		JR7	1-216-295-00	METAL GLAZE 0 5% 1/10W			
C117	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V		JR9	1-216-295-00	METAL GLAZE 0 5% 1/10W			
C118	1-163-034-00	CERAMIC CHIP 0.033MF		50V		JR10	1-216-295-00	METAL GLAZE 0 5% 1/10W			
C119	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V		JR11	1-216-296-00	METAL GLAZE 0 5% 1/8W			
C201	1-163-133-00	CERAMIC CHIP 470PF	10%	50V		JR12	1-216-296-00	METAL GLAZE 0 5% 1/8W			
C202	1-163-133-00	CERAMIC CHIP 470PF	10%	50V		JR13	1-216-296-00	METAL GLAZE 0 5% 1/8W			
C203	1-163-117-00	CERAMIC CHIP 100PF	5%	50V		JR14	1-216-296-00	METAL GLAZE 0 5% 1/8W			
C204	1-163-117-00	CERAMIC CHIP 100PF	5%	50V		JR15	1-216-296-00	METAL GLAZE 0 5% 1/8W			
C205	1-124-432-00	ELECT 47MF	20%	4V		JR16	1-216-296-00	METAL GLAZE 0 5% 1/8W			
C206	1-163-023-00	CERAMIC CHIP 0.015MF	10%	50V							
C207	1-162-638-11	CERAMIC CHIP 1MF		16V							
C215	1-162-638-11	CERAMIC CHIP 1MF		16V							
C216	1-124-434-00	ELECT 220MF	20%	4V							

Ref.No.	Part No.	Description
JR17	1-216-296-00	METAL GLAZE 0 5% 1/8W
JR18	1-216-296-00	METAL GLAZE 0 5% 1/8W
JR19	1-216-296-00	METAL GLAZE 0 5% 1/8W
JR20	1-216-296-00	METAL GLAZE 0 5% 1/8W
JR21	1-216-296-00	METAL GLAZE 0 5% 1/8W
JR24	1-216-296-00	METAL GLAZE 0 5% 1/8W
JR25	1-216-295-00	METAL GLAZE 0 5% 1/10W
L1	1-459-950-11	COIL (WITH CORE) (RF)(FM)
L2	1-459-959-11	COIL (WITH CORE) (OSC)(FM)
L3	1-402-415-21	ANTENNA, FERITE-ROD (AM)
L4	1-406-332-11	COIL (OSC)(AM)
L5	1-410-209-51	INDUCTOR CHIP 27UH
L6	1-410-209-51	INDUCTOR CHIP 27UH
L101	1-410-209-51	INDUCTOR CHIP 27UH
L201	1-412-011-31	INDUCTOR CHIP 27UH
M901	1-541-648-11	MOTOR, DC
Q1	8-729-403-17	TRANSISTOR XN1215
Q2	8-729-201-26	TRANSISTOR 2SC2715
Q301	8-729-100-66	TRANSISTOR 2SC1623
R1	1-216-081-00	METAL GLAZE 22K 5% 1/10W
R2	1-216-017-00	METAL GLAZE 47 5% 1/10W
R6	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W
R9	1-216-198-00	METAL GLAZE 1K 5% 1/8W
R101	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R102	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R103	1-216-034-00	METAL GLAZE 240 5% 1/10W
R104	1-216-105-00	METAL GLAZE 220K 5% 1/10W
R105	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W
R106	1-216-224-00	METAL GLAZE 12K 5% 1/8W
R107	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W
R113	1-216-308-00	METAL GLAZE 4.7 5% 1/10W
R114	1-216-097-00	METAL GLAZE 100K 5% 1/10W
R116	1-216-025-00	METAL GLAZE 100 5% 1/10W
R201	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R202	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R203	1-216-034-00	METAL GLAZE 240 5% 1/10W
R204	1-216-105-00	METAL GLAZE 220K 5% 1/10W
R205	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W
R206	1-216-224-00	METAL GLAZE 12K 5% 1/8W
R207	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W
R213	1-216-308-00	METAL GLAZE 4.7 5% 1/10W
R214	1-216-097-00	METAL GLAZE 100K 5% 1/10W
R216	1-216-025-00	METAL GLAZE 100 5% 1/10W
R301	1-216-262-00	METAL GLAZE 470K 5% 1/8W
R302	1-216-081-00	METAL GLAZE 22K 5% 1/10W
R303	1-216-308-00	METAL GLAZE 4.7 5% 1/10W

Ref.No.	Part No.	Description
RV301	1-238-490-11	RES, VAR, CARBON 20K/20K (VOLUME)
RV601	1-238-237-11	RES, ADJ, CERMET 470 (TAPE SPEED)
S1	1-570-660-11	SWITCH, SLIDE (BAND/SENS)
S301	1-571-478-11	SWITCH, SLIDE (TAPE)
S310	1-571-859-21	SWITCH, LEAF (TC POWER)
S311	1-571-859-11	SWITCH, LEAF (DIR)
S312	1-571-478-11	SWITCH, SLIDE (FUNCTION)
T1	1-404-793-11	TRANSFORMER, IF (AM)
T301	1-409-461-11	COIL, TRAP

ACCESSORY & PACKING MATERIAL

*3-342-930-11	STOPPER
3-346-518-01	CLIP, BELT
3-351-508-01	TUBE, PROTECTION
*3-351-552-01	CUSHION (UPPER)
*3-351-553-01	CUSHION (LOWER)
*3-351-569-01	(Canadian)...INDIVIDUAL CARTON
3-750-071-11	(Canadian)...MANUAL, INSTRUCTION
3-750-071-22	(US).....MANUAL, INSTRUCTION
8-952-260-92	MDR-W10L/1 SET
8-952-260-92	HEADPHONE MDR-W10L//K SET